

**ENVIRONMENTAL, SOCIAL, AND GOVERNANCE
DISCLOSURE AND BANK FINANCIAL PERFORMANCE IN
INDONESIA: THE MODERATING ROLE OF FIRM SIZE
(2020-2024)**

Oleh
Ekklesia Evangelion
223020302252

JURNAL ILMIAH

Untuk memperoleh gelar Sarjana
Jurusan/Prodi Manajemen
Bidang Konsentrasi Manajemen Keuangan



**KEMENTERIAN PENDIDIKAN TINGGI, SAINS, DAN TEKNOLOGI
UNIVERSITAS PALANGKA RAYA
FAKULTAS EKONOMI DAN BISNIS
JURUSAN MANAJEMEN
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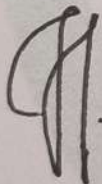
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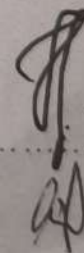
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ENVIRONMENTAL, SOCIAL, AND GOVERNANCE
DISCLOSURE AND BANK FINANCIAL PERFORMANCE IN
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(2020-2024)

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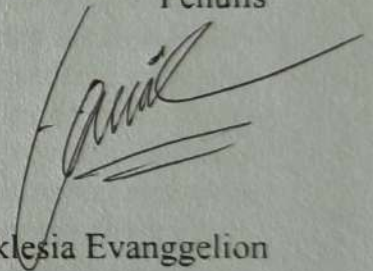
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Penulis



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ENVIRONMENTAL, SOCIAL, AND GOVERNANCE DISCLOSURE AND BANK FINANCIAL PERFORMANCE IN INDONESIA: THE MODERATING ROLE OF FIRM SIZE (2020–2024)



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ABSTRACT

This study examines whether Environmental, Social, and Governance (ESG) disclosure is associated with the financial performance of Indonesian listed banks during the 2020–2024 period and whether firm size moderates this relationship. The research adopts a quantitative explanatory approach, where ESG disclosure is measured using a disclosure index developed through content analysis of annual and sustainability reports. Financial performance is represented by several indicators, including return on assets, return on equity, net profit margin, and earnings per share. The findings indicate that the direct effects of individual ESG disclosure dimensions on financial performance are generally weak and not consistently evident across different performance indicators. Meanwhile, firm size shows a more stable relationship with financial performance in several model specifications. When the moderating effect is considered, the relationship between ESG disclosure and financial performance appears more conditional, suggesting that the financial relevance of ESG practices may depend on specific bank characteristics. This study is limited by a relatively small sample size and the use of disclosure-based ESG measurement. Future research is recommended to expand the sample coverage, extend the observation period, and incorporate alternative ESG measurement approaches to provide more comprehensive insights into the relationship between ESG practices and financial performance.

Keywords: ESG Disclosure; Banking Sector; Financial Performance; Firm Size Moderation; Indonesia Stock Exchange

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INTRODUCTION

Environmental, Social, and Governance (ESG) has become a central framework for evaluating corporate sustainability, accountability, and long term resilience (Huang, 2021; Narula et al., 2024; Pereira & Martins, 2021). ESG disclosure, commonly communicated through annual reports, sustainability reports, or integrated reports, provides stakeholders with structured information about a firm's environmental management, social responsibility, and governance practices (Arvidsson & Dumay, 2022; Firmansyah et al., 2023). In capital markets, ESG disclosure is frequently treated as decision relevant information because it can strengthen transparency, reduce information asymmetry, and support stakeholder monitoring, particularly for investors and regulators (Arvidsson & Dumay, 2022; Onjewu et al., 2023). As sustainability considerations increasingly influence risk assessment and capital allocation, ESG disclosure is expected to play a more material role in shaping how firms are evaluated (Maji & Lohia, 2023; Narula et al., 2024).

In the ASEAN region, sustainability reporting expectations have intensified through both regulatory developments and market initiatives. In Indonesia, sustainable finance has been promoted by the Financial Services Authority, and the stock exchange has introduced ESG related instruments, including the IDX ESG Leaders Index (Fujianti et al., 2024; Kartika et al., 2023). Despite these developments, ESG reporting practices in Indonesia still face challenges, such as uneven disclosure quality, limited comparability across firms, and differences in organizational capacity to implement and report ESG programs (Kartika et al., 2023; Purnomo et al., 2023). These constraints indicate that ESG disclosure may not carry uniform informational value across issuers, which creates a practical concern for stakeholders attempting to interpret ESG signals consistently.

The Indonesian banking sector provides a relevant context to examine these issues. Banks operate under relatively strict regulatory oversight and play a pivotal role in sustainable finance through financial intermediation, including the allocation of capital to economic activities with environmental and social implications. Banking is also a trust sensitive industry, where credibility and transparency can shape stakeholder confidence and perceived stability (Husada & Handayani, 2021). However, ESG disclosure among listed banks still varies in breadth and consistency, including among highly visible institutions (Kartika et al., 2023). This variation raises a research problem regarding whether differences in ESG disclosure are associated with differences in banks' financial performance within the Indonesian capital market setting (Firmansyah et al., 2023; Maji & Lohia, 2023).

Prior empirical evidence on the relationship between ESG disclosure and financial performance remains mixed, particularly in emerging markets where disclosure maturity, enforcement intensity, and implementation costs differ across firms and over time. Some studies report positive associations between ESG disclosure and profitability or firm value, while others find negative or statistically insignificant relationships, implying that ESG may become financially relevant only under certain conditions or institutional environments (Huang, 2021; Maji & Lohia, 2023; Al-ahdal et al., 2023; Narula et al., 2024). In Indonesia, findings also remain inconclusive, with evidence suggesting that ESG may not always translate into improved financial outcomes or may require governance related mechanisms to become financially meaningful (Husada & Handayani, 2021; Arofah & Khomsiyah, 2023). This inconsistency constitutes a research gap that warrants context specific testing focused on Indonesia's listed banking sector, using

multiple profitability proxies and a design that can evaluate potential boundary conditions.

Firm size is a plausible boundary condition because it reflects visibility, resource capacity, and exposure to stakeholder scrutiny (Ahmad et al., 2023; Mahajan et al., 2023). Larger banks typically possess stronger financial and organizational resources to implement sustainability programs and produce more systematic reporting, while also facing higher monitoring, compliance, and reputational pressures. These conditions can influence both the level of ESG disclosure and its potential financial consequences, either through efficiency gains and reputational benefits or through higher implementation and compliance costs (Ahmad et al., 2023; Fujianti et al., 2024). Therefore, firm size may strengthen or weaken the relationship between ESG disclosure dimensions and financial performance, which is particularly relevant in the banking sector, where size is closely related to systemic importance and regulatory attention.

Accordingly, this study aims to examine the effects of Environmental Disclosure, Social Disclosure, and Governance Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange during 2020–2024, with firm size as a moderating variable. Financial performance is assessed using Return on Assets, Return on Equity, Net Profit Margin, and Earnings per Share. ESG disclosure is operationalized through a structured disclosure index derived from company reports and analyzed using baseline and moderation specifications to evaluate both direct and conditional relationships. The study is expected to strengthen empirical understanding of ESG disclosure in emerging market banking and provide practical implications for regulators, investors, and bank management regarding disclosure quality, transparency, and competitiveness in sustainable finance.

LITERATURE REVIEW, RESEARCH FRAMEWORK, AND HYPOTHESES

Stakeholder Theory

Stakeholder theory explains that banks must be accountable to multiple stakeholder groups, not only shareholders (Mahajan et al., 2023). ESG disclosure can reduce information asymmetry and strengthen stakeholder trust, which may support financial performance through reputation and stakeholder support (Arvidsson & Dumay, 2022; Sciarrelli et al., 2021).

Legitimacy Theory

Legitimacy theory posits that firms maintain operations by aligning with societal norms and sustainability expectations (Akhter et al., 2023). ESG disclosure functions as a legitimacy mechanism that may reduce reputational risk and strengthen acceptance under increasing sustainable finance pressures (Hamm et al., 2022; Kartika et al., 2023).

Agency Theory

Agency theory highlights conflicts and information gaps between owners and managers. Disclosure serves as a monitoring tool that can reduce agency costs (Santoso et al., 2022). Governance disclosure is especially relevant because it signals internal control and oversight quality. This mechanism may support performance in regulated financial institutions (Onjewu et al., 2023).

Triple Bottom Line (TBL)

TBL views firm success as the integration of economic, environmental, and social outcomes (Pereira & Martins, 2021). ESG disclosure reflects this integration and may

contribute to financial performance when sustainability practices are embedded in strategy rather than treated as symbolic reporting (Shim et al., 2021).

Signaling Theory

Signaling theory suggests firms disclose information to reduce uncertainty and convey quality to investors (Handoko, 2021). ESG disclosure can act as a signal of long term orientation and risk governance, which may shape investor confidence and financial outcomes (Arvidsson & Dumay, 2022).

Political Cost Theory

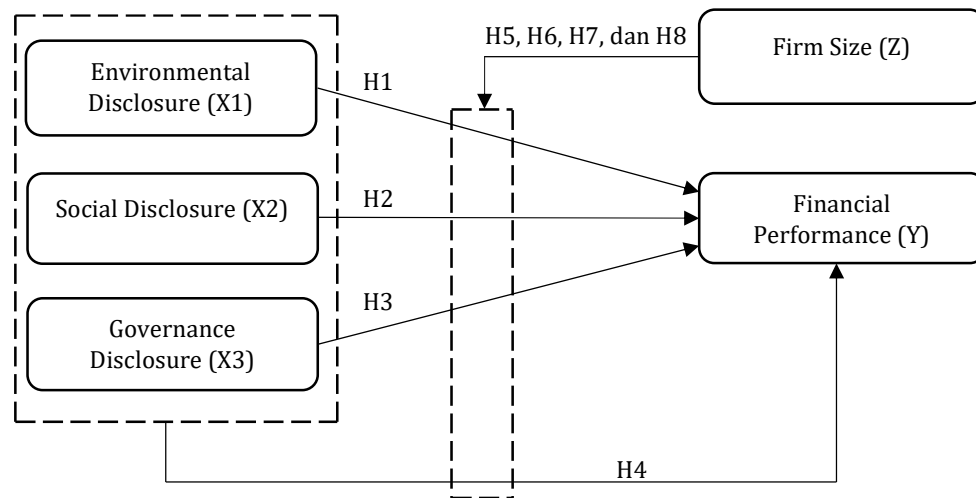
Political cost theory argues that larger, more visible firms face stronger regulatory and public scrutiny. Therefore, they have incentives to disclose more in order to manage political and regulatory pressure (Al-ahdal et al., 2023). This logic supports firm size as a potential moderator of the ESG performance relationship (Fujianti et al., 2024).

Resource-Based View (RBV)

RBV emphasizes that performance depends on unique internal resources and capabilities (Alkaraan et al., 2022). Larger banks typically possess greater resources to implement and report ESG programs more substantively. This capacity can strengthen the performance relevance of ESG disclosure (Fujianti et al., 2024; Narula et al., 2024).

Research Framework

Based on the theoretical perspectives and empirical findings discussed in the previous section, this study develops a conceptual research framework to examine the relationship between ESG disclosure, firm size, and financial performance, as illustrated in Figure 1.



Source: Adapted from Firmansyah et al., (2023)

Figure 1
Research Framework

This study adopts the conceptual logic used by (Firmansyah et al., 2023) by positioning Environmental Disclosure, Social Disclosure, and Governance Disclosure as explanatory variables that may influence banks' financial performance. Financial

performance is captured using ROA, ROE, NPM, and EPS to represent profitability, operational efficiency, margin strength, and shareholder oriented outcomes. The framework also incorporates firm size as a moderating variable because it reflects differences in internal resources (resource based view), external scrutiny and legitimacy pressure (legitimacy theory), stakeholder breadth (stakeholder theory), and political and regulatory exposure (political cost theory). These factors may strengthen or weaken the relationship between ESG disclosure and financial performance.

Hypotheses

Environmental disclosure reflects how banks communicate policies, initiatives, and outcomes related to environmental management and sustainability practices. Such disclosure provides stakeholders with information regarding how organizations address environmental risks and responsibilities within their operations (Arvidsson & Dumay, 2022; Firmansyah et al., 2023). From stakeholder and legitimacy perspectives, credible environmental disclosure can strengthen stakeholder confidence and social acceptance. Transparent environmental reporting signals organizational responsibility and responsiveness to societal expectations, which may enhance corporate reputation and support long-term business sustainability (Mahajan et al., 2023). In industries that rely heavily on public trust, such as banking, strengthened legitimacy and stakeholder confidence may contribute to improved financial outcomes (Akhter et al., 2023). Therefore, environmental disclosure is expected to positively influence financial performance by enhancing legitimacy, stakeholder trust, and the credibility of sustainability commitments.

H1: Environmental Disclosure positively affects the financial performance of banks listed on the Indonesia Stock Exchange.

Social disclosure indicates transparency regarding employee welfare, occupational health and safety, human capital development, consumer responsibility, and community engagement. This form of disclosure reflects how organizations communicate their social responsibility practices to stakeholders (Arvidsson & Dumay, 2022; Firmansyah et al., 2023). Stronger social disclosure can enhance corporate reputation and stakeholder support. When organizations demonstrate responsibility toward employees, customers, and communities, stakeholders may respond with greater trust and engagement. Such positive stakeholder relationships can reduce relational frictions and operational risks, thereby supporting more stable operations and potentially improving profitability (Huang, 2021; Maji & Lohia, 2023). Accordingly, social disclosure is expected to contribute positively to the financial performance of banking institutions.

H2: Social Disclosure positively affects the financial performance of banks listed on the Indonesia Stock Exchange.

Governance disclosure signals the extent to which banks communicate oversight structures, internal controls, ethical standards, and accountability mechanisms to stakeholders. Such transparency helps stakeholders evaluate the effectiveness of corporate governance systems and managerial accountability (Ahmad et al., 2023; Arvidsson & Dumay, 2022). Agency theory suggests that stronger governance transparency can reduce information asymmetry between managers and stakeholders, constrain opportunistic behavior, and improve the quality of strategic decision-making. These governance mechanisms are particularly important in highly regulated sectors

such as banking, where effective monitoring and accountability are essential for maintaining institutional credibility (Al-ahdal et al., 2023; Narula et al., 2024). Therefore, greater governance disclosure is expected to strengthen financial performance by improving transparency, accountability, and stakeholder confidence.

H3: Governance Disclosure positively affects the financial performance of banks listed on the Indonesia Stock Exchange.

ESG disclosure is inherently multidimensional, encompassing environmental, social, and governance dimensions that collectively reflect a firm's sustainability orientation. The financial relevance of one dimension may depend on the consistency and integration of the other dimensions (Huang, 2021; Narula et al., 2024). ESG disclosure may represent a coherent sustainability strategy and organizational capability rather than fragmented reporting practices. When organizations communicate ESG practices in a consistent and integrated manner, stakeholders may perceive the firm's sustainability commitments as more credible and strategically aligned. This coherence can strengthen stakeholder trust and enhance the credibility of risk management practices (Ahmad et al., 2023; Maji & Lohia, 2023). Thus, integrated ESG disclosure may contribute positively to financial performance. credibility.

H4: Integrated ESG Disclosure positively affects the financial performance of banks listed on the Indonesia Stock Exchange.

Firm size may influence whether environmental disclosure becomes financially material. Larger firms generally face stronger public scrutiny and regulatory expectations, which encourage more extensive environmental disclosure practices (Ahmad et al., 2023; Al-ahdal et al., 2023). Large banks typically possess greater financial and organizational resources to implement environmental initiatives and sustainability reporting systems. However, these institutions may also face higher implementation and compliance costs associated with environmental management, which can influence short-term financial outcomes (Kartika et al., 2023; Narula et al., 2024). Therefore, firm size may moderate the relationship between environmental disclosure and financial performance.

H5: Firm size moderates the effect of Environmental Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange.

The benefits of social disclosure may vary depending on organizational scale and stakeholder visibility. Larger banks interact with broader stakeholder groups and face stronger expectations regarding social responsibility and transparency (Huang, 2021; Mahajan et al., 2023). Consequently, credible social disclosure by large banks may generate stronger reputational benefits and stakeholder support. In contrast, smaller banks may experience resource constraints that limit the scope and consistency of social reporting (Maji & Lohia, 2023). Thus, firm size may influence the strength of the relationship between social disclosure and financial performance.

H6: Firm size moderates the effect of Social Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange.

As organizational size increases, operational complexity and agency problems may also intensify. Larger organizations often face more complex governance structures and greater monitoring demands (Al-ahdal et al., 2023). To address these challenges, large banks may rely more heavily on governance mechanisms and disclosure practices

to maintain transparency and credibility under heightened regulatory and stakeholder scrutiny. At the same time, the costs associated with governance compliance may also increase (Ahmad et al., 2023; Narula et al., 2024). Accordingly, firm size may moderate the relationship between governance disclosure and financial performance.

H7: Firm size moderates the effect of Governance Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange.

Integrated ESG disclosure may be more financially relevant in larger banks that possess the institutional capacity to embed ESG practices within their organizational strategy and governance systems (Huang, 2021). Larger banks often face stronger scrutiny from regulators, investors, and the public, which can amplify both the benefits and trade-offs associated with ESG implementation. When ESG practices are effectively institutionalized and communicated through integrated disclosure, the resulting credibility may enhance stakeholder trust and corporate reputation (Maji & Lohia, 2023; Narula et al., 2024). Thus, firm size may influence the strength of the relationship between integrated ESG disclosure and financial performance.

H8: Firm size moderates the effect of Integrated ESG Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange.

METHOD

This study applies a quantitative, causal explanatory design to examine the effects of Environmental Disclosure, Social Disclosure, and Governance Disclosure on the financial performance of Indonesian listed banks, with firm size as a moderating variable. The study focuses on banks included in the IDX ESG Leaders Index during 2020–2024, using full year observations. The unit of analysis is the firm year, resulting in balanced panel observations for each sampled bank across five years.

The population comprises all banking firms listed in the IDX ESG Leaders Index during the observation period. The sample is determined using purposive sampling with the following criteria: the bank is consistently included in the IDX ESG Leaders Index during 2020–2024; annual reports, sustainability reports, or both are available for each year; audited financial statement data are complete to compute ROA, ROE, NPM, and EPS; and the bank does not experience delisting or major corporate restructuring that materially disrupts data comparability. All banks meeting these criteria are included, resulting in a final sample of 10 banks observed over five years, yielding 50 firm year observations. Because the study covers all eligible banks within the index and period, sample size determination follows a full coverage approach rather than a statistical power based estimation.

Data are collected from secondary sources. ESG disclosure data are obtained through document based content analysis of annual reports and sustainability reports, while financial variables are derived from audited financial statements published through the Indonesia Stock Exchange and official issuer disclosures. ESG disclosure is measured using a structured binary checklist consisting of 15 indicators, comprising 5 environmental, 5 social, and 5 governance indicators. Each indicator is coded 1 if disclosed and 0 otherwise, and each dimension score is computed as the proportion of disclosed items within the corresponding dimension, with values ranging from 0 to 1. Financial performance is proxied by Return on Assets, Return on Equity, Net Profit Margin, and Earnings per Share, while firm size is measured as the natural logarithm of total assets.

Data analysis is conducted using moderated regression analysis to test both direct and conditional relationships between ESG disclosure and financial performance. This approach allows the examination of both the direct effects of ESG dimensions and the moderating role of firm size within the same empirical framework (Ahmad et al., 2023; Al-ahdal et al., 2023). The baseline model estimates the effects of Environmental, Social, and Governance disclosure on financial performance, while the moderation model adds firm size and interaction terms between each disclosure dimension and firm size. Prior to statistical inference, several diagnostic tests were conducted to evaluate the assumptions underlying regression analysis, including multicollinearity, residual distribution, heteroskedasticity, and autocorrelation.

These diagnostic procedures are commonly applied in empirical studies examining the relationship between ESG disclosure and firm performance to ensure the robustness and reliability of regression estimates (Huang, 2021; Narula et al., 2024). Specifically, residual normality was assessed using the Shapiro–Wilk test, heteroskedasticity was evaluated using the Glejser test, autocorrelation patterns were described using the Durbin–Watson statistic, and multicollinearity was assessed using variance inflation factors. In addition, a robustness check was performed using bootstrap-based inference with bias-corrected and accelerated (BCa) 95% confidence intervals for ESG_TOTAL and its interaction with firm size to strengthen the reliability of the statistical results ((Maji & Lohia, 2023; Narula et al., 2024). Statistical analyses are performed using IBM SPSS Statistics version 23.

RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistics are used to summarize and describe the basic characteristics of the variables included in a study. This analysis provides an overview of the data distribution by presenting measures such as minimum values, maximum values, means, and standard deviations, which help researchers understand the general patterns and variability of the observed variables (D. Z. X. Huang, 2021; R. Narula et al., 2024). In studies examining environmental, social, and governance (ESG) disclosure and firm performance, descriptive statistics also help illustrate the overall tendencies of ESG reporting practices and financial indicators before conducting further statistical analysis.

Table 1 presents the descriptive statistics for all variables used in this study, including Environmental Disclosure (ED), Social Disclosure (SD), Governance Disclosure (GD), the composite ESG score (ESG_TOTAL), financial performance indicators (ROA, ROE, NPM, and EPS), and firm size measured using the natural logarithm of total assets.

Table 1
Descriptive Statistics (N = 50)

Variable	N	Min	Max	Mean	Std. Dev.
ED	50	2.00	5.00	4.48	0.839
SD	50	1.00	5.00	4.72	0.834
GD	50	2.00	5.00	4.80	0.639
ESG_TOTAL	50	7.00	15.00	14.00	1.852
ROA	50	-8.52	8.41	1.898	2.287
ROE	50	-15.07	29.88	12.037	7.501
NPM	50	-206.90	50.64	21.495	35.134
EPS	50	-17.11	1101.07	296.370	268.642
FIRM_SIZE_LN	50	7.69	14.70	12.670	1.721

Source: Processed data, 2025

Table 1 reports the descriptive statistics for all study variables ($N = 50$). Overall, ESG disclosure scores are relatively high, with mean values close to the upper end of the measurement scale for Environmental Disclosure ($ED = 4.48$), Social Disclosure ($SD = 4.72$), and Governance Disclosure ($GD = 4.80$). The aggregated ESG measure also indicates high disclosure intensity, with a mean of 14.00 and a range of 7–15.

In contrast, financial performance indicators exhibit substantial heterogeneity across banks and years. ROA ranges from -8.52 to 8.41 , with a mean of 1.898 , while ROE ranges from -15.07 to 29.88 , with a mean of 12.037 . Dispersion is particularly pronounced for NPM, which ranges from -206.90 to 50.64 (mean = 21.495), and EPS, which ranges from -17.11 to 1101.07 (mean = 296.370). These values indicate that profitability outcomes differ markedly across observations. Firm size also varies meaningfully, with a mean of 12.670 and a range of 7.69 – 14.70 , supporting its role as a contextual factor and a potential moderator in subsequent models.

Classical Assumption Tests and Model Diagnostics

Residual Normality

Residual normality refers to the assumption that the residuals (error terms) of a regression model are normally distributed. This assumption is important because many statistical inference procedures in regression analysis rely on the normal distribution of residuals to ensure the validity and reliability of hypothesis testing results (Huang, 2021; Narula et al., 2024). When residuals are normally distributed, the estimated regression coefficients and associated statistical tests are considered more robust and unbiased. To evaluate this assumption, the Shapiro–Wilk test was employed. The Shapiro–Wilk test examines whether the distribution of residuals significantly deviates from a normal distribution. The decision rule is based on the significance value (p-value): if the p-value is greater than 0.05, the residuals are considered normally distributed, whereas a p-value lower than 0.05 indicates a deviation from normality (Maji & Lohia, 2023).

Table 2 summarizes the results of the Shapiro–Wilk normality test for the residual series generated from the regression models used in this study.

Table 2
Normality of Residuals (Shapiro–Wilk Summary)

Item	Result
Number Of Residual Series Tested	17
Residual Series With P Value < 0.05	15
Conclusion	Residual Normality Is Not Fully Satisfied

Source: Processed data, 2025

Residual normality was assessed using the Shapiro–Wilk test across 17 residual series. Of these, 15 series produce p values below 0.05, indicating that the normality assumption is not satisfied for most model specifications. This diagnostic suggests that strict OLS based inference that relies on normally distributed residuals should be interpreted cautiously. Accordingly, the results are discussed by emphasizing coefficient direction, significance patterns, and complementary evidence from diagnostic checks and robustness oriented analyses.

Heteroskedasticity (Glejser Test)

Heteroskedasticity refers to a condition in regression analysis where the variance of the error terms is not constant across observations. In classical linear regression, one of the key assumptions is homoskedasticity, meaning that the variance of the residuals remains constant for all levels of the independent variables. When heteroskedasticity occurs, the estimated regression coefficients remain unbiased but the standard errors may become inefficient, which can lead to unreliable statistical inference and hypothesis testing (Alkaraan et al., 2022; Sciarelli et al., 2021). To detect the presence of heteroskedasticity, this study applies the Glejser test. In this procedure, the absolute values of the regression residuals are regressed on the independent variables. If the independent variables significantly explain the absolute residual values, heteroskedasticity is indicated. The decision rule is based on the significance level of the regression coefficients: a p-value greater than 0.05 indicates the absence of heteroskedasticity, whereas a p-value lower than 0.05 suggests the presence of heteroskedasticity in the model (Akhter et al., 2023; Al-ahdal et al., 2023).

The results of the heteroskedasticity test using the Glejser method for each regression model are presented in Table 3.

Table 3
Heteroskedasticity Test (Glejser), Significant Predictors ($p < 0.05$)

Dependent Variable	Significant Predictor	P Value
ROA	Zscore(ED)	0.036
ROA	Zscore(SD)	0.032
ROA	ZEDxZSIZE	0.001
ROA	ZSDxZSIZE	0.014
ROA	ZGDxZSIZE	0.029
ROE	ZEDxZSIZE	0.025
NPM	Zscore(SD)	0.024
NPM	ZEDxZSIZE	0.002
NPM	ZSDxZSIZE	0.024
NPM	ZGDxZSIZE	0.016
EPS	None	

Source: Processed data, 2025

The Glejser test provides evidence of heteroskedasticity in multiple specifications, particularly for ROA and NPM. For the ROA model, significant predictors include Zscore(ED) ($p = 0.036$) and Zscore(SD) ($p = 0.032$). Heteroskedasticity is also indicated by significant interaction terms, namely ZEDxZSIZE ($p = 0.001$), ZSDxZSIZE ($p = 0.014$), and ZGDxZSIZE ($p = 0.029$), suggesting that error variance is not constant in this specification.

For the ROE model, heteroskedasticity is indicated by ZEDxZSIZE ($p = 0.025$). For the NPM model, significant predictors include Zscore(SD) ($p = 0.024$) and interaction terms ZEDxZSIZE ($p = 0.002$), ZSDxZSIZE ($p = 0.024$), and ZGDxZSIZE ($p = 0.016$). By contrast, no significant Glejser predictors are detected for EPS, suggesting comparatively more stable variance in that specification.

Overall, these findings imply that heteroskedasticity may affect standard errors in several models. Therefore, the results should be interpreted with attention to consistency across specifications and supported by complementary robustness evidence.

Autocorrelation Diagnostic (Durbin–Watson)

Autocorrelation refers to a condition in regression analysis where the residuals are correlated with one another across observations. In classical linear regression models, one of the key assumptions is that the error terms are independent. When autocorrelation occurs, the residuals from one observation are systematically related to the residuals of another observation. This situation can lead to inefficient parameter estimates and biased standard errors, which may distort statistical inference in empirical research (Mahajan et al., 2023; Shim et al., 2021). To detect the presence of autocorrelation in the regression model, this study employs the Durbin–Watson (DW) statistic. The Durbin–Watson test evaluates the correlation between adjacent residuals in the regression model. The value of the Durbin–Watson statistic ranges from 0 to 4. A value close to 2 indicates that there is no autocorrelation in the residuals. A value substantially below 2 suggests positive autocorrelation, whereas a value substantially above 2 indicates negative autocorrelation (Pereira & Martins, 2021; Purnomo et al., 2023).

The Durbin–Watson statistics for each regression model in this study are summarized in Table 4.

Table 4
Durbin–Watson Statistic

Dependent Variable	Model (1)	Model (2)
ROA	1.346	0.987
ROE	1.263	1.307
NPM	1.838	1.652
EPS	1.306	1.394

Source: Processed data, 2025

Durbin–Watson statistics are reported as supplementary diagnostics to describe potential serial correlation patterns in the residuals. For ROA, the values are 1.346 for Model (1) and 0.987 for Model (2). For ROE, the corresponding values are 1.263 and 1.307. NPM records 1.838 for Model (1) and 1.652 for Model (2), while EPS shows 1.306 and 1.394. Although these statistics are not used as the primary basis for hypothesis conclusions, they provide additional context regarding residual behavior and support a cautious interpretation of coefficient inference.

Multicollinearity Diagnostic (VIF Summary)

Multicollinearity refers to a condition in regression analysis in which two or more independent variables are highly correlated with each other. When such correlations exist, it becomes difficult to distinguish the individual contribution of each explanatory variable to the dependent variable. Although multicollinearity does not bias the regression coefficients, it may increase the standard errors of the estimates and reduce the reliability of statistical inference in empirical models (Huang, 2021; Maji & Lohia, 2023). To detect multicollinearity, this study applies the Variance Inflation Factor (VIF). The VIF indicates how much the variance of an estimated regression coefficient increases because of correlations among the independent variables. A commonly applied rule of thumb suggests that a VIF value below 10 indicates that multicollinearity is not problematic, while a VIF value substantially above 10 signals a high level of multicollinearity that may affect the stability of the regression estimates (Ahmad et al., 2023; Firmansyah et al., 2023).

The summary of the multicollinearity diagnostic results for the regression models used in this study is presented in Table 5.

Table 5
Multicollinearity Diagnostic (VIF Summary)

Model	Vif Range (Reported)	Note
MODEL (1)	Approx. 1.48 to 2.08	Low multicollinearity
MODEL (2)	Increases substantially (example vif for zscore(sd) approx. 31.78)	Interaction terms may inflate VIF

Source: Processed data, 2025

Multicollinearity diagnostics indicate that Model (1) is not exposed to serious collinearity concerns, as VIF values range approximately from 1.48 to 2.08. In Model (2), VIF values increase substantially. For example, the VIF for Zscore(SD) is approximately 31.78. This inflation is commonly observed in moderated regression because interaction terms tend to increase collinearity, even when variables are standardized. Therefore, interpretation of Model (2) emphasizes sign consistency, interaction patterns, and overall model fit rather than VIF magnitude alone.

Regression Results

Regression analysis is a statistical technique used to examine the relationship between one dependent variable and several independent variables. The purpose of applying regression in empirical research is to estimate the magnitude and direction of the relationship between explanatory variables and outcome variables, as well as to determine whether these relationships are statistically significant. In studies examining environmental, social, and governance (ESG) practices, regression models are commonly used to evaluate how ESG disclosures influence corporate financial performance indicators (Huang, 2021; Narula et al., 2024).

This study estimates two regression specifications to analyze the relationship between ESG disclosures and firm financial performance. Model (1) represents the baseline model that evaluates the direct effects of Environmental Disclosure (ED), Social Disclosure (SD), Governance Disclosure (GD), and firm size on financial performance indicators. Model (2) extends the baseline specification by incorporating interaction terms between ESG disclosure variables and firm size. The inclusion of interaction variables allows the analysis to test whether firm size moderates the relationship between ESG disclosures and firm financial performance (Ahmad et al., 2023; Al-ahdal et al., 2023).

Model 1: Main Effects (ED, SD, GD, Firm Size)

Model (1) evaluates the direct relationship between ESG disclosure dimensions and firm financial performance without considering moderating effects. In this specification, ED, SD, GD, and firm size are treated as independent variables that directly influence financial performance indicators. Such baseline models are widely applied in ESG-performance research to identify whether sustainability-related disclosures have a measurable effect on corporate financial outcomes (Arvidsson & Dumay, 2022; Maji & Lohia, 2023).

The estimation results for the baseline regression model are summarized in Table 6.

Table 6
Regression Results for Model (1)

Variable	ROA	ROE	NPM	EPS
Constant	-3.123 (-1.127)	-25.278*** (-3.222)	-137.669*** (-3.715)	-957.328*** (-3.440)
ED	0.735 (1.613)	1.684 (1.305)	9.432 (1.547)	1.802 (0.039)
SD	0.445 (0.819)	1.599 (1.040)	-4.637 (-0.639)	-9.317 (-0.171)
GD	0.678 (1.016)	1.968 (1.042)	3.833 (0.430)	18.100 (0.270)
Firm_Size_Ln	-0.286 (-1.152)	1.009 (1.434)	9.502*** (2.861)	94.924*** (3.806)
Observations	50	50	50	50
R Squared	0.151	0.367	0.356	0.379
Adjusted R Squared	0.075	0.311	0.299	0.324
F Statistic	1.993	6.528	6.229	6.873
Durbin Watson	1.346	1.263	1.838	1.306

Note: values in parentheses are t statistics. Significance: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Source: Processed data, 2025

In Model (1), none of the ESG disclosure dimensions are statistically significant predictors of ROA. The coefficients are ED ($B = 0.735$; $t = 1.613$), SD ($B = 0.445$; $t = 0.819$), and GD ($B = 0.678$; $t = 1.016$). Firm size is also insignificant ($B = -0.286$; $t = -1.152$). The ROA model explains limited variance ($R^2 = 0.151$; adjusted $R^2 = 0.075$), and overall model fit is weak ($F = 1.993$). This pattern suggests that ROA variation is not well captured by these predictors in the baseline specification.

For ROE, the constant term is negative and significant ($B = -25.278$; $t = -3.222$; $p < 0.01$). However, ED ($B = 1.684$; $t = 1.305$), SD ($B = 1.599$; $t = 1.040$), GD ($B = 1.968$; $t = 1.042$), and firm size ($B = 1.009$; $t = 1.434$) remain statistically insignificant. The ROE model shows moderate fit ($R^2 = 0.367$; adjusted $R^2 = 0.311$) and is jointly significant ($F = 6.528$). This indicates that ROE is more predictable at the model level, even though individual ESG dimensions do not exhibit significant effects on their own.

For NPM, firm size is the only significant predictor ($B = 9.502$; $t = 2.861$; $p < 0.01$). In contrast, ED ($B = 9.432$; $t = 1.547$), SD ($B = -4.637$; $t = -0.639$), and GD ($B = 3.833$; $t = 0.430$) are insignificant. The model fit statistics are $R^2 = 0.356$ and $F = 6.229$.

For EPS, firm size remains strongly positive and significant ($B = 94.924$; $t = 3.806$; $p < 0.01$). Meanwhile, ED ($B = 1.802$; $t = 0.039$), SD ($B = -9.317$; $t = -0.171$), and GD ($B = 18.100$; $t = 0.270$) are insignificant. The model fit statistics are $R^2 = 0.379$ and $F = 6.873$.

Collectively, these findings suggest that firm size is more consistently associated with financial performance, particularly for NPM and EPS, than the disaggregated ESG disclosure dimensions in the baseline models.

Model 2 (Moderation Model): Interaction Effects of ESG Dimensions and Firm Size

Model (2) extends the baseline model by incorporating interaction terms between ESG disclosure variables and firm size. The purpose of including interaction variables is to evaluate whether the influence of ESG disclosures on financial performance varies depending on the size of the firm. Moderation models are commonly used in corporate governance and sustainability research to test whether firm characteristics strengthen or weaken the relationship between ESG practices and firm performance (Akhter et al., 2023; Firmansyah et al., 2023)

The regression results for the moderation model are presented in Table 7.

Table 7
Regression Results for Model (2)

Variable	ROA	ROE	NPM	EPS
CONSTANT	3.361*** (6.619)	15.462*** (9.255)	37.639*** (8.172)	271.909*** (4.238)
ED	0.482 (1.351)	1.746 (1.488)	-0.260 (-0.080)	15.984 (0.355)
SD	-1.592 (-1.112)	-4.484 (-0.952)	-12.494 (-0.963)	-2.120 (-0.012)
GD	-1.108 (-1.438)	-3.148 (-1.242)	-6.792 (-0.972)	26.932 (0.277)
Firm_Size_Ln	-0.433 (-1.060)	2.454* (1.823)	11.012*** (2.968)	173.552*** (3.358)
ZEDXZSIZE	-0.556 (-1.636)	0.107 (0.096)	-20.620*** (-6.686)	35.631 (0.829)
ZSDXZSIZE	-1.142 (-1.349)	-3.356 (-1.205)	-5.279 (-0.688)	3.474 (0.032)
ZGDxZSIZE	-1.163** (-2.085)	-3.573* (-1.948)	-4.409 (-0.872)	6.921 (0.098)
Observations	50	50	50	50
R Squared	0.483	0.479	0.820	0.401
Adjusted R Squared	0.396	0.392	0.790	0.302
F Statistic	5.597	5.522	27.259	4.022
Durbin Watson	0.987	1.307	1.652	1.394

Note: values in parentheses are t statistics. Significance: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Source: Processed data, 2025

In Model (2), moderation evidence differs across performance proxies, suggesting that conditional effects may be specific to the performance measure. For ROA, the interaction between governance disclosure and firm size is negative and significant (ZGDxZSIZE $B = -1.163$; $t = -2.085$; $p < 0.05$), indicating that the marginal association of governance disclosure with ROA weakens as firm size increases. The interaction between ED and firm size is negative but not significant (ZEDxZSIZE $B = -0.556$; $t = -1.636$). The interaction between SD and firm size is also not significant (ZSDxZSIZE $B = -1.142$; $t = -1.349$). Model fit improves relative to the baseline for ROA ($R^2 = 0.483$; adjusted $R^2 = 0.396$; $F = 5.597$), implying that including interaction terms provides additional explanatory power.

For ROE, firm size shows marginal significance ($B = 2.454$; $t = 1.823$; $p < 0.10$). The interaction between governance disclosure and firm size is also marginal and negative (ZGDxZSIZE $B = -3.573$; $t = -1.948$; $p < 0.10$), while the other interaction terms remain statistically insignificant.

For NPM, the strongest moderation effect appears in the interaction between ED and firm size, which is negative and highly significant (ZEDxZSIZE $B = -20.620$; $t = -6.686$; $p < 0.01$). Firm size also remains positive and significant ($B = 11.012$; $t = 2.968$; $p < 0.01$). This specification achieves very high explanatory power ($R^2 = 0.820$; adjusted $R^2 = 0.790$; $F = 27.259$), indicating that the moderation structure is particularly informative for NPM.

For EPS, firm size remains strongly positive and significant ($B = 173.552$; $t = 3.358$; $p < 0.01$). In contrast, ESG main effects and interaction terms are not statistically supported, suggesting that EPS in this model is driven more by scale than by variation in ESG disclosure.

Robustness Check: Bootstrap Estimates for ESG Total (BCa 95% Confidence Interval)

To make the inference more robust against deviations from classical assumptions, a bootstrap test was conducted to evaluate the relationship between ESG_TOTAL and financial performance, as well as the potential moderating effect of firm size. Bootstrap resampling is widely applied in empirical financial and sustainability research to obtain more reliable parameter estimates and confidence intervals when the underlying data may deviate from standard regression assumptions (Akhter et al., 2023; Arvidsson & Dumay, 2022).

In this robustness test, the bootstrap estimation results are presented in two panels. Panel A evaluates the direct effects of ESG_TOTAL and firm size on financial performance indicators. Meanwhile, Panel B examines the moderating role of firm size by including the interaction term between ESG_TOTAL and firm size (ESG_TOTAL $\times$ Firm Size). This two-panel specification allows the analysis to compare the baseline ESG-performance relationship with the model that incorporates moderation effects (Al-ahdal et al., 2023; Firmansyah et al., 2023).

Panel A: Direct Effects

Panel A reports the bootstrap estimation results for the direct relationship between ESG_TOTAL and financial performance indicators, including ROA, ROE, NPM, and EPS. This model focuses on the main effects of ESG_TOTAL and firm size without incorporating interaction variables.

The detailed bootstrap results for the direct-effect model are presented in Table 8.

Table 8
Bootstrap BCa 95% CI Panel A (ESG_TOTAL and Financial Performance)

Variable	ROA	ROE	NPM	EPS
Constant	1.898*** [p = 0.001; CI 1.262–2.432]	12.037*** [p < 0.001; CI 10.657–14.734]	21.495*** [p = 0.007; CI 10.402–28.030]	296.370*** [p < 0.001; CI 215.052–377.281]
Z(ESG_TOTAL)	1.124* [p = 0.054; CI 0.240–2.143]	3.138** [p = 0.014; CI 0.732–6.605]	4.325 [p = 0.489; CI -1.982–15.186]	-8.918 [p = 0.843; CI -115.315–115.466]
Z(FIRM_SIZE_LN)	-0.488 [p = 0.547; CI -1.626–1.062]	-0.954 [p = 0.643; CI -5.158–1.791]	16.826 [p = 0.359; CI 3.392–34.861]	130.953*** [p = 0.002; CI 59.462–259.444]

.Source: Processed data, 2025

Bootstrap inference provides complementary evidence for the aggregated ESG measure. ESG_TOTAL shows marginal support for ROA (B = 1.124; p = 0.054; BCa 95% CI from 0.240 to 2.143) and significant support for ROE (B = 3.138; p = 0.014; BCa 95% CI from 0.732 to 6.605). In contrast, the association is not supported for NPM (p = 0.489) and EPS (p = 0.843), as the confidence intervals include zero.

Panel B: Moderation (ESG_TOTAL $\times$ Firm Size)

Panel B extends the bootstrap analysis by incorporating the interaction term between ESG_TOTAL and firm size in order to evaluate whether firm size moderates the relationship between ESG performance and financial performance indicators.

The bootstrap estimation results for the moderation model are summarized in Table 9.

Table 9
Bootstrap BCa 95% CI Panel B (Moderation via ESG_TOTAL × Firm Size)

Variable	ROA	ROE	NPM	EPS
Constant	2.790*** [p = 0.002; CI 2.039–3.265]	13.594*** [p < 0.001; CI 11.895–14.822]	36.123*** [p = 0.001; CI 25.673–44.191]	267.785*** [p < 0.001; CI 208.654–335.936]
Z(ESG_TOTAL)	-0.517 [p = 0.598; CI -2.471–1.543]	0.357 [p = 0.827; CI -2.962–4.893]	-22.581 [p = 0.388; CI -59.423–6.772]	57.444 [p = 0.202; CI -72.942–134.722]
Z(FIRM_SIZE_LN)	-0.489 [p = 0.442; CI -1.492–0.508]	1.709 [p = 0.266; CI -1.110–4.758]	16.800 [p = 0.302; CI 4.167–25.670]	162.010*** [p = 0.003; CI 91.982–286.891]
Z(ESG_TOTAL×SIZE)	-1.367* [p = 0.074; CI -2.453–0.264]	-2.386* [p = 0.060; CI -4.840–1.550]	-22.417 [p = 0.348; CI -39.714–1.109]	43.805 [p = 0.137; CI -41.565–110.098]

Source: Processed data, 2025

After the interaction term is introduced, the direct effect of ESG_TOTAL becomes statistically insignificant across outcomes. The interaction term ZESGxZSIZE is negative and only marginal for ROA (B = -1.367; p = 0.074) and ROE (B = -2.386; p = 0.060). However, the BCa confidence intervals include zero, indicating that moderation evidence is suggestive rather than definitive. Firm size remains strongly positive for EPS (B = 162.010; p = 0.003; BCa 95% CI from 91.982 to 286.891), reinforcing the consistent role of scale in explaining EPS.

Hypothesis Testing

Hypothesis testing indicates that the direct effects of ESG disclosure dimensions on financial performance are largely weak in the baseline specification. Moderation testing suggests that firm size conditions selected relationships between ESG disclosure and performance. The results also show that the magnitude and significance of ESG effects differ across performance proxies, implying that ESG disclosure may be financially material only under certain performance definitions and organizational contexts.

First Hypothesis (H1): Environmental Disclosure positively affects financial performance

H1 is not supported. Environmental Disclosure (ED) is statistically insignificant across all baseline models, including ROA (t = 1.613), ROE (t = 1.305), NPM (t = 1.547), and EPS (t = 0.039). This finding suggests that environmental disclosure, when captured as a disclosure dimension, does not automatically translate into short term improvements in profitability or earnings per share during the observation period.

Second Hypothesis (H2): Social Disclosure positively affects financial performance

H2 is not supported. Social Disclosure (SD) shows no significant association with ROA (t = 0.819), ROE (t = 1.040), NPM (t = -0.639), or EPS (t = -0.171). This implies that the benefits of social disclosure may be reputational or relational in nature and may require longer horizons or alternative outcome measures to be reflected in accounting performance.

Third Hypothesis (H3): Governance Disclosure positively affects financial performance

H3 is not supported in the main effects model. Governance Disclosure (GD) is insignificant for ROA ($t = 1.016$), ROE ($t = 1.042$), NPM ($t = 0.430$), and EPS ($t = 0.270$). However, governance disclosure becomes relevant under moderation testing (H7), indicating that its financial implications may depend on bank size and associated monitoring or compliance intensity.

Fourth Hypothesis (H4): ESG disclosure jointly affects financial performance

H4 receives partial support, depending on how ESG is operationalized. In the disaggregated baseline model, ED, SD, and GD do not show individually significant effects, implying weak direct evidence for a joint ESG effect in that specification. However, robustness inference using the composite ESG_TOTAL indicates a positive association with ROA at marginal significance ($p = 0.054$) and a significant association with ROE ($p = 0.014$), while remaining insignificant for NPM ($p = 0.489$) and EPS ($p = 0.843$). This pattern suggests that a composite ESG signal may be more closely reflected in asset and equity based profitability than in margin based or earnings per share measures.

Fifth Hypothesis (H5): Firm size moderates the effect of Environmental Disclosure on financial performance

H5 is supported for NPM but not for other proxies. The interaction between ED and firm size is negative and strongly significant for NPM ($ZED \times ZSIZE$: $t = -6.686$; $p < 0.01$), indicating that the association between environmental disclosure and margin profitability becomes weaker, or more adverse, as firm size increases. For ROA ($t = -1.636$), ROE ($t = 0.096$), and EPS ($t = 0.829$), the moderation effect is not supported. Substantively, this suggests that larger banks may face higher environmental compliance, reporting, or implementation costs that are more visible in profitability margins.

Sixth Hypothesis (H6): Firm size moderates the effect of Social Disclosure on financial performance

H6 is not supported. The interaction between SD and firm size is insignificant for ROA ($t = -1.349$), ROE ($t = -1.205$), NPM ($t = -0.688$), and EPS ($t = 0.032$). This indicates that the financial consequences of social disclosure do not materially differ between larger and smaller banks in this sample, at least under the selected accounting based performance proxies.

Seventh Hypothesis (H7): Firm size moderates the effect of Governance Disclosure on financial performance

H7 receives support for ROA and weak support for ROE. The interaction between GD and firm size is negative and significant for ROA ($ZGD \times ZSIZE$: $t = -2.085$; $p < 0.05$), suggesting that the marginal association of governance disclosure with ROA diminishes as firm size increases. For ROE, the interaction is negative and marginally significant ($t = -1.948$; $p < 0.10$), while it is not supported for NPM ($t = -0.872$) and EPS ($t = 0.098$). This finding implies that, in larger banks, governance related disclosure and monitoring

structures may be associated with profitability pressures or tighter constraints that dampen accounting returns.

Eighth Hypothesis (H8): Firm size moderates the effect of overall ESG disclosure on financial performance

H8 is suggestive but not definitive. Bootstrap moderation indicates negative and marginal interaction effects for ROA ($p = 0.074$) and ROE ($p = 0.060$), while the interaction is insignificant for NPM ($p = 0.348$) and EPS ($p = 0.137$). Importantly, the BCa 95% confidence intervals for the ROA and ROE interactions include zero, implying that the moderation evidence does not meet a strict interval based robustness criterion. Therefore, the moderating role of firm size for overall ESG disclosure should be interpreted as indicative rather than conclusive.

Overall Interpretation

Across models, firm size shows a consistently positive association with financial performance in several specifications, particularly for NPM ($t = 2.968$; $p < 0.01$) and EPS ($t = 3.358$; $p < 0.01$) in the moderation model. This pattern indicates that scale advantages remain a primary driver of profitability differences. Meanwhile, the strongest conditional relationship is the negative interaction between ED and firm size for NPM, and the key governance related moderation effect is observed for ROA. Collectively, these findings support the view that ESG disclosure is not uniformly reflected in banking performance, but may become financially relevant under specific firm characteristics and performance definitions.

Discussion

The findings indicate that the relationship between Environmental Disclosure, Social Disclosure, and Governance Disclosure and the financial performance of Indonesian listed banks during 2020–2024 is context dependent and does not consistently appear as a uniform direct effect across performance proxies. In the baseline specifications, the coefficients of ED, SD, and GD are statistically insignificant for ROA, ROE, NPM, and EPS, whereas firm size emerges as a more stable driver of performance in certain models, particularly for NPM and EPS. This pattern suggests that variation in bank performance is more sensitive to scale related characteristics than to differences in ESG disclosure dimensions. In this sample, ESG disclosure scores are relatively high and less dispersed, which may reduce variation and weaken the explanatory power of ESG disclosure in direct tests.

Regarding the direct effect hypotheses, the empirical results do not provide strong support for H1, H2, and H3 because ED, SD, and GD are not significant predictors across the profitability measures in the baseline model. From a theoretical standpoint, this outcome remains plausible in emerging market settings where ESG disclosure may function primarily as a legitimacy and compliance signal rather than an immediately monetizable source of competitive advantage. Stakeholder and legitimacy perspectives posit that firms may expand disclosure to meet regulatory and societal expectations without necessarily generating short term improvements in accounting profitability, particularly when implementation and reporting costs are nontrivial (Arvidsson & Dumay, 2022; Kartika et al., 2023). In addition, prior evidence on ESG and financial performance remains mixed in developing economies, reinforcing the interpretation that

the absence of significance can be consistent with institutional conditions, disclosure quality, and time horizon differences (Husada & Handayani, 2021; Narula et al., 2024).

In contrast to the ESG dimensions, firm size shows a positive association with NPM and EPS in the baseline model. This aligns with the argument that larger banks may benefit from economies of scale, broader revenue diversification, and stronger access to funding, which can translate into superior margins and earnings per share. From a resource based view, larger asset bases imply greater internal capacity for efficiency, process improvement, and strengthened risk management systems, which can support performance outcomes (Alkaraan et al., 2022; Fujianti et al., 2024). Accordingly, firm size appears to exert a more dominant influence on profitability variation than disclosure intensity at the dimension level.

For the moderation hypotheses, the results suggest that the role of ESG disclosure may change when conditioned by firm size, although the pattern is not uniform across ESG dimensions and performance proxies. The clearest moderation evidence is observed for NPM through the interaction between ED and firm size, which is negative and highly significant. This indicates that the marginal relationship between ED and NPM diminishes as bank size increases. One plausible interpretation is that, in larger banks, expanded environmental disclosure may coincide with higher compliance, monitoring, and implementation costs, thereby reducing short term margins. This explanation is consistent with political cost theory, which emphasizes that highly visible firms face greater regulatory and public scrutiny and may bear higher political and compliance costs (Al-ahdal et al., 2023; Fujianti et al., 2024). In addition, the interaction between governance disclosure and firm size shows negative signals for ROA and ROE, implying that, among larger banks, greater governance disclosure is not necessarily accompanied by stronger accounting profitability. This pattern may reflect organizational complexity, additional control processes, and coordination costs. The fact that moderation effects are not consistently supported across all models also accords with the view that ESG becomes financially material only under certain boundary conditions rather than as a universal relationship (Huang, 2021; Ahmad et al., 2023).

When ESG is operationalized as an aggregate construct using ESG_TOTAL, the bootstrap based robustness results provide additional nuance. ESG_TOTAL shows a positive and statistically significant association with ROE and a marginally significant association with ROA, while remaining insignificant for NPM and EPS. This may indicate that return based measures are more responsive to overall sustainability consistency than to separate disclosure pillars, because aggregation can better capture integrated ESG practices and reduce measurement noise at the dimension level. This interpretation is consistent with the view that ESG is a multidimensional construct whose explanatory power may strengthen when treated holistically (Firmansyah et al., 2023). However, after introducing the interaction between ESG_TOTAL and firm size, moderation evidence becomes weaker and remains suggestive rather than definitive. Therefore, claims regarding aggregate moderation should be stated cautiously.

Overall, this study contributes to the ESG literature in emerging markets by underscoring that ESG disclosure in Indonesian banking does not consistently translate into strong direct effects on profitability across multiple accounting proxies. Instead, ESG disclosure may operate through conditional mechanisms that vary by firm size and by the selected performance indicator. The findings reinforce stakeholder and legitimacy arguments that interpret disclosure as accountability and expectation management. At the same time, political cost theory and resource based reasoning help explain why scale can alter the direction or strength of ESG performance linkages. From a practical

perspective, bank managers should distinguish between disclosure aimed at compliance and reputation and ESG initiatives designed to create measurable economic value. In addition, sustainability implementation should be accompanied by cost discipline so that potential benefits are not offset by reduced margins, particularly in larger institutions. For regulators and investors, the results highlight the importance of improving disclosure comparability and substance so that ESG information becomes more decision useful rather than primarily symbolic.

Several limitations should be acknowledged. The sample size is relatively limited, and heterogeneity across banks and years may not be fully captured in simple specifications. Diagnostic indications such as residual non normality and heteroskedasticity in some models suggest that inference should be interpreted prudently. Moreover, ESG effects may be delayed, while accounting indicators can reflect costs more quickly than long term benefits. Future research may extend the observation period, apply stronger panel approaches to address unobserved heterogeneity and potential endogeneity, incorporate lag structures to test delayed ESG effects, and examine differences across bank size groups, business models, and more granular measures of disclosure quality.

CONCLUSION AND SUGGESTION

This study finds that Environmental, Social, and Governance disclosure among Indonesian listed banks during 2020 to 2024 does not show a uniformly consistent relationship with accounting based financial performance when each ESG dimension is tested separately. This pattern supports the view that the relationship between ESG disclosure and financial performance is context dependent and may not translate into immediate profitability effects. At the same time, firm size appears to operate as a moderating condition, as the influence of ESG related disclosure tends to weaken for larger banks in several model specifications.

This suggests that differences in organizational capacity, regulatory scrutiny, and sustainability implementation costs across bank sizes may shape how disclosure relates to financial outcomes. By emphasizing the conditional nature of the ESG disclosure relationship in the Indonesian banking context, this study contributes to a more nuanced understanding in which ESG evaluation considers firm characteristics rather than focusing only on disclosure intensity.

Future research is encouraged to extend the observation period and incorporate alternative performance measures that may better capture longer term ESG materiality. Subsequent studies should also refine ESG measurement by focusing on disclosure depth and quality rather than relying only on whether items are reported. In addition, future work may incorporate additional firm level and governance controls to reduce omitted variable bias and test whether the relationship differs across banking business models and regulatory environments. These extensions may strengthen the robustness and interpretability of empirical findings.

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SURAT KETERANGAN

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Adalah Mahasiswi Jurusan Manajemen Fakultas Ekonomi dan Bisnis Universitas Palangka Raya dan yang bersangkutan telah menyelesaikan Ujian Pengganti Skripsi dalam bentuk Naskah Artikel Jurnal Ilmiah, telah menyelesaikan revisi, dan artikelnya telah diterima untuk diterbitkan, yang dibuktikan dengan adanya Letter of Acceptance (LOA) dari pihak jurnal. Saat ini artikel tersebut telah di produksi melalui Journal of Management (SMEs), Vol 19, No 1, 2026 (Edisi Maret 2026). Informasi terkait jurnal dapat diakses secara daring melalui tautan:

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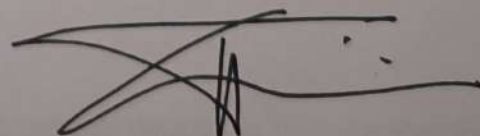
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LAMPIRAN 1

LEMBAR CHECKLIST PENGUMPULAN DATA

Instrumen penelitian dalam studi ini tidak berupa kuesioner survei, melainkan instrumen dokumentasi dan content analysis, mengingat data yang digunakan merupakan data sekunder yang bersumber dari laporan tahunan (annual report) dan laporan keberlanjutan (sustainability report) perusahaan perbankan yang terdaftar di Bursa Efek Indonesia periode 2020–2024.

Pemilihan instrumen ini sejalan dengan pendekatan penelitian kuantitatif berbasis dokumen yang umum digunakan dalam penelitian Environmental, Social, dan Governance Disclosure (Akhter et al., 2023; Firmansyah et al., 2023).

A. Instrumen Environmental Disclosure, Social Disclosure, dan Governance Disclosure

Environmental Disclosure, Social Disclosure, dan Governance Disclosure diukur menggunakan metode content analysis dengan instrumen berupa checklist indikator pengungkapan.

Instrumen ini dikembangkan berdasarkan:

- 1) POJK No. 51/POJK.03/2017 tentang Keuangan Berkelanjutan
- 2) Pedoman ESG internasional (S&P Global ESG Scores; Sustainalytics)
- 3) Penelitian terdahulu ((Akhter et al., 2023; Angir & Weli, 2024; Firmansyah et al., 2023).

Skema penilaian:

1 = indikator diungkapkan

0 = indikator tidak diungkapkan

Total skor dihitung dengan menjumlahkan seluruh item yang diungkapkan. tinggi skor, semakin baik tingkat pengungkapan keberlanjutan perusahaan.

Checklist Environmental Disclosure

No	Indikator Pengungkapan Lingkungan	2020	2021	2022	2023	2024
1	Penggunaan energi ramah lingkungan dan efisiensi energi					
2	Pengelolaan emisi karbon dan gas rumah kaca					
3	Program daur ulang limbah dan pengelolaan sampah					
4	Kebijakan perlindungan keanekaragaman hayati					
5	Penerapan green innovation atau teknologi ramah lingkungan					

Checklist Social Disclosure

No	Indikator Pengungkapan Sosial	2020	2021	2022	2023	2024
1	Program tanggung jawab sosial perusahaan (CSR)					
2	Kesehatan dan keselamatan kerja (K3)					
3	Keadilan dan kesejahteraan karyawan					
4	Hubungan perusahaan dengan masyarakat sekitar					
5	Keberagaman dan inklusivitas tenaga kerja					

Checklist Governance Disclosure

No	Indikator Pengungkapan Tata Kelola	2020	2021	2022	2023	2024
1	Struktur dan independensi dewan direksi dan komisaris					
2	Kebijakan anti-fraud dan anti-korupsi					
3	Transparansi remunerasi manajemen					
4	Kepatuhan terhadap regulasi dan audit internal					
5	Keterlibatan pemangku kepentingan (stakeholder engagement)					

$$\text{Skoe ESG Disclosure} = \frac{\text{Jumlah Indikator yang diungkapkan}}{15} \times 100\%$$

B. Instrumen Kinerja Keuangan (Y)

Kinerja keuangan tidak diukur menggunakan kuesioner, melainkan menggunakan rasio keuangan yang diperoleh dari laporan keuangan auditan perusahaan. Instrumen pengukuran meliputi:

- 1) $\text{ROE} = \text{Laba Bersih} \div \text{Ekuitas}$
- 2) $\text{ROA} = \text{Laba Bersih} \div \text{Total Aset}$
- 3) $\text{NPM} = \text{Laba Bersih} \div \text{Penjualan}$
- 4) $\text{EPS} = \text{Laba Bersih} \div \text{Jumlah Saham Beredar}$

Data bersumber dari laporan tahunan perusahaan yang dipublikasikan melalui situs resmi BEI dan situs perusahaan.

C. Instrumen Ukuran Perusahaan (Z)

Ukuran perusahaan diukur menggunakan logaritma natural total aset, yang mencerminkan skala operasional dan kapasitas sumber daya perusahaan.

$$Firm\ Size\ (Ukuran\ Perusahaan) = \ln (Total\ Aset)$$

Pendekatan ini umum digunakan dalam penelitian ESG dan kinerja keuangan sebagai variabel moderasi

LAMPIRAN 2

Distribusi Perusahaan Berdasarkan Sektor IDX ESG Leaders Index

No	Nama Bank	Kode	Status Laporan Keberlanjutan 2020–2024
1	PT Bank Mandiri (Persero) Tbk	BMRI	✓
2	PT Bank Negara Indonesia (Persero) Tbk	BBNI	✓
3	PT Bank Rakyat Indonesia (Persero) Tbk	BBRI	✓
4	PT Bank Central Asia Tbk	BBCA	✓
5	PT Bank CIMB Niaga Tbk	BNGA	✓
6	PT Bank OCBC NISP Tbk	NISP	✓
7	PT Bank Tabungan Negara (Persero) Tbk	BBTN	✓
8	PT Bank Syariah Indonesia Tbk	BRIS	✓
9	PT Bank BTPN Syariah Tbk	BTPS	✓
10	PT Bank Jago Tbk	ARTO	✓

LAMPIRAN 3

DATA TABULASI

Nama Bank	Tahun	Satuan Asal	Laba Bersih (angka asal)	Total Aset (angka asal)	Ekuitas (angka asal)	Pendapatan (angka asal)	Saham Beredar (angka asal)	Laba Bersih (Rp miliar)	Total Aset (Rp miliar)	Ekuitas (Rp miliar)	Pendapatan (Rp miliar)	Saham Beredar (lembar)	ROA	ROE	NPM	EPS (Rp/saham)	firm_size_In	
Bank BCA	2020	Rp miliar	27.147	1.075.570	184.715	75.165	24.655.010.000,00	27.147,000	1.075.570,000	184.715,000	75.165,000	24.655.010.000	2,52%	14,70%	36,12%	1.101,07	13,89	
Bank BCA	2021	Rp miliar	31.440	1.228.345	202.849	78.473	123.275.050.000,00	31.440,000	1.228.345,000	202.849,000	78.473,000	123.275.050.000	2,56%	15,50%	40,06%	255,04	14,02	
Bank BCA	2022	Rp miliar	40.736	1.314.732	221.182	87.476	123.275.050.000,00	40.736,000	1.314.732,000	221.182,000	87.476,000	123.275.050.000	3,10%	18,42%	46,57%	330,45	14,09	
Bank BCA	2023	Rp miliar	48.658	1.408.107	262.835	98.517	123.275.050.000,00	48.658,000	1.408.107,000	262.835,000	98.517,000	123.275.050.000	3,46%	18,51%	49,39%	394,71	14,16	
Bank BCA	2024	Rp miliar	54.851	1.449.301	242.538	108.307	123.275.050.000,00	54.851,000	1.449.301,000	242.538,000	108.307,000	123.275.050.000	3,78%	22,62%	50,64%	444,95	14,19	
Bank BNI	2020	Rp miliar	3.321	891.337	112.872	52.036	18.648.656.458,00	3.321,000	891.337,000	112.872,000	52.036,000	18.648.656.458	0,37%	2,94%	6,38%	178,08	13,70	
Bank BNI	2021	Rp miliar	10.977	964.838	126.520	55.865	18.648.656.458,00	10.977,000	964.838,000	126.520,000	55.865,000	18.648.656.458	1,14%	8,68%	19,65%	588,62	13,78	
Bank BNI	2022	Rp miliar	18.482	1.029.837	140.198	61.472	18.648.656.458,00	18.482,000	1.029.837,000	140.198,000	61.472,000	18.648.656.458	1,79%	13,18%	30,07%	991,06	13,84	
Bank BNI	2023	Rp miliar	21.106	1.086.664	154.733	62.747	37.297.312.916,00	21.106,000	1.086.664,000	154.733,000	62.747,000	37.297.312.916	1,94%	13,64%	33,64%	565,89	13,90	
Bank BNI	2024	Rp miliar	21.669	1.129.806	167.187	64.515	37.297.312.916,00	21.669,000	1.129.806,000	167.187,000	64.515,000	37.297.312.916	1,92%	12,96%	33,59%	580,98	13,94	
Bank BRI	2020	Rp juta	18.660.393	1.610.065.344	229.446.882	135.764.561	123.345.810.000,00	18.660,393	1.610.065,344	229.446,882	135.764.561	123.345.810.000	1,16%	8,13%	13,74%	151,29	14,29	
Bank BRI	2021	Rp juta	30.755.766	1.678.097.734	291.786.804	135.764.561	151.559.001.604,00	30.755,766	1.678.097,734	291.786,804	135.764.561	151.559.001.604	1,83%	10,54%	22,65%	202,93	14,33	
Bank BRI	2022	Rp juta	51.408.207	1.865.639.010	303.395.317	151.874.816	151.559.001.604,00	51.408,207	1.865.639,010	303.395,317	151.874.816	151.559.001.604	2,76%	16,94%	33,85%	339,20	14,44	
Bank BRI	2023	Rp juta	60.425.048	1.965.007.030	316.472.142	181.214.528	151.559.001.604,00	60.425,048	1.965.007,030	316.472,142	181.214,528	151.559.001.604	3,08%	19,09%	33,34%	398,69	14,49	
Bank BRI	2024	Rp juta	60.643.808	1.992.983.447	323.189.047	199.266.252	151.559.001.604,00	60.643,808	1.992.983,447	323.189,047	199.266,252	151.559.001.604	3,04%	18,76%	30,43%	400,13	14,51	
Bank BTN	2020	Rp juta	1.602.358	361.208.406	19.987.845	16.121.388		10,59	1.602,358	361.208,406	19.987,845	16.121,388	10.590.000.000	0,44%	8,02%	9,94%	151,31	12,80
Bank BTN	2021	Rp juta	2.376.227	371.868.311	21.406.647	15.359.017		10,59	2.376,227	371.868,311	21.406,647	15.359,017	10.590.000.000	0,64%	11,10%	15,47%	224,38	12,83
Bank BTN	2022	Rp juta	3.045.073	402.148.312	25.909.354	17.089.233		12,87	3.045,073	402.148,312	25.909,354	17.089,233	12.870.000.000	0,76%	11,75%	17,82%	236,60	12,90
Bank BTN	2023	Rp juta	3.500.988	438.749.736	30.479.152	17.321.704		14,03	3.500,988	438.749,736	30.479,152	17.321,704	14.030.000.000	0,80%	11,49%	20,21%	249,54	12,99
Bank BTN	2024	Rp juta	3.007.328	469.614.502	32.571.889	16.064.214		14,03	3.007,328	469.614,502	32.571,889	16.064,214	14.030.000.000	0,64%	9,23%	18,72%	214,35	13,06
Bank BTPN SYARIAH	2020	Rp juta	854.614	16.435.005	5.883.231	4.060.429	7.703.700.000,00	854,614	16.435,005	5.883,231	4.060,429	7.703.700.000	5,20%	14,53%	21,05%	110,94	9,71	
Bank BTPN SYARIAH	2021	Rp juta	1.465.005	18.543.856	6.187.874	4.695.118	7.703.700.000,00	1.465,005	18.543,856	6.187,874	4.695,118	7.703.700.000	7,90%	23,68%	31,20%	190,17	9,83	
Bank BTPN SYARIAH	2022	Rp juta	1.779.580	21.161.976	7.351.799	5.440.099	7.703.700.000,00	1.779,580	21.161,976	7.351,799	5.440,099	7.703.700.000	8,41%	24,21%	32,71%	231,00	9,96	
Bank BTPN SYARIAH	2023	Rp juta	1.080.588	21.435.366	8.776.682	7.490.008	7.703.700.000,00	1.080,588	21.435,366	8.776,682	7.490,008	7.703.700.000	5,04%	12,31%	14,43%	140,27	9,97	
Bank BTPN SYARIAH	2024	Rp juta	1.061.160	21.747.580	9.316.594	7.664.501	7.703.700.000,00	1.061,160	21.747,580	9.316,594	7.664,501	7.703.700.000	4,88%	11,39%	13,85%	137,75	9,99	
Bank JAGO	2020	Rp juta	-185.731	2.179.873	1.232.333	89.770	10.856.250.000,00	-185,731	2.179,873	1.232,333	89,770	10.856.250.000	-8,52%	-15,07%	-206,90%	-17,11	7,69	
Bank JAGO	2021	Rp juta	86.024	12.312.422	8.249.455	645.428	13.856.250.000,00	86,024	12.312,422	8.249,455	645,428	13.856.250.000	0,70%	1,04%	13,33%	6,21	9,42	
Bank JAGO	2022	Rp juta	15.913	16.965.295	8.263.757	1.431.019	13.856.250.000,00	15,913	16.965,295	8.263,757	1.431,019	13.856.250.000	0,09%	0,19%	1,11%	1,15	9,74	
Bank JAGO	2023	Rp juta	72.362	21.295.840	8.356.792	1.762.464	13.856.250.000,00	72,362	21.295,840	8.356,792	1.762,464	13.856.250.000	0,34%	0,87%	4,11%	5,22	9,97	
Bank JAGO	2024	Rp juta	128.518	28.542.712	8.518.924	1.844.376	13.858.797.100,00	128,518	28.542,712	8.518,924	1.844,376	13.858.797.100	0,45%	1,51%	6,97%	9,27	10,26	
Bank Mandiri	2020	Rp juta	18.398.928	1.541.964.567	313.474.681	92.628.917	46.666.666.666,00	18.398,928	1.541.964,567	313.474,681	92.628,917	46.666.666.666	1,19%	5,87%	19,86%	394,26	14,25	
Bank Mandiri	2021	Rp juta	44.952.368	1.725.611.128	287.494.962	103.878.447	46.666.666.666,00	44.952,368	1.725.611,128	287.494,962	103.878,447	46.666.666.666	2,61%	15,64%	43,27%	963,27	14,36	
Bank Mandiri	2022	Rp juta	44.952.368	1.992.544.687	252.245.455	124.651.755	46.666.666.666,00	44.952,368	1.992.544,687	252.245,455	124.651,755	46.666.666.666	2,26%	17,82%	36,06%	963,27	14,50	
Bank Mandiri	2023	Rp juta	60.051.870	2.174.219.449	222.111.282	138.532.466	93.333.333.332,00	60.051,870	2.174.219,449	222.111,282	138.532,466	93.333.333.332	2,76%	27,04%	43,35%	643,41	14,59	
Bank Mandiri	2024	Rp juta	61.165.121	2.427.223.262	204.699.668	146.448.748	93.333.333.332,00	61.165,121	2.427.223,262	204.699,668	146.448,748	93.333.333.332	2,52%	29,88%	41,77%	655,34	14,70	
Bank NIAGA	2020	Rp juta	2.011.254	280.943.605	41.053.051	16.358.525		20,111,254	280.943,605	41.053,051	16.358,525	25.132.000.000	0,72%	4,90%	12,29%	80,03	12,55	
Bank NIAGA	2021	Rp juta	4.212.861	310.786.960	43.388.358	17.567.517		25,132,00	4.212,861	310.786,960	43.388,358	17.567,517	25.132.000.000	1,36%	9,71%	23,98%	167,63	12,65
Bank NIAGA	2022	Rp juta	5.096.771	306.754.299	45.276.263	18.865.721		25,132,00	5.096,771	306.754,299	45.276,263	18.865,721	25.132.000.000	1,66%	11,26%	27,02%	202,80	12,63
Bank NIAGA	2023	Rp juta	6.551.401	334.369.233	49.337.371	18.785.520		25,132,00	6.551,401	334.369,233	49.337,371	18.785,520	25.132.000.000	1,96%	13,28%	34,87%	260,68	12,72
Bank NIAGA	2024	Rp juta	6.898.934	360.220.510	53.196.327	18.917.536		25,142,00	6.898,934	360.220,510	53.196,327	18.917,536	25.142.000.000	1,92%	12,97%	36,47%	274,40	12,79
Bank OCB	2020	Rp juta	2.101.671	206.297.200	29.829.316	9.362.085	22.945.296.972,00	2.101,671	206.297,200	29.829,316	9.362,085	22.945.296.972	1,02%	7,05%	22,45%	91,59	12,24	
Bank OCB	2021	Rp juta	2.519.619	214.395.608	32.327.571	9.702.731	22.945.296.972,00	2.519,619	214.395,608	32.327,571	9.702,731	22.945.296.972	1,18%	7,79%	25,97%	109,81	12,28	
Bank OCB	2022	Rp juta	3.326.930	238.498.560	34.211.035	10.604.170	22.945.296.972,00	3.326,930	238.498,560	34.211,035	10.604,170	22.945.296.972	1,39%	9,72%	31,37%	144,99	12,38	
Bank OCB	2023	Rp juta	4.091.043	249.757.139	37.320.268	11.313.154	22.945.296.972,00	4.091,043	249.757,139	37.320,268	11.313,154	22.945.296.972	1,64%	10,96%	36,16%	178,30	12,43	
Bank OCB	2024	Rp juta	4.866.750	281.008.237	40.691.379	11.936.019	22.945.296.972,00	4.866,750	281.008,237	40.691,379	11.936,019	22.945.296.972	1,73%	11,96%	40,77%	212,10	12,55	
Bank SYARIAH	2020	Rp juta	2.187.649	239.581.524	21.743.145	16.929.592	9.											

LAMPIRAN 4

HASIL OLAH DATA MENGGUNAKAN SPSS VERSI 23

A. ANALISIS DESKRIPTIF VARIABEL

Tabel 1. Descriptive Statistics (N = 50)

Variable	N	Min	Max	Mean	Std. Dev.
ED	50	2.00	5.00	4.48	0.839
SD	50	1.00	5.00	4.72	0.834
GD	50	2.00	5.00	4.80	0.639
ESG_TOTAL	50	7.00	15.00	14.00	1.852
ROA	50	-8.52	8.41	1.898	2.287
ROE	50	-15.07	29.88	12.037	7.501
NPM	50	-206.90	50.64	21.495	35.134
EPS	50	-17.11	1101.07	296.370	268.642
FIRM_SIZE_LN	50	7.69	14.70	12.670	1.721

Sumber: Data diolah, 2026

B. UJI ASUMSI KLASIK

1. Uji Normalitas Residual (Shapiro-Wilk)

Tabel 2. Normality of Residuals (Shapiro-Wilk Summary)

Item	Result
Number of Residual Series Tested	17
Residual Series with p-value < 0.05	15
Conclusion	Residual Normality Is Not Fully Satisfied

Sumber: Data diolah, 2026

2. Uji Heteroskedastisitas (Glejser Test)

Tabel 3. Heteroskedasticity Test (Glejser), Significant Predictors (p < 0.05)

Dependent Variable	Significant Predictor	p-value
ROA	Zscore(ED)	0.036
ROA	Zscore(SD)	0.032
ROA	ZEDxZSIZE	0.001
ROA	ZSDxZSIZE	0.014
ROA	ZGDxZSIZE	0.029
ROE	ZEDxZSIZE	0.025
NPM	Zscore(SD)	0.024

NPM	ZEDxZSIZE	0.002
NPM	ZSDxZSIZE	0.024
NPM	ZGDxZSIZE	0.016
EPS	None	-

Sumber: Data diolah, 2026

3. Uji Autokorelasi (Durbin-Watson)

Tabel 4. Durbin-Watson Statistic

Dependent Variable	Model (1)	Model (2)
ROA	1.346	0.987
ROE	1.263	1.307
NPM	1.838	1.652
EPS	1.306	1.394

Sumber: Data diolah, 2025

4. Uji Multikolinearitas (VIF Summary)

Tabel 5. Multicollinearity Diagnostic (VIF Summary)

Model	VIF Range (Reported)	Note
Model (1)	Approx. 1.48 to 2.08	Low multicollinearity
Model (2)	Increases substantially (e.g. VIF for Zscore(SD) $\approx$ 31.78)	Interaction terms may inflate VIF

Sumber: Data diolah, 2026

C. HASIL UJI REGRESI

1. Model (1) – Main Effects (ED, SD, GD, Firm Size)

Tabel 6. Regression Results for Model (1)

Variable	ROA	ROE	NPM	EPS
Constant	-3.123 (-1.127)	-25.278*** (-3.222)	-137.669*** (-3.715)	-957.328*** (-3.440)
ED	0.735 (1.613)	1.684 (1.305)	9.432 (1.547)	1.802 (0.039)
SD	0.445 (0.819)	1.599 (1.040)	-4.637 (-0.639)	-9.317 (-0.171)
GD	0.678 (1.016)	1.968 (1.042)	3.833 (0.430)	18.100 (0.270)
Firm_Size_Ln	-0.286 (-1.152)	1.009 (1.434)	9.502*** (2.861)	94.924*** (3.806)
Observations	50	50	50	50

R Squared	0.151	0.367	0.356	0.379
Adjusted R ²	0.075	0.311	0.299	0.324
F Statistic	1.993	6.528	6.229	6.873
Durbin-Watson	1.346	1.263	1.838	1.306

Catatan: Nilai dalam kurung adalah *t*-statistics. Signifikansi: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Sumber: Data diolah, 2026

2. Model (2) – Moderation Model (Interaction Effects of ESG Dimensions and Firm Size)

Tabel 7. Regression Results for Model (2)

Variable	ROA	ROE	NPM	EPS
Constant	3.361*** (6.619)	15.462*** (9.255)	37.639*** (8.172)	271.909*** (4.238)
ED	0.482 (1.351)	1.746 (1.488)	-0.260 (- 0.080)	15.984 (0.355)
SD	-1.592 (- 1.112)	-4.484 (- 0.952)	-12.494 (- 0.963)	-2.120 (- 0.012)
GD	-1.108 (- 1.438)	-3.148 (- 1.242)	-6.792 (- 0.972)	26.932 (0.277)
Firm_Size_Ln	-0.433 (- 1.060)	2.454* (1.823)	11.012*** (2.968)	173.552*** (3.358)
ZEDxZSIZE	-0.556 (- 1.636)	0.107 (0.096)	-20.620*** (- 6.686)	35.631 (0.829)
ZSDxZSIZE	-1.142 (- 1.349)	-3.356 (- 1.205)	-5.279 (- 0.688)	3.474 (0.032)
ZGDxZSIZE	-1.163** (- 2.085)	-3.573* (- 1.948)	-4.409 (- 0.872)	6.921 (0.098)
Observations	50	50	50	50
R Squared	0.483	0.479	0.820	0.401
Adjusted R ²	0.396	0.392	0.790	0.302
F Statistic	5.597	5.522	27.259	4.022
Durbin-Watson	0.987	1.307	1.652	1.394

Catatan: Nilai dalam kurung adalah *t*-statistics. Signifikansi: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$.

Sumber: Data diolah, 2026

D. ROBUSTNESS CHECK: BOOTSTRAP ESTIMATES (BCa 95% CONFIDENCE INTERVAL)

Panel A – Direct Effects (ESG_TOTAL dan Financial Performance)

Tabel 8. Bootstrap BCa 95% CI Panel A (ESG_TOTAL and Financial Performance)

Variable	ROA	ROE	NPM	EPS
Constant	1.898*** [p=0.001; CI 1.262– 2.432]	12.037*** [p<0.001; CI 10.657– 14.734]	21.495*** [p=0.007; CI 10.402– 28.030]	296.370*** [p<0.001; CI 215.052– 377.281]
Z(ESG_TOTAL)	1.124* [p=0.054; CI 0.240– 2.143]	3.138** [p=0.014; CI 0.732– 6.605]	4.325 [p=0.489; CI -1.982– 15.186]	-8.918 [p=0.843; CI - 115.315– 115.466]
Z(FIRM_SIZE_LN)	-0.488 [p=0.547; CI -1.626– 1.062]	-0.954 [p=0.643; CI -5.158– 1.791]	16.826 [p=0.359; CI 3.392– 34.861]	130.953*** [p=0.002; CI 59.462– 259.444]

Catatan: Signifikansi: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. CI = BCa 95% Confidence Interval.
Sumber: Data diolah, 2026

Panel B – Moderation (ESG_TOTAL × Firm Size)

Tabel 9. Bootstrap BCa 95% CI Panel B (Moderation via ESG_TOTAL × Firm Size)

Variable	ROA	ROE	NPM	EPS
Constant	2.790*** [p=0.002; CI 2.039– 3.265]	13.594*** [p<0.001; CI 11.895– 14.822]	36.123*** [p=0.001; CI 25.673– 44.191]	267.785*** [p<0.001; CI 208.654– 335.936]
Z(ESG_TOTAL)	-0.517 [p=0.598; CI -2.471– 1.543]	0.357 [p=0.827; CI -2.962– 4.893]	-22.581 [p=0.388; CI - 59.423– 6.772]	57.444 [p=0.202; CI - 72.942– 134.722]
Z(FIRM_SIZE_LN)	-0.489 [p=0.442; CI -1.492– 0.508]	1.709 [p=0.266; CI -1.110– 4.758]	16.800 [p=0.302; CI 4.167– 25.670]	162.010*** [p=0.003; CI 91.982– 286.891]
Z(ESG_TOTAL×SIZE)	-1.367* [p=0.074; CI -2.453– 0.264]	-2.386* [p=0.060; CI -4.840– 1.550]	-22.417 [p=0.348; CI - 39.714– 1.109]	43.805 [p=0.137; CI - 41.565– 110.098]

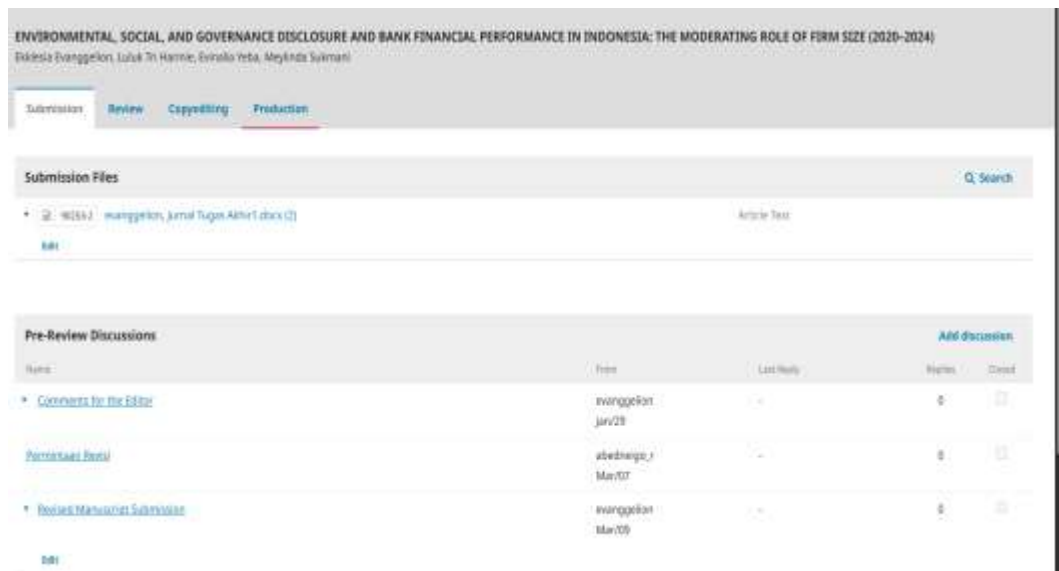
Catatan: Signifikansi: *** $p < 0.01$; ** $p < 0.05$; * $p < 0.10$. CI = BCa 95% Confidence Interval.
Sumber: Data diolah, 2026

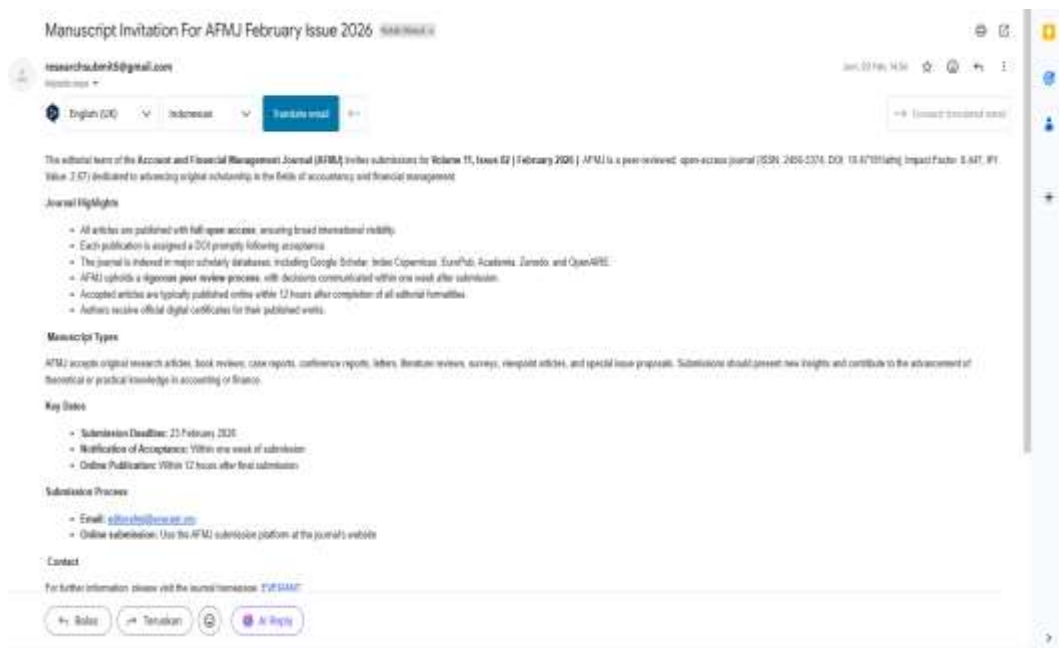
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Dear author (s): **Ekklesia Evangelion, Luluk Tri Harinie, Evinalia Yeba, Meylinda Sukmani**

Congratulation! Your article entitled “**ENVIRONMENTAL, SOCIAL, AND GOVERNANCE DISCLOSURE AND BANK FINANCIAL PERFORMANCE IN INDONESIA: THE MODERATING ROLE OF FIRM SIZE (2020-2024)**” was accepted for publication in the Journal of Management (SME's), Vol 19 No 1, March 2026. We thank you for your contribution to this journal.

Best regards,

Editor in-chief,



Antonio Nyoko

6. Uji Plagiasi



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ENVIRONMENTAL, SOCIAL, AND GOVERNANCE DISCLOSURE AND BANK FINANCIAL PERFORMANCE IN INDONESIA: THE MODERATING ROLE OF FIRM SIZE (2020–2024)

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ABSTRACT

This study examines whether Environmental, Social, and Governance (ESG) disclosure is associated with the financial performance of Indonesian listed banks during the 2020–2024 period and whether firm size moderates this relationship. The research adopts a quantitative explanatory approach, where ESG disclosure is measured using a disclosure index developed through content analysis of annual and sustainability reports. Financial performance is represented by several indicators, including return on assets, return on equity, net profit margin, and earnings per share. The findings indicate that the direct effects of individual ESG disclosure dimensions on financial performance are generally weak and not consistently evident across different performance indicators. Meanwhile, firm size shows a more stable relationship with financial performance in several model specifications. When the moderating effect is considered, the relationship between ESG disclosure and financial performance appears more conditional, suggesting that the financial relevance of ESG practices may depend on specific bank characteristics. This study is limited by a relatively small sample size and the use of disclosure-based ESG measurement. Future research is recommended to expand the sample coverage, extend the observation period, and incorporate alternative ESG measurement approaches to provide more comprehensive insights into the relationship between ESG practices and financial performance.

Keywords: ESG Disclosure; Banking Sector; Financial Performance; Firm Size Moderation; Indonesia Stock Exchange

INTRODUCTION

Environmental, Social, and Governance (ESG) has become a central framework for evaluating corporate sustainability, accountability, and long term resilience (Huang, 2021; Narula et al., 2024; Pereira & Martins, 2021). ESG disclosure, commonly communicated through annual reports, sustainability reports, or integrated reports, provides stakeholders with structured information about a firm's environmental management, social responsibility, and governance practices (Arvidsson & Dumay, 2022; Firmansyah et al., 2023). In capital markets, ESG disclosure is frequently treated as decision relevant information because it can strengthen transparency, reduce information asymmetry, and support stakeholder monitoring, particularly for investors and regulators (Arvidsson & Dumay, 2022; Onjewu et al., 2023). As sustainability considerations increasingly influence risk assessment and capital allocation, ESG disclosure is expected to play a more material role in shaping how firms are evaluated (Maji & Lohia, 2023; Narula et al., 2024).

In the ASEAN region, sustainability reporting expectations have intensified through both regulatory developments and market initiatives. In Indonesia, sustainable finance has been promoted by the Financial Services Authority, and the stock exchange has introduced ESG related instruments, including the IDX ESG Leaders Index (Fujianti et al., 2024; Kartika et al., 2023). Despite these developments, ESG reporting practices in Indonesia still face challenges, such as uneven disclosure quality, limited comparability across firms, and differences in organizational capacity to implement and report ESG programs (Kartika et al., 2023; Purnomo et al., 2023). These constraints indicate that ESG disclosure may not carry uniform informational value across issuers, which creates a practical concern for stakeholders attempting to interpret ESG signals consistently.

The Indonesian banking sector provides a relevant context to examine these issues. Banks operate under relatively strict regulatory oversight and play a pivotal role in sustainable finance through financial intermediation, including the allocation of capital to economic activities with environmental and social implications. Banking is also a trust sensitive industry, where credibility and transparency can shape stakeholder confidence and perceived stability (Husada & Handayani, 2021). However, ESG disclosure among listed banks still varies in breadth and consistency, including among highly visible institutions (Kartika et al., 2023). This variation raises a research problem regarding whether differences in ESG disclosure are associated with differences in banks' financial performance within the Indonesian capital market setting (Firmansyah et al., 2023; Maji & Lohia, 2023).

Prior empirical evidence on the relationship between ESG disclosure and financial performance remains mixed, particularly in emerging markets where disclosure maturity, enforcement intensity, and implementation costs differ across firms and over time. Some studies report positive associations between ESG disclosure and profitability or firm value, while others find negative or statistically insignificant relationships, implying that ESG may become financially relevant only under certain conditions or institutional environments (Huang, 2021; Maji & Lohia, 2023; Al-ahdal et al., 2023; Narula et al., 2024). In Indonesia, findings also remain inconclusive, with evidence suggesting that ESG may not always translate into improved financial outcomes or may require governance related mechanisms to become financially meaningful (Husada & Handayani, 2021; Arofah & Khomsiyah, 2023). This inconsistency constitutes a research gap that warrants context specific testing focused on Indonesia's listed banking sector, using

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multiple profitability proxies and a design that can evaluate potential boundary conditions.

Firm size is a plausible boundary condition because it reflects visibility, resource capacity, and exposure to stakeholder scrutiny (Ahmad et al., 2023; Mahajan et al., 2023).

Larger banks typically possess stronger financial and organizational resources to implement sustainability programs and produce more systematic reporting, while also facing higher monitoring, compliance, and reputational pressures. These conditions can influence both the level of ESG disclosure and its potential financial consequences, either through efficiency gains and reputational benefits or through higher implementation and compliance costs (Ahmad et al., 2023; Fujianti et al., 2024). Therefore, firm size may strengthen or weaken the relationship between ESG disclosure dimensions and financial performance, which is particularly relevant in the banking sector, where size is closely related to systemic importance and regulatory attention.

Accordingly, this study aims to examine the effects of Environmental Disclosure, Social Disclosure, and Governance Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange during 2020–2024, with firm size as a moderating variable. Financial performance is assessed using Return on Assets, Return on Equity, Net Profit Margin, and Earnings per Share. ESG disclosure is operationalized through a structured disclosure index derived from company reports and analyzed using baseline and moderation specifications to evaluate both direct and conditional relationships. The study is expected to strengthen empirical understanding of ESG disclosure in emerging market banking and provide practical implications for regulators, investors, and bank management regarding disclosure quality, transparency, and competitiveness in sustainable finance.

LITERATURE REVIEW, RESEARCH FRAMEWORK, AND HYPOTHESES

Stakeholder Theory

Stakeholder theory explains that banks must be accountable to multiple stakeholder groups, not only shareholders (Mahajan et al., 2023). ESG disclosure can reduce information asymmetry and strengthen stakeholder trust, which may support financial performance through reputation and stakeholder support (Arvidsson & Dumay, 2022; Sciarelli et al., 2021).

Legitimacy Theory

Legitimacy theory posits that firms maintain operations by aligning with societal norms and sustainability expectations (Akhter et al., 2023). ESG disclosure functions as a legitimacy mechanism that may reduce reputational risk and strengthen acceptance under increasing sustainable finance pressures (Hamm et al., 2022; Kartika et al., 2023).

Agency Theory

Agency theory highlights conflicts and information gaps between owners and managers. Disclosure serves as a monitoring tool that can reduce agency costs (Santoso et al., 2022). Governance disclosure is especially relevant because it signals internal control and oversight quality. This mechanism may support performance in regulated financial institutions (Onjewu et al., 2023).

Triple Bottom Line (TBL)

TBL views firm success as the integration of economic, environmental, and social outcomes (Pereira & Martins, 2021). ESG disclosure reflects this integration and may

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contribute to financial performance when sustainability practices are embedded in strategy rather than treated as symbolic reporting (Shim et al., 2021).

Signaling Theory

Signaling theory suggests firms disclose information to reduce uncertainty and convey quality to investors (Handoko, 2021). ESG disclosure can act as a signal of long term orientation and risk governance, which may shape investor confidence and financial outcomes (Arvidsson & Dumay, 2022).

Political Cost Theory

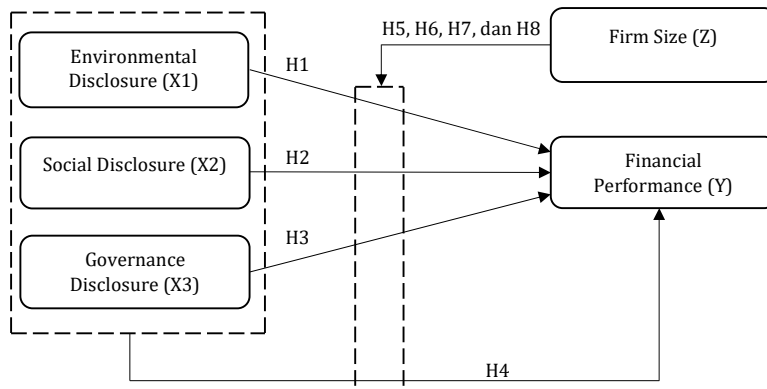
Political cost theory argues that larger, more visible firms face stronger regulatory and public scrutiny. Therefore, they have incentives to disclose more in order to manage political and regulatory pressure (Al-ahdal et al., 2023). This logic supports firm size as a potential moderator of the ESG performance relationship (Fujianti et al., 2024).

Resource-Based View (RBV)

RBV emphasizes that performance depends on unique internal resources and capabilities (Alkaraan et al., 2022). Larger banks typically possess greater resources to implement and report ESG programs more substantively. This capacity can strengthen the performance relevance of ESG disclosure (Fujianti et al., 2024; Narula et al., 2024).

Research Framework

Based on the theoretical perspectives and empirical findings discussed in the previous section, this study develops a conceptual research framework to examine the relationship between ESG disclosure, firm size, and financial performance, as illustrated in Figure 1.



Source: Adapted from Firmansyah et al., (2023)

Figure 1
Research Framework

This study adopts the conceptual logic used by (Firmansyah et al., 2023) by positioning Environmental Disclosure, Social Disclosure, and Governance Disclosure as explanatory variables that may influence banks' financial performance. Financial

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performance is captured using ROA, ROE, NPM, and EPS to represent profitability, operational efficiency, margin strength, and shareholder oriented outcomes. The framework also incorporates firm size as a moderating variable because it reflects differences in internal resources (resource based view), external scrutiny and legitimacy pressure (legitimacy theory), stakeholder breadth (stakeholder theory), and political and regulatory exposure (political cost theory). These factors may strengthen or weaken the relationship between ESG disclosure and financial performance.

Hypotheses

Environmental disclosure reflects how banks communicate policies, initiatives, and outcomes related to environmental management and sustainability practices. Such disclosure provides stakeholders with information regarding how organizations address environmental risks and responsibilities within their operations (Arvidsson & Dumay, 2022; Firmansyah et al., 2023). From stakeholder and legitimacy perspectives, credible environmental disclosure can strengthen stakeholder confidence and social acceptance. Transparent environmental reporting signals organizational responsibility and responsiveness to societal expectations, which may enhance corporate reputation and support long-term business sustainability (Mahajan et al., 2023). In industries that rely heavily on public trust, such as banking, strengthened legitimacy and stakeholder confidence may contribute to improved financial outcomes (Akhter et al., 2023). Therefore, environmental disclosure is expected to positively influence financial performance by enhancing legitimacy, stakeholder trust, and the credibility of sustainability commitments.

H1: Environmental Disclosure positively affects the financial performance of banks listed on the Indonesia Stock Exchange.

Social disclosure indicates transparency regarding employee welfare, occupational health and safety, human capital development, consumer responsibility, and community engagement. This form of disclosure reflects how organizations communicate their social responsibility practices to stakeholders (Arvidsson & Dumay, 2022; Firmansyah et al., 2023). Stronger social disclosure can enhance corporate reputation and stakeholder support. When organizations demonstrate responsibility toward employees, customers, and communities, stakeholders may respond with greater trust and engagement. Such positive stakeholder relationships can reduce relational frictions and operational risks, thereby supporting more stable operations and potentially improving profitability (Huang, 2021; Maji & Lohia, 2023). Accordingly, social disclosure is expected to contribute positively to the financial performance of banking institutions.

H2: Social Disclosure positively affects the financial performance of banks listed on the Indonesia Stock Exchange.

Governance disclosure signals the extent to which banks communicate oversight structures, internal controls, ethical standards, and accountability mechanisms to stakeholders. Such transparency helps stakeholders evaluate the effectiveness of corporate governance systems and managerial accountability (Ahmad et al., 2023; Arvidsson & Dumay, 2022). Agency theory suggests that stronger governance transparency can reduce information asymmetry between managers and stakeholders, constrain opportunistic behavior, and improve the quality of strategic decision-making. These governance mechanisms are particularly important in highly regulated sectors such as banking, where effective monitoring and accountability are essential for

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maintaining institutional credibility (Al-ahdal et al., 2023; Narula et al., 2024). Therefore, greater governance disclosure is expected to strengthen financial performance by improving transparency, accountability, and stakeholder confidence.

H3: Governance Disclosure positively affects the financial performance of banks listed on the Indonesia Stock Exchange.

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ESG disclosure is inherently multidimensional, encompassing environmental, social, and governance dimensions that collectively reflect a firm's sustainability orientation. The financial relevance of one dimension may depend on the consistency and integration of the other dimensions (Huang, 2021; Narula et al., 2024). ESG disclosure may represent a coherent sustainability strategy and organizational capability rather than fragmented reporting practices. When organizations communicate ESG practices in a consistent and integrated manner, stakeholders may perceive the firm's sustainability commitments as more credible and strategically aligned. This coherence can strengthen stakeholder trust and enhance the credibility of risk management practices (Ahmad et al., 2023; Maji & Lohia, 2023). Thus, integrated ESG disclosure may contribute positively to financial performance. credibility.

H4: Integrated ESG Disclosure positively affects the financial performance of banks listed on the Indonesia Stock Exchange.

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Firm size may influence whether environmental disclosure becomes financially material. Larger firms generally face stronger public scrutiny and regulatory expectations, which encourage more extensive environmental disclosure practices (Ahmad et al., 2023; Al-ahdal et al., 2023). Large banks typically possess greater financial and organizational resources to implement environmental initiatives and sustainability reporting systems. However, these institutions may also face higher implementation and compliance costs associated with environmental management, which can influence short-term financial outcomes (Kartika et al., 2023; Narula et al., 2024). Therefore, firm size may moderate the relationship between environmental disclosure and financial performance.

H5: Firm size moderates the effect of Environmental Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange.

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The benefits of social disclosure may vary depending on organizational scale and stakeholder visibility. Larger banks interact with broader stakeholder groups and face stronger expectations regarding social responsibility and transparency (Huang, 2021; Mahajan et al., 2023). Consequently, credible social disclosure by large banks may generate stronger reputational benefits and stakeholder support. In contrast, smaller banks may experience resource constraints that limit the scope and consistency of social reporting (Maji & Lohia, 2023). Thus, firm size may influence the strength of the relationship between social disclosure and financial performance.

H6: Firm size moderates the effect of Social Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange.

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As organizational size increases, operational complexity and agency problems may also intensify. Larger organizations often face more complex governance structures and greater monitoring demands (Al-ahdal et al., 2023). To address these challenges, large banks may rely more heavily on governance mechanisms and disclosure practices to maintain transparency and credibility under heightened regulatory and stakeholder

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scrutiny. At the same time, the costs associated with governance compliance may also increase (Ahmad et al., 2023; Narula et al., 2024). Accordingly, firm size may moderate the relationship between governance disclosure and financial performance.

H7: Firm size moderates the effect of Governance Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange.

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Integrated ESG disclosure may be more financially relevant in larger banks that possess the institutional capacity to embed ESG practices within their organizational strategy and governance systems (Huang, 2021). Larger banks often face stronger scrutiny from regulators, investors, and the public, which can amplify both the benefits and trade-offs associated with ESG implementation. When ESG practices are effectively institutionalized and communicated through integrated disclosure, the resulting credibility may enhance stakeholder trust and corporate reputation (Maji & Lohia, 2023; Narula et al., 2024). Thus, firm size may influence the strength of the relationship between integrated ESG disclosure and financial performance.

H8: Firm size moderates the effect of Integrated ESG Disclosure on the financial performance of banks listed on the Indonesia Stock Exchange.

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METHOD

This study applies a quantitative, causal explanatory design to examine the effects of Environmental Disclosure, Social Disclosure, and Governance Disclosure on the financial performance of Indonesian listed banks, with firm size as a moderating variable. The study focuses on banks included in the IDX ESG Leaders Index during 2020–2024, using full year observations. The unit of analysis is the firm year, resulting in balanced panel observations for each sampled bank across five years.

The population comprises all banking firms listed in the IDX ESG Leaders Index during the observation period. The sample is determined using purposive sampling with the following criteria: the bank is consistently included in the IDX ESG Leaders Index during 2020–2024; annual reports, sustainability reports, or both are available for each year; audited financial statement data are complete to compute ROA, ROE, NPM, and EPS; and the bank does not experience delisting or major corporate restructuring that materially disrupts data comparability. All banks meeting these criteria are included, resulting in a final sample of 10 banks observed over five years, yielding 50 firm year observations. Because the study covers all eligible banks within the index and period, sample size determination follows a full coverage approach rather than a statistical power based estimation.

Data are collected from secondary sources. ESG disclosure data are obtained through document based content analysis of annual reports and sustainability reports, while financial variables are derived from audited financial statements published through the Indonesia Stock Exchange and official issuer disclosures. ESG disclosure is measured using a structured binary checklist consisting of 15 indicators, comprising 5 environmental, 5 social, and 5 governance indicators. Each indicator is coded 1 if disclosed and 0 otherwise, and each dimension score is computed as the proportion of disclosed items within the corresponding dimension, with values ranging from 0 to 1. Financial performance is proxied by Return on Assets, Return on Equity, Net Profit Margin, and Earnings per Share, while firm size is measured as the natural logarithm of total assets.

Data analysis is conducted using moderated regression analysis to test both direct and conditional relationships between ESG disclosure and financial performance.

This approach allows the examination of both the direct effects of ESG dimensions and the moderating role of firm size within the same empirical framework (Ahmad et al., 2023; Al-ahdal et al., 2023). The baseline model estimates the effects of Environmental, Social, and Governance disclosure on financial performance, while the moderation model adds firm size and interaction terms between each disclosure dimension and firm size. Prior to statistical inference, several diagnostic tests were conducted to evaluate the assumptions underlying regression analysis, including multicollinearity, residual distribution, heteroskedasticity, and autocorrelation. These diagnostic procedures are commonly applied in empirical studies examining the relationship between ESG disclosure and firm performance to ensure the robustness and reliability of regression estimates (Huang, 2021; Narula et al., 2024). Specifically, residual normality was assessed using the Shapiro-Wilk test, heteroskedasticity was evaluated using the Glejser test, autocorrelation patterns were described using the Durbin-Watson statistic, and multicollinearity was assessed using variance inflation factors. In addition, a robustness check was performed using bootstrap-based inference with bias-corrected and accelerated (BCa) 95% confidence intervals for ESG_TOTAL and its interaction with firm size to strengthen the reliability of the statistical results (Maji & Lohia, 2023; Narula et al., 2024). Statistical analyses are performed using IBM SPSS Statistics version 23.

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RESULTS AND DISCUSSION

Descriptive Statistics

Descriptive statistics are used to summarize and describe the basic characteristics of the variables included in a study. This analysis provides an overview of the data distribution by presenting measures such as minimum values, maximum values, means, and standard deviations, which help researchers understand the general patterns and variability of the observed variables (D. Z. X. Huang, 2021; R. Narula et al., 2024). In studies examining environmental, social, and governance (ESG) disclosure and firm performance, descriptive statistics also help illustrate the overall tendencies of ESG reporting practices and financial indicators before conducting further statistical analysis.

Table 1 presents the descriptive statistics for all variables used in this study, including Environmental Disclosure (ED), Social Disclosure (SD), Governance Disclosure (GD), the composite ESG score (ESG_TOTAL), financial performance indicators (ROA, ROE, NPM, and EPS), and firm size measured using the natural logarithm of total assets.

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Table 1
Descriptive Statistics (N = 50)

Variable	N	Min	Max	Mean	Std. Dev.
ED	50	2.00	5.00	4.48	0.839
SD	50	1.00	5.00	4.72	0.834
GD	50	2.00	5.00	4.80	0.639
ESG_TOTAL	50	7.00	15.00	14.00	1.852
ROA	50	-8.52	8.41	1.898	2.287
ROE	50	-15.07	29.88	12.037	7.501
NPM	50	-206.90	50.64	21.495	35.134
EPS	50	-17.11	1101.07	296.370	268.642
FIRM_SIZE_LN	50	7.69	14.70	12.670	1.721

Source: Processed data, 2025

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Table 1 reports the descriptive statistics for all study variables (N = 50). Overall, ESG disclosure scores are relatively high, with mean values close to the upper end of the

measurement scale for Environmental Disclosure (ED = 4.48), Social Disclosure (SD = 4.72), and Governance Disclosure (GD = 4.80). The aggregated ESG measure also indicates high disclosure intensity, with a mean of 14.00 and a range of 7–15.

In contrast, financial performance indicators exhibit substantial heterogeneity across banks and years. ROA ranges from –8.52 to 8.41, with a mean of 1.898, while ROE ranges from –15.07 to 29.88, with a mean of 12.037. Dispersion is particularly pronounced for NPM, which ranges from –206.90 to 50.64 (mean = 21.495), and EPS, which ranges from –17.11 to 1101.07 (mean = 296.370). These values indicate that profitability outcomes differ markedly across observations. Firm size also varies meaningfully, with a mean of 12.670 and a range of 7.69–14.70, supporting its role as a contextual factor and a potential moderator in subsequent models.

Classical Assumption Tests and Model Diagnostics

Residual Normality

Residual normality refers to the assumption that the residuals (error terms) of a regression model are normally distributed. This assumption is important because many statistical inference procedures in regression analysis rely on the normal distribution of residuals to ensure the validity and reliability of hypothesis testing results (Huang, 2021; Narula et al., 2024). When residuals are normally distributed, the estimated regression coefficients and associated statistical tests are considered more robust and unbiased. To evaluate this assumption, the Shapiro–Wilk test was employed. The Shapiro–Wilk test examines whether the distribution of residuals significantly deviates from a normal distribution. The decision rule is based on the significance value (p-value): if the p-value is greater than 0.05, the residuals are considered normally distributed, whereas a p-value lower than 0.05 indicates a deviation from normality (Maji & Lohia, 2023).

Table 2 summarizes the results of the Shapiro–Wilk normality test for the residual series generated from the regression models used in this study.

Table 2
Normality of Residuals (Shapiro–Wilk Summary)

Item	Result
Number Of Residual Series Tested	17
Residual Series With P Value < 0.05	15
Conclusion	Residual Normality Is Not Fully Satisfied

Source: Processed data, 2025

Residual normality was assessed using the Shapiro–Wilk test across 17 residual series. Of these, 15 series produce p values below 0.05, indicating that the normality assumption is not satisfied for most model specifications. This diagnostic suggests that strict OLS based inference that relies on normally distributed residuals should be interpreted cautiously. Accordingly, the results are discussed by emphasizing coefficient direction, significance patterns, and complementary evidence from diagnostic checks and robustness oriented analyses.

Heteroskedasticity (Glejser Test)

Heteroskedasticity refers to a condition in regression analysis where the variance of the error terms is not constant across observations. In classical linear regression, one of the key assumptions is homoskedasticity, meaning that the variance of the residuals remains constant for all levels of the independent variables. When

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heteroskedasticity occurs, the estimated regression coefficients remain unbiased but the standard errors may become inefficient, which can lead to unreliable statistical inference and hypothesis testing (Alkaraan et al., 2022; Sciarelli et al., 2021). To detect the presence of heteroskedasticity, this study applies the Glejser test. In this procedure, the absolute values of the regression residuals are regressed on the independent variables. If the independent variables significantly explain the absolute residual values, heteroskedasticity is indicated. The decision rule is based on the significance level of the regression coefficients: a p-value greater than 0.05 indicates the absence of heteroskedasticity, whereas a p-value lower than 0.05 suggests the presence of heteroskedasticity in the model (Akhter et al., 2023; Al-ahdal et al., 2023).

The results of the heteroskedasticity test using the Glejser method for each regression model are presented in Table 3.

Table 3
Heteroskedasticity Test (Glejser), Significant Predictors ($p < 0.05$)

Dependent Variable	Significant Predictor	P Value
ROA	Zscore(ED)	0.036
ROA	Zscore(SD)	0.032
ROA	ZEDxZSIZE	0.001
ROA	ZSDxZSIZE	0.014
ROA	ZGDxZSIZE	0.029
ROE	ZEDxZSIZE	0.025
NPM	Zscore(SD)	0.024
NPM	ZEDxZSIZE	0.002
NPM	ZSDxZSIZE	0.024
NPM	ZGDxZSIZE	0.016
EPS	None	

Source: Processed data, 2025

The Glejser test provides evidence of heteroskedasticity in multiple specifications, particularly for ROA and NPM. For the ROA model, significant predictors include Zscore(ED) ($p = 0.036$) and Zscore(SD) ($p = 0.032$). Heteroskedasticity is also indicated by significant interaction terms, namely ZEDxZSIZE ($p = 0.001$), ZSDxZSIZE ($p = 0.014$), and ZGDxZSIZE ($p = 0.029$), suggesting that error variance is not constant in this specification.

For the ROE model, heteroskedasticity is indicated by ZEDxZSIZE ($p = 0.025$). For the NPM model, significant predictors include Zscore(SD) ($p = 0.024$) and interaction terms ZEDxZSIZE ($p = 0.002$), ZSDxZSIZE ($p = 0.024$), and ZGDxZSIZE ($p = 0.016$). By contrast, no significant Glejser predictors are detected for EPS, suggesting comparatively more stable variance in that specification.

Overall, these findings imply that heteroskedasticity may affect standard errors in several models. Therefore, the results should be interpreted with attention to consistency across specifications and supported by complementary robustness evidence.

Autocorrelation Diagnostic (Durbin-Watson)

Autocorrelation refers to a condition in regression analysis where the residuals are correlated with one another across observations. In classical linear regression models, one of the key assumptions is that the error terms are independent. When autocorrelation occurs, the residuals from one observation are systematically related to the residuals of another observation. This situation can lead to inefficient parameter estimates and biased standard errors, which may distort statistical inference in empirical

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research (Mahajan et al., 2023; Shim et al., 2021). To detect the presence of autocorrelation in the regression model, this study employs the Durbin–Watson (DW) statistic. The Durbin–Watson test evaluates the correlation between adjacent residuals in the regression model. The value of the Durbin–Watson statistic ranges from 0 to 4. A value close to 2 indicates that there is no autocorrelation in the residuals. A value substantially below 2 suggests positive autocorrelation, whereas a value substantially above 2 indicates negative autocorrelation (Pereira & Martins, 2021; Purnomo et al., 2023).

The Durbin–Watson statistics for each regression model in this study are summarized in Table 4.

Table 4
Durbin–Watson Statistic

Dependent Variable	Model (1)	Model (2)
ROA	1.346	0.987
ROE	1.263	1.307
NPM	1.838	1.652
EPS	1.306	1.394

Source: Processed data, 2025

Durbin–Watson statistics are reported as supplementary diagnostics to describe potential serial correlation patterns in the residuals. For ROA, the values are 1.346 for Model (1) and 0.987 for Model (2). For ROE, the corresponding values are 1.263 and 1.307. NPM records 1.838 for Model (1) and 1.652 for Model (2), while EPS shows 1.306 and 1.394. Although these statistics are not used as the primary basis for hypothesis conclusions, they provide additional context regarding residual behavior and support a cautious interpretation of coefficient inference.

Multicollinearity Diagnostic (VIF Summary)

Multicollinearity refers to a condition in regression analysis in which two or more independent variables are highly correlated with each other. When such correlations exist, it becomes difficult to distinguish the individual contribution of each explanatory variable to the dependent variable. Although multicollinearity does not bias the regression coefficients, it may increase the standard errors of the estimates and reduce the reliability of statistical inference in empirical models (Huang, 2021; Maji & Lohia, 2023). To detect multicollinearity, this study applies the Variance Inflation Factor (VIF). The VIF indicates how much the variance of an estimated regression coefficient increases because of correlations among the independent variables. A commonly applied rule of thumb suggests that a VIF value below 10 indicates that multicollinearity is not problematic, while a VIF value substantially above 10 signals a high level of multicollinearity that may affect the stability of the regression estimates (Ahmad et al., 2023; Firmansyah et al., 2023).

The summary of the multicollinearity diagnostic results for the regression models used in this study is presented in Table 5.

Table 5
Multicollinearity Diagnostic (VIF Summary)

Model	Vif Range (Reported)	Note
MODEL (1)	Approx. 1.48 to 2.08	Low multicollinearity

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MODEL (2)	Increases substantially (example vif for zscore(sd) approx. 31.78)	Interaction terms may inflate VIF
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Source: Processed data, 2025

Multicollinearity diagnostics indicate that Model (1) is not exposed to serious collinearity concerns, as VIF values range approximately from 1.48 to 2.08. In Model (2), VIF values increase substantially. For example, the VIF for Zscore(SD) is approximately 31.78. This inflation is commonly observed in moderated regression because interaction terms tend to increase collinearity, even when variables are standardized. Therefore, interpretation of Model (2) emphasizes sign consistency, interaction patterns, and overall model fit rather than VIF magnitude alone.

Regression Results

Regression analysis is a statistical technique used to examine the relationship between one dependent variable and several independent variables. The purpose of applying regression in empirical research is to estimate the magnitude and direction of the relationship between explanatory variables and outcome variables, as well as to determine whether these relationships are statistically significant. In studies examining environmental, social, and governance (ESG) practices, regression models are commonly used to evaluate how ESG disclosures influence corporate financial performance indicators (Huang, 2021; Narula et al., 2024).

This study estimates two regression specifications to analyze the relationship between ESG disclosures and firm financial performance. Model (1) represents the baseline model that evaluates the direct effects of Environmental Disclosure (ED), Social Disclosure (SD), Governance Disclosure (GD), and firm size on financial performance indicators. Model (2) extends the baseline specification by incorporating interaction terms between ESG disclosure variables and firm size. The inclusion of interaction variables allows the analysis to test whether firm size moderates the relationship between ESG disclosures and firm financial performance (Ahmad et al., 2023; Al-ahdal et al., 2023).

Model 1: Main Effects (ED, SD, GD, Firm Size)

Model (1) evaluates the direct relationship between ESG disclosure dimensions and firm financial performance without considering moderating effects. In this specification, ED, SD, GD, and firm size are treated as independent variables that directly influence financial performance indicators. Such baseline models are widely applied in ESG-performance research to identify whether sustainability-related disclosures have a measurable effect on corporate financial outcomes (Arvidsson & Dumay, 2022; Maji & Lohia, 2023).

The estimation results for the baseline regression model are summarized in Table 6.

Table 6
Regression Results for Model (1)

Variable	ROA	ROE	NPM	EPS
Constant	-3.123 (-1.127)	-25.278*** (-3.222)	-137.669*** (-3.715)	-957.328*** (-3.440)
ED	0.735 (1.613)	1.684 (1.305)	9.432 (1.547)	1.802 (0.039)
SD	0.445 (0.819)	1.599 (1.040)	-4.637 (-0.639)	-9.317 (-0.171)
GD	0.678 (1.016)	1.968 (1.042)	3.833 (0.430)	18.100 (0.270)

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Firm_Size_Ln	-0.286 (-1.152)	1.009 (1.434)	9.502*** (2.861)	94.924*** (3.806)
Observations	50	50	50	50
R Squared	0.151	0.367	0.356	0.379
Adjusted R Squared	0.075	0.311	0.299	0.324
F Statistic	1.993	6.528	6.229	6.873
Durbin Watson	1.346	1.263	1.838	1.306

Note: values in parentheses are t statistics. Significance: *** p < 0.01; ** p < 0.05; * p < 0.10.
Source: Processed data, 2025

In Model (1), none of the ESG disclosure dimensions are statistically significant predictors of ROA. The coefficients are ED (B = 0.735; t = 1.613), SD (B = 0.445; t = 0.819), and GD (B = 0.678; t = 1.016). Firm size is also insignificant (B = -0.286; t = -1.152). The ROA model explains limited variance ($R^2 = 0.151$; adjusted $R^2 = 0.075$), and overall model fit is weak (F = 1.993). This pattern suggests that ROA variation is not well captured by these predictors in the baseline specification.

For ROE, the constant term is negative and significant (B = -25.278; t = -3.222; p < 0.01). However, ED (B = 1.684; t = 1.305), SD (B = 1.599; t = 1.040), GD (B = 1.968; t = 1.042), and firm size (B = 1.009; t = 1.434) remain statistically insignificant. The ROE model shows moderate fit ($R^2 = 0.367$; adjusted $R^2 = 0.311$) and is jointly significant (F = 6.528). This indicates that ROE is more predictable at the model level, even though individual ESG dimensions do not exhibit significant effects on their own.

For NPM, firm size is the only significant predictor (B = 9.502; t = 2.861; p < 0.01). In contrast, ED (B = 9.432; t = 1.547), SD (B = -4.637; t = -0.639), and GD (B = 3.833; t = 0.430) are insignificant. The model fit statistics are $R^2 = 0.356$ and F = 6.229.

For EPS, firm size remains strongly positive and significant (B = 94.924; t = 3.806; p < 0.01). Meanwhile, ED (B = 1.802; t = 0.039), SD (B = -9.317; t = -0.171), and GD (B = 18.100; t = 0.270) are insignificant. The model fit statistics are $R^2 = 0.379$ and F = 6.873.

Collectively, these findings suggest that firm size is more consistently associated with financial performance, particularly for NPM and EPS, than the disaggregated ESG disclosure dimensions in the baseline models.

Model 2 (Moderation Model): Interaction Effects of ESG Dimensions and Firm Size

Model (2) extends the baseline model by incorporating interaction terms between ESG disclosure variables and firm size. The purpose of including interaction variables is to evaluate whether the influence of ESG disclosures on financial performance varies depending on the size of the firm. Moderation models are commonly used in corporate governance and sustainability research to test whether firm characteristics strengthen or weaken the relationship between ESG practices and firm performance (Akhter et al., 2023; Firmansyah et al., 2023)

The regression results for the moderation model are presented in Table 7.

Table 7
Regression Results for Model (2)

Variable	ROA	ROE	NPM	EPS
CONSTANT	3.361*** (6.619)	15.462*** (9.255)	37.639*** (8.172)	271.909*** (4.238)
ED	0.482 (1.351)	1.746 (1.488)	-0.260 (-0.080)	15.984 (0.355)
SD	-1.592 (-1.112)	-4.484 (-0.952)	-12.494 (-0.963)	-2.120 (-0.012)

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GD	-1.108 (-1.438)	-3.148 (-1.242)	-6.792 (-0.972)	26.932 (0.277)
Firm_Size_Ln	-0.433 (-1.060)	2.454* (1.823)	11.012*** (2.968)	173.552*** (3.358)
ZEDXZSIZE	-0.556 (-1.636)	0.107 (0.096)	-20.620*** (-6.686)	35.631 (0.829)
ZSDXZSIZE	-1.142 (-1.349)	-3.356 (-1.205)	-5.279 (-0.688)	3.474 (0.032)
ZGDxZSIZE	-1.163** (-2.085)	-3.573* (-1.948)	-4.409 (-0.872)	6.921 (0.098)
Observations	50	50	50	50
R Squared	0.483	0.479	0.820	0.401
Adjusted R Squared	0.396	0.392	0.790	0.302
F Statistic	5.597	5.522	27.259	4.022
Durbin Watson	0.987	1.307	1.652	1.394

Note: values in parentheses are t statistics. Significance: *** p < 0.01; ** p < 0.05; * p < 0.10.
Source: Processed data, 2025

In Model (2), moderation evidence differs across performance proxies, suggesting that conditional effects may be specific to the performance measure. For ROA, the interaction between governance disclosure and firm size is negative and significant (ZGDxZSIZE B = -1.163; t = -2.085; p < 0.05), indicating that the marginal association of governance disclosure with ROA weakens as firm size increases. The interaction between ED and firm size is negative but not significant (ZEDxZSIZE B = -0.556; t = -1.636). The interaction between SD and firm size is also not significant (ZSDxZSIZE B = -1.142; t = -1.349). Model fit improves relative to the baseline for ROA ($R^2 = 0.483$; adjusted $R^2 = 0.396$; F = 5.597), implying that including interaction terms provides additional explanatory power.

For ROE, firm size shows marginal significance (B = 2.454; t = 1.823; p < 0.10). The interaction between governance disclosure and firm size is also marginal and negative (ZGDxZSIZE B = -3.573; t = -1.948; p < 0.10), while the other interaction terms remain statistically insignificant.

For NPM, the strongest moderation effect appears in the interaction between ED and firm size, which is negative and highly significant (ZEDxZSIZE B = -20.620; t = -6.686; p < 0.01). Firm size also remains positive and significant (B = 11.012; t = 2.968; p < 0.01). This specification achieves very high explanatory power ($R^2 = 0.820$; adjusted $R^2 = 0.790$; F = 27.259), indicating that the moderation structure is particularly informative for NPM.

For EPS, firm size remains strongly positive and significant (B = 173.552; t = 3.358; p < 0.01). In contrast, ESG main effects and interaction terms are not statistically supported, suggesting that EPS in this model is driven more by scale than by variation in ESG disclosure.

Robustness Check: Bootstrap Estimates for ESG Total (BCa 95% Confidence Interval)

To make the inference more robust against deviations from classical assumptions, a bootstrap test was conducted to evaluate the relationship between ESG_TOTAL and financial performance, as well as the potential moderating effect of firm size. Bootstrap resampling is widely applied in empirical financial and sustainability research to obtain more reliable parameter estimates and confidence intervals when the underlying data may deviate from standard regression assumptions (Akhter et al., 2023; Arvidsson & Dumay, 2022). In this robustness test, the bootstrap estimation results are presented in two panels. Panel A evaluates the direct effects of ESG_TOTAL and firm size on financial performance indicators. Meanwhile, Panel B examines the moderating role

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of firm size by including the interaction term between ESG_TOTAL and firm size (ESG_TOTAL $\times$ Firm Size). This two-panel specification allows the analysis to compare the baseline ESG-performance relationship with the model that incorporates moderation effects (Al-ahdal et al., 2023; Firmansyah et al., 2023).

Panel A: Direct Effects

Panel A reports the bootstrap estimation results for the direct relationship between ESG_TOTAL and financial performance indicators, including ROA, ROE, NPM, and EPS. This model focuses on the main effects of ESG_TOTAL and firm size without incorporating interaction variables.

The detailed bootstrap results for the direct-effect model are presented in Table 8.

Table 8
Bootstrap BCa 95% CI Panel A (ESG_TOTAL and Financial Performance)

Variable	ROA	ROE	NPM	EPS
Constant	1.898*** [p = 0.001; CI 1.262–2.432]	12.037*** [p < 0.001; CI 10.657–14.734]	21.495*** [p = 0.007; CI 10.402–28.030]	296.370*** [p < 0.001; CI 215.052–377.281]
Z(ESG_TOTAL)	1.124* [p = 0.054; CI 0.240–2.143]	3.138** [p = 0.014; CI 0.732–6.605]	4.325 [p = 0.489; CI -1.982–15.186]	-8.918 [p = 0.843; CI -115.315–115.466]
Z(FIRM_SIZE_LN)	-0.488 [p = 0.547; CI -1.626–1.062]	-0.954 [p = 0.643; CI -5.158–1.791]	16.826 [p = 0.359; CI 3.392–34.861]	130.953*** [p = 0.002; CI 59.462–259.444]

.Source: Processed data, 2025

Bootstrap inference provides complementary evidence for the aggregated ESG measure. ESG_TOTAL shows marginal support for ROA (B = 1.124; p = 0.054; BCa 95% CI from 0.240 to 2.143) and significant support for ROE (B = 3.138; p = 0.014; BCa 95% CI from 0.732 to 6.605). In contrast, the association is not supported for NPM (p = 0.489) and EPS (p = 0.843), as the confidence intervals include zero.

Panel B: Moderation (ESG_TOTAL $\times$ Firm Size)

Panel B extends the bootstrap analysis by incorporating the interaction term between ESG_TOTAL and firm size in order to evaluate whether firm size moderates the relationship between ESG performance and financial performance indicators.

The bootstrap estimation results for the moderation model are summarized in Table 9.

Table 9
Bootstrap BCa 95% CI Panel B (Moderation via ESG_TOTAL $\times$ Firm Size)

Variable	ROA	ROE	NPM	EPS
Constant	2.790*** [p = 0.002; CI 2.039–3.265]	13.594*** [p < 0.001; CI 11.895–14.822]	36.123*** [p = 0.001; CI 25.673–44.191]	267.785*** [p < 0.001; CI 208.654–335.936]
Z(ESG_TOTAL)	-0.517 [p = 0.598; CI -2.471–1.543]	0.357 [p = 0.827; CI -2.962–4.893]	-22.581 [p = 0.388; CI -59.423–6.772]	57.444 [p = 0.202; CI -72.942–134.722]

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Z(FIRM_SIZE_LN)	-0.489 [p = 0.442; CI -1.492–0.508]	1.709 [p = 0.266; CI -1.110–4.758]	16.800 [p = 0.302; CI 4.167–25.670]	162.010*** [p = 0.003; CI 91.982–286.891]
Z(ESG_TOTAL×SIZE)	-1.367* [p = 0.074; CI -2.453–0.264]	-2.386* [p = 0.060; CI -4.840–1.550]	-22.417 [p = 0.348; CI -39.714–1.109]	43.805 [p = 0.137; CI -41.565–110.098]

Source: Processed data, 2025

After the interaction term is introduced, the direct effect of ESG_TOTAL becomes statistically insignificant across outcomes. The interaction term ZESG×ZSIZE is negative and only marginal for ROA ($B = -1.367$; $p = 0.074$) and ROE ($B = -2.386$; $p = 0.060$). However, the BCa confidence intervals include zero, indicating that moderation evidence is suggestive rather than definitive. Firm size remains strongly positive for EPS ($B = 162.010$; $p = 0.003$; BCa 95% CI from 91.982 to 286.891), reinforcing the consistent role of scale in explaining EPS.

Hypothesis Testing

Hypothesis testing indicates that the direct effects of ESG disclosure dimensions on financial performance are largely weak in the baseline specification. Moderation testing suggests that firm size conditions selected relationships between ESG disclosure and performance. The results also show that the magnitude and significance of ESG effects differ across performance proxies, implying that ESG disclosure may be financially material only under certain performance definitions and organizational contexts.

First Hypothesis (H1): Environmental Disclosure positively affects financial performance

H1 is not supported. Environmental Disclosure (ED) is statistically insignificant across all baseline models, including ROA ($t = 1.613$), ROE ($t = 1.305$), NPM ($t = 1.547$), and EPS ($t = 0.039$). This finding suggests that environmental disclosure, when captured as a disclosure dimension, does not automatically translate into short term improvements in profitability or earnings per share during the observation period.

Second Hypothesis (H2): Social Disclosure positively affects financial performance

H2 is not supported. Social Disclosure (SD) shows no significant association with ROA ($t = 0.819$), ROE ($t = 1.040$), NPM ($t = -0.639$), or EPS ($t = -0.171$). This implies that the benefits of social disclosure may be reputational or relational in nature and may require longer horizons or alternative outcome measures to be reflected in accounting performance.

Third Hypothesis (H3): Governance Disclosure positively affects financial performance

H3 is not supported in the main effects model. Governance Disclosure (GD) is insignificant for ROA ($t = 1.016$), ROE ($t = 1.042$), NPM ($t = 0.430$), and EPS ($t = 0.270$). However, governance disclosure becomes relevant under moderation testing (H7), indicating that its financial implications may depend on bank size and associated monitoring or compliance intensity.

Fourth Hypothesis (H4): ESG disclosure jointly affects financial performance

H4 receives partial support, depending on how ESG is operationalized. In the disaggregated baseline model, ED, SD, and GD do not show individually significant effects,

implying weak direct evidence for a joint ESG effect in that specification. However, robustness inference using the composite ESG_TOTAL indicates a positive association with ROA at marginal significance ($p = 0.054$) and a significant association with ROE ($p = 0.014$), while remaining insignificant for NPM ($p = 0.489$) and EPS ($p = 0.843$). This pattern suggests that a composite ESG signal may be more closely reflected in asset and equity based profitability than in margin based or earnings per share measures.

Fifth Hypothesis (H5): Firm size moderates the effect of Environmental Disclosure on financial performance

H5 is supported for NPM but not for other proxies. The interaction between ED and firm size is negative and strongly significant for NPM ($ZED \times ZSIZE$: $t = -6.686$; $p < 0.01$), indicating that the association between environmental disclosure and margin profitability becomes weaker, or more adverse, as firm size increases. For ROA ($t = -1.636$), ROE ($t = 0.096$), and EPS ($t = 0.829$), the moderation effect is not supported. Substantively, this suggests that larger banks may face higher environmental compliance, reporting, or implementation costs that are more visible in profitability margins.

Sixth Hypothesis (H6): Firm size moderates the effect of Social Disclosure on financial performance

H6 is not supported. The interaction between SD and firm size is insignificant for ROA ($t = -1.349$), ROE ($t = -1.205$), NPM ($t = -0.688$), and EPS ($t = 0.032$). This indicates that the financial consequences of social disclosure do not materially differ between larger and smaller banks in this sample, at least under the selected accounting based performance proxies.

Seventh Hypothesis (H7): Firm size moderates the effect of Governance Disclosure on financial performance

H7 receives support for ROA and weak support for ROE. The interaction between GD and firm size is negative and significant for ROA ($ZGD \times ZSIZE$: $t = -2.085$; $p < 0.05$), suggesting that the marginal association of governance disclosure with ROA diminishes as firm size increases. For ROE, the interaction is negative and marginally significant ($t = -1.948$; $p < 0.10$), while it is not supported for NPM ($t = -0.872$) and EPS ($t = 0.098$). This finding implies that, in larger banks, governance related disclosure and monitoring structures may be associated with profitability pressures or tighter constraints that dampen accounting returns.

Eighth Hypothesis (H8): Firm size moderates the effect of overall ESG disclosure on financial performance

H8 is suggestive but not definitive. Bootstrap moderation indicates negative and marginal interaction effects for ROA ($p = 0.074$) and ROE ($p = 0.060$), while the interaction is insignificant for NPM ($p = 0.348$) and EPS ($p = 0.137$). Importantly, the BCa 95% confidence intervals for the ROA and ROE interactions include zero, implying that the moderation evidence does not meet a strict interval based robustness criterion. Therefore, the moderating role of firm size for overall ESG disclosure should be interpreted as indicative rather than conclusive.

Overall Interpretation

Across models, firm size shows a consistently positive association with financial performance in several specifications, particularly for NPM ($t = 2.968$; $p < 0.01$) and EPS

($t = 3.358$; $p < 0.01$) in the moderation model. This pattern indicates that scale advantages remain a primary driver of profitability differences. Meanwhile, the strongest conditional relationship is the negative interaction between ED and firm size for NPM, and the key governance related moderation effect is observed for ROA. Collectively, these findings support the view that ESG disclosure is not uniformly reflected in banking performance, but may become financially relevant under specific firm characteristics and performance definitions.

Discussion

The findings indicate that the relationship between Environmental Disclosure, Social Disclosure, and Governance Disclosure and the financial performance of Indonesian listed banks during 2020–2024 is context dependent and does not consistently appear as a uniform direct effect across performance proxies. In the baseline specifications, the coefficients of ED, SD, and GD are statistically insignificant for ROA, ROE, NPM, and EPS, whereas firm size emerges as a more stable driver of performance in certain models, particularly for NPM and EPS. This pattern suggests that variation in bank performance is more sensitive to scale related characteristics than to differences in ESG disclosure dimensions. In this sample, ESG disclosure scores are relatively high and less dispersed, which may reduce variation and weaken the explanatory power of ESG disclosure in direct tests.

Regarding the direct effect hypotheses, the empirical results do not provide strong support for H1, H2, and H3 because ED, SD, and GD are not significant predictors across the profitability measures in the baseline model. From a theoretical standpoint, this outcome remains plausible in emerging market settings where ESG disclosure may function primarily as a legitimacy and compliance signal rather than an immediately monetizable source of competitive advantage. Stakeholder and legitimacy perspectives posit that firms may expand disclosure to meet regulatory and societal expectations without necessarily generating short term improvements in accounting profitability, particularly when implementation and reporting costs are nontrivial (Arvidsson & Dumay, 2022; Kartika et al., 2023). In addition, prior evidence on ESG and financial performance remains mixed in developing economies, reinforcing the interpretation that the absence of significance can be consistent with institutional conditions, disclosure quality, and time horizon differences (Husada & Handayani, 2021; Narula et al., 2024).

In contrast to the ESG dimensions, firm size shows a positive association with NPM and EPS in the baseline model. This aligns with the argument that larger banks may benefit from economies of scale, broader revenue diversification, and stronger access to funding, which can translate into superior margins and earnings per share. From a resource based view, larger asset bases imply greater internal capacity for efficiency, process improvement, and strengthened risk management systems, which can support performance outcomes (Alkaraan et al., 2022; Fujianti et al., 2024). Accordingly, firm size appears to exert a more dominant influence on profitability variation than disclosure intensity at the dimension level.

For the moderation hypotheses, the results suggest that the role of ESG disclosure may change when conditioned by firm size, although the pattern is not uniform across ESG dimensions and performance proxies. The clearest moderation evidence is observed for NPM through the interaction between ED and firm size, which is negative and highly significant. This indicates that the marginal relationship between ED and NPM diminishes as bank size increases. One plausible interpretation is that, in larger banks, expanded environmental disclosure may coincide with higher compliance, monitoring,

and implementation costs, thereby reducing short term margins. This explanation is consistent with political cost theory, which emphasizes that highly visible firms face greater regulatory and public scrutiny and may bear higher political and compliance costs (Al-ahdal et al., 2023; Fujianti et al., 2024). In addition, the interaction between governance disclosure and firm size shows negative signals for ROA and ROE, implying that, among larger banks, greater governance disclosure is not necessarily accompanied by stronger accounting profitability. This pattern may reflect organizational complexity, additional control processes, and coordination costs. The fact that moderation effects are not consistently supported across all models also accords with the view that ESG becomes financially material only under certain boundary conditions rather than as a universal relationship (Huang, 2021; Ahmad et al., 2023).

When ESG is operationalized as an aggregate construct using ESG_TOTAL, the bootstrap based robustness results provide additional nuance. ESG_TOTAL shows a positive and statistically significant association with ROE and a marginally significant association with ROA, while remaining insignificant for NPM and EPS. This may indicate that return based measures are more responsive to overall sustainability consistency than to separate disclosure pillars, because aggregation can better capture integrated ESG practices and reduce measurement noise at the dimension level. This interpretation is consistent with the view that ESG is a multidimensional construct whose explanatory power may strengthen when treated holistically (Firmansyah et al., 2023). However, after introducing the interaction between ESG_TOTAL and firm size, moderation evidence becomes weaker and remains suggestive rather than definitive. Therefore, claims regarding aggregate moderation should be stated cautiously.

Overall, this study contributes to the ESG literature in emerging markets by underscoring that ESG disclosure in Indonesian banking does not consistently translate into strong direct effects on profitability across multiple accounting proxies. Instead, ESG disclosure may operate through conditional mechanisms that vary by firm size and by the selected performance indicator. The findings reinforce stakeholder and legitimacy arguments that interpret disclosure as accountability and expectation management. At the same time, political cost theory and resource based reasoning help explain why scale can alter the direction or strength of ESG performance linkages. From a practical perspective, bank managers should distinguish between disclosure aimed at compliance and reputation and ESG initiatives designed to create measurable economic value. In addition, sustainability implementation should be accompanied by cost discipline so that potential benefits are not offset by reduced margins, particularly in larger institutions. For regulators and investors, the results highlight the importance of improving disclosure comparability and substance so that ESG information becomes more decision useful rather than primarily symbolic.

Several limitations should be acknowledged. The sample size is relatively limited, and heterogeneity across banks and years may not be fully captured in simple specifications. Diagnostic indications such as residual non normality and heteroskedasticity in some models suggest that inference should be interpreted prudently. Moreover, ESG effects may be delayed, while accounting indicators can reflect costs more quickly than long term benefits. Future research may extend the observation period, apply stronger panel approaches to address unobserved heterogeneity and potential endogeneity, incorporate lag structures to test delayed ESG effects, and examine differences across bank size groups, business models, and more granular measures of disclosure quality.

CONCLUSION AND SUGGESTION

This study finds that Environmental, Social, and Governance disclosure among Indonesian listed banks during 2020 to 2024 does not show a uniformly consistent relationship with accounting based financial performance when each ESG dimension is tested separately. This pattern supports the view that the relationship between ESG disclosure and financial performance is context dependent and may not translate into immediate profitability effects. At the same time, firm size appears to operate as a moderating condition, as the influence of ESG related disclosure tends to weaken for larger banks in several model specifications.

This suggests that differences in organizational capacity, regulatory scrutiny, and sustainability implementation costs across bank sizes may shape how disclosure relates to financial outcomes. By emphasizing the conditional nature of the ESG disclosure relationship in the Indonesian banking context, this study contributes to a more nuanced understanding in which ESG evaluation considers firm characteristics rather than focusing only on disclosure intensity.

Future research is encouraged to extend the observation period and incorporate alternative performance measures that may better capture longer term ESG materiality. Subsequent studies should also refine ESG measurement by focusing on disclosure depth and quality rather than relying only on whether items are reported. In addition, future work may incorporate additional firm level and governance controls to reduce omitted variable bias and test whether the relationship differs across banking business models and regulatory environments. These extensions may strengthen the robustness and interpretability of empirical findings.

REFERENCES