

DOES ESG DISCLOSURE MATTER FOR FINANCIAL PERFORMANCE? THE ROLE OF FIRM AGE³

Corporate sustainability has become an increasingly important global issue, including in developing countries such as Indonesia, alongside growing investor and stakeholder awareness of Environmental, Social, and Governance (ESG) practices. This study examines the effect of ESG disclosure on the financial performance of non-financial firms listed on the Indonesia Stock Exchange (IDX) during the 2020-2023 period. ESG data are obtained from Bloomberg Terminal, while financial performance is measured using Return On Assets (ROA) and Return On Equity (ROE). Firm size and leverage are included as control variables. Using a quantitative approach with multiple linear regression and purposive sampling, the final sample consists of 44 firms with consistent ESG and financial data throughout the observation period. The results show that ESG disclosure has a positive and statistically significant effect on ROA and ROE in the baseline model. After controlling for firm size and leverage, the positive effect on ROA remains significant, whereas the effect on ROE becomes marginally significant. Further analysis indicates that firm age moderates the relationship between ESG disclosure and financial performance, exhibiting a marginal effect on ROA and a statistically significant effect on ROE. These findings support the relevance of signalling theory, stakeholder theory, agency theory, legitimacy theory, and institutional theory within emerging market contexts. Overall, the study contributes to the ESG literature in Indonesia and provides practical insights for managers and policymakers in promoting more transparent and comprehensive sustainability reporting.

*Keywords: ESG; Return on Assets; Return on Equity; Firm Age
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1. Introduction

The increasing global awareness of environmental issues has made it imperative for every business entity to incorporate ESG disclosure into its long-term strategy to ensure business sustainability. Stakeholders now demand that companies operate ethically, socially

¹ Dany Nurahman, Faculty of Economics and Business, Diponegoro University, <https://orcid.org/0009-0003-5001-1322>, email: danynurahman212@alumni.undip.ac.id, danynurahman212@gmail.com.

² Hersugondo Hersugondo, Faculty of Economics and Business, Diponegoro University, <https://orcid.org/0000-0003-3860-3045>, email: hersugondo@lecturer.undip.ac.id.

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responsibly, and environmentally friendly as a commitment to sustainable development. However, in its implementation, companies incur costs to disclose ESG. Therefore, companies must carefully plan the allocation of ESG investments so that the disclosure results in maximum and commensurate returns.

The ESG concept has evolved from the earlier Corporate Social Responsibility (CSR) paradigm into a more structured and measurable framework. Entering the early 2000s, the term ESG began to be recognised as a response to the demand for integrating environmental, social, and organisational management issues into a more comprehensive financial analysis. The UN officially launched the Principles for Responsible Investment (PRI) in 2006 as an effort to encourage the integration of ESG aspects into business decision-making. Climate change, social pressures, and increasingly complex governance issues have become significant drivers in the growing focus on the application of ESG principles in the business world.

ESG encompasses non-financial elements that reflect an organisation's commitment to ecological responsibility, social responsibility, and governance quality, which investors increasingly consider when evaluating corporate performance. Atan et al. (2018) link ESG with signalling theory, which explains that business entities can leverage ESG disclosures to affirm their commitment to sustainability and social value. This strategy plays a role in reducing uncertainty while simultaneously strengthening the company's reputation among investors. Duan et al. (2023) stated that corporate investment in the implementation of ESG practices has the potential to increase company value because it can meet stakeholder expectations, which ultimately enhances support and capital flow.

Since 2010, the number of publications discussing sustainability reporting and ESG disclosure in relation to company performance has consistently increased, with an average annual growth rate of 50.43% (Nyantakyi et al., 2023). However, the bulk of this research originates from developed countries, particularly in Europe and North America (T. T. Li et al., 2021). Research focused on developing countries, including Indonesia, remains limited, with only about 32% of studies emerging from these regions (Mukhtar et al., 2024). In Indonesia, supervisory regulations led by the Financial Services Authority (OJK) have mandated sustainability reporting for publicly listed companies. Despite this, compliance levels and disclosure quality vary widely, reflecting diverse firm capabilities and motivations, which creates uncertainty about the true impact of ESG on financial performance.

Despite the growing attention to ESG, existing studies on its impact on financial performance are inconclusive, particularly in emerging markets. This study aims to examine the influence of ESG disclosure on the financial performance of non-financial companies listed on the Indonesia Stock Exchange (IDX) during 2020-2023, with Return on Assets (ROA) and Return on Equity (ROE) as performance proxies. Moreover, this research investigates the moderating role of firm age, while controlling for firm size and leverage, to provide a nuanced understanding of ESG's financial implications.

By focusing on Indonesia, a rapidly developing market with evolving sustainability regulations, and incorporating firm age as a moderating variable, this study contributes to filling a notable gap in ESG research. The findings are expected to offer guidance for business leaders and regulatory authorities in formulating strategies that integrate sustainability with

financial performance, thereby supporting the long-term resilience and competitiveness of companies in emerging markets.

2. Literature Review

For investors, the transparency of information from companies is very important because it helps them make decisions, especially those related to how economic resources are distributed. One form of disclosure that is gaining increasing attention is non-financial information, such as ESG reports. Investors examine the ESG aspects of a business entity to understand the allocation of funds and the operational methods of the company. This is in line with the Triple Bottom Line (TBL) approach, a framework used to measure a company's sustainable performance from three main perspectives: economic, social, and environmental. This approach was introduced by Elkington (1994) as an effort to balance economic profit with responsibility towards society and ecosystems, thereby creating sustainable long-term growth.

In response to the increasing global concern about sustainability, various international and national regulatory frameworks have been developed to promote ESG disclosure. Globally, standards such as the Sustainability Accounting Standards Board (SASB), the Global Reporting Initiative (GRI), and the Task Force on Climate-related Financial Disclosures (TCFD) have become key references for companies seeking to prepare reliable sustainability reports. More recently, the European Union (EU) introduced the Corporate Sustainability Reporting Directive (CSRD), mandating transparent ESG reporting for large and publicly listed firms. In Indonesia, attention to ESG has also grown. The Financial Services Authority (OJK) has issued several key regulations, including POJK No. 51/POJK.03/2017 on sustainable finance implementation for financial service institutions, issuers, and public companies. Through such regulations, ESG disclosure has shifted from being voluntary to a regulatory requirement, making it an integral part of corporate governance practices in the country.

From a theoretical perspective, Stakeholder Theory argues that corporate sustainability depends on how well firms address the interests of parties involved in their business (Campbell, 2007). Accordingly, ESG disclosure functions as a mechanism of accountability and responsiveness to stakeholder expectations. Yu & Xiao (2022) find that firms with stronger ESG profiles tend to exhibit higher growth than those with weaker profiles, indicating that ESG practices may influence overall market performance. Stakeholder-oriented practices, such as fostering employee satisfaction and maintaining strong supplier relationships, enhance corporate reputation and can translate into improved financial outcomes. Moreover, transparency in ESG issues may contribute to the development of a competitive advantage.

Stakeholders are individuals or groups who can affect or are affected by corporate activities and play a key role in overseeing sustainability-related management, assessment, and reporting processes (McElroy, Engelen, 2012). The rise of stakeholder capitalism has shifted corporate objectives from solely maximising shareholder wealth toward creating long-term value for all stakeholders. Through the application of sound governance and consideration of

environmental and social impacts, firms can better align with stakeholder interests. Consequently, ESG disclosure extends beyond regulatory or reputational motives and serves as a strategic instrument for achieving stakeholder legitimacy and support (Chabachib et al., 2019).

Information imbalance in corporate reporting arises when firms possess superior knowledge of their internal conditions compared to investors and other stakeholders. To reduce this asymmetry, companies must consistently communicate relevant information as business environments evolve (Janney, Folta, 2006). This rationale is consistent with Signalling Theory, which emphasises the transmission of information from firms as signal senders to external stakeholders as signal receivers, followed by market feedback. Corporate disclosures related to long-term sustainability initiatives serve as signals of commitment and credibility, thereby reducing information asymmetry between firms and external parties (Taj, 2016).

Agency theory explains the relationship between shareholders as principals and managers as agents, which is characterised by the separation of ownership and control and may give rise to conflicts of interest (Jensen et al., 1976). Information asymmetry enables managers to pursue personal objectives that may not align with shareholder interests, resulting in agency costs. These costs can be mitigated through effective corporate governance mechanisms, including greater transparency through ESG disclosure. However, while ESG initiatives may enhance credibility and corporate image, excessive resource allocation to ESG activities can increase cost burdens and potentially weaken financial performance (M & Sasidharan, 2020). Accordingly, ESG disclosure should be integrated within a sound governance framework to better align managerial actions with shareholder interests.

Legitimacy theory posits that organisational survival depends on societal approval, which is achieved when corporate activities align with prevailing social values, norms, and expectations (Suchman, 1995). In this context, ESG disclosure functions as a strategic communication mechanism to signal firms' commitment to social and environmental responsibility and to strengthen the social contract with the public and other stakeholders. In the digital era, where media shape public perceptions, proactive dissemination of ESG information enhances legitimacy, reputation, and investor appeal (Le, Chakrabarti, 2023). Such transparency helps alleviate social pressure and supports long-term firm value and financial performance.

ESG disclosure also strengthens corporate image and public trust, as firms seek to validate their societal role through compliance with social standards (Shin et al., 2023). Companies with transparent ESG reporting generally exhibit better performance and lower risk exposure, whereas failure to meet societal expectations may result in regulatory pressure, restricted access to resources, and threats to business continuity (Longenecker et al., 2007).

Organisations are shaped by external institutional forces, including governments, regulators, and social pressures, which influence their responses and decision-making systems (Wukich et al., 2024). Institutional theory argues that organisational survival depends on alignment with prevailing societal expectations and the attainment of external legitimacy (Meyer et al., 2016). Within this framework, DiMaggio & Powell (1991) introduce institutional isomorphism, whereby organisations operating under similar environmental conditions tend to adopt comparable practices. Coercive, mimetic, and normative pressures drive this

process, encouraging firms to adapt policies, systems, and procedures, including ESG implementation.

Recent studies highlight the growing importance of ESG factors as determinants of corporate financial performance (Crespi, Migliavacca, 2020). Intensifying performance pressures heighten competition and managerial challenges, underscoring the need for effective performance monitoring in dynamic markets (Kennerley, Neely, 2003). Financial performance is shaped by internal and external factors, including ESG practices, and is commonly assessed using accounting-based, market-based, or combined indicators (Waddock, Graves, 1997; Jermias, 2008; McGuire et al., 1988). This study adopts accounting-based measures, ROA and ROE, as proxies for financial performance, as they capture operational efficiency and shareholder profitability.

Many studies have tried to find the linkage between overall ESG values and corporate financial results. Previous studies may use various terms such as ESG, ESG disclosure, ESG performance, Corporate Social Responsibility (CSR), sustainability, and other terms that have conceptual relevance in examining corporate sustainability issues. López-Toro et al. (2021) document a positive relationship between ESG and both ROA and ROE, while Nguyen et al. (2022) show that stronger ESG practices contribute to improved financial performance measured by the same indicators. Similarly, Alareeni & Hamdan (2020) find that overall ESG disclosure positively affects ROA and ROE, although results vary across individual ESG components.

A broader synthesis of the literature further supports these findings. L. Li et al. (2024), reviewing 72 studies on ESG and corporate performance, report that positive relationships with ROA and ROE dominate compared to negative or insignificant results. Consistently, Friede et al. (2015), through a meta-analysis of approximately 2,200 empirical studies, conclude that nearly 90% of the evidence shows a nonnegative, predominantly positive, association between ESG and corporate financial performance over time.

On the other hand, a study by Duque-Grisales & Aguilera-Caracuel (2021) found a negative correlation between ESG and ROA. Another study by Shahbaz et al. (2020) found that high CSR performance as measured by ESG scores did not automatically guarantee increased financial performance, either as measured by market or accounting indicators. Pirtea et al. (2021) did not find any strong and consistent relationship between ESG scores and ROA or ROE. Furthermore, Zakirova et al. (2023) found no statistically significant relationship between ESG and ROA. Bahadır & Akarsu (2024) also found that increasing ESG scores are negatively related to financial performance. Although high-ESG firms tend to have lower capital expenditures and higher gross margins, their profitability declines due to insufficient revenue generation relative to their asset size. Another study conducted by Gadekar et al. (2024) showed that the implementation of sustainable business practices did not have a significant impact on the level of company profitability. Thus, the findings in the literature are still varied, and this opens up room for further exploration, especially in developing countries like Indonesia. From this explanation, the following hypothesis can be drawn:

H1: ESG has a positive effect on ROA

H2: ESG has a positive effect on ROE

Beyond the direct effect of ESG on financial performance indicators such as ROA and ROE, internal firm characteristics, particularly firm age, may moderate this relationship. Roberts (1992) highlights firm age and size as key attributes influencing sustainability engagement and the ESG-financial performance nexus. Firm age shapes organisational behaviour and disclosure strategies, as younger firms tend to prioritise financial outcomes over social image, resulting in fewer sustainability initiatives (Yang, Baasandorj, 2017). Firm age also affects internal structures and operational conduct (Kieschnick, Moussawi, 2018), while evidence suggests that older firms may be less motivated to invest in ESG activities (Huarng, Yu, 2024).

Firm age further influences financial performance. Established firms benefit from accumulated experience and superior risk management capabilities (Cho, 2020), yet they also face challenges related to market dynamics, shifting consumer preferences, and potential organisational rigidity, which may erode performance if not offset by innovation (Haneberg, 2021). Consistently, Coad et al. (2013) find that profitability tends to decline as firms age due to lower efficiency in transforming workforce growth into profit, whereas younger firms often exhibit higher growth potential. Accordingly, this study posits that firm age moderates the relationship between ESG and financial performance, proxied by ROA and ROE. Firm age is measured using the logarithmic transformation of firm operational age (Abdi et al., 2022; Cambrea et al., 2025). From this explanation, the following hypothesis can be drawn:

H3: Firm age moderates the relationship between ESG and ROA

H4: Firm age moderates the relationship between ESG and ROE

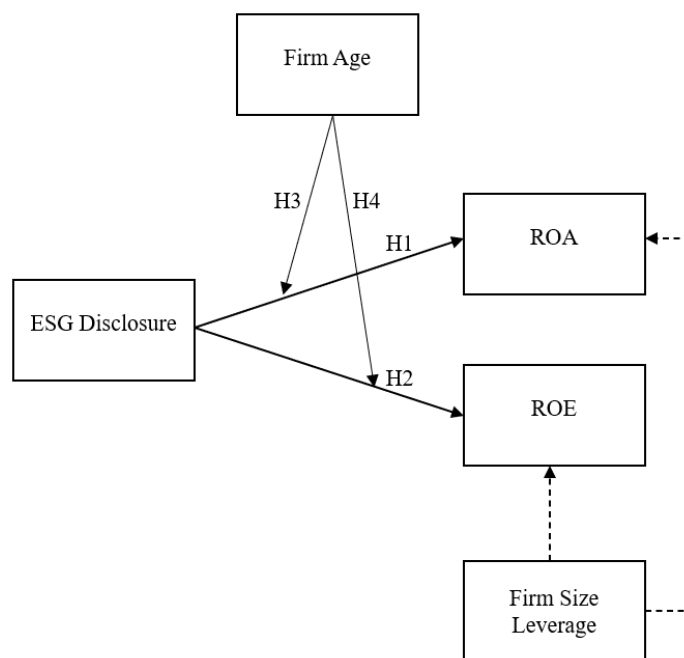
In addition to ESG as the main explanatory variable, firm size is included as a key control variable, as it is widely recognised as an important determinant of financial performance. Larger firms tend to attract greater public scrutiny and face higher expectations regarding social, environmental, and governance responsibilities due to broader shareholder bases and stakeholder visibility. They are also more likely to employ formal and structured communication channels for sustainability reporting. Prior studies suggest that larger firms are better positioned to implement ESG practices effectively and derive greater benefits from such initiatives (Cornett et al., 2016; Rabaya, Saleh, 2022; Gholami et al., 2022)

Empirical evidence further indicates that firm size influences corporate engagement in CSR and ESG activities, supported by economies of scale and access to strategic resources that sustain competitive advantage (Bissoondoyal-Bheenick et al., 2023). Moreover, larger firms face greater societal and civil pressure, reinforcing incentives for ESG disclosure (Drempetic et al., 2020). Accordingly, firm size is commonly employed as a control variable in examining the relationship between ESG disclosure and financial performance (Velte, 2017; Fahad, Busru, 2020; Lunawat, Lunawat, 2022; Zakirova et al., 2023; Firmansyah et al., 2023). Therefore, this study controls for firm size to isolate the effect of ESG on financial performance and mitigate potential bias arising from firm-scale heterogeneity.

Leverage, measured using the Debt to Equity Ratio, is incorporated as a control variable in this study to account for differences in capital structure across firms that may independently influence financial performance, separate from the effects of ESG practices. Leverage is also a commonly used proxy to capture unsystematic risk (Bhaskaran et al., 2020; Ullah et al.,

2022), making it relevant in the ESG context, as firms with higher ESG scores are generally perceived as entities with lower risk levels due to the reputational effects they possess. Furthermore, leverage has the potential to increase ESG disclosure due to pressure from financial institutions as external funders, while also serving as a managerial efficiency tool to enhance firm value through the use of external capital. Therefore, controlling for leverage in this empirical model allows for a more accurate estimation of the connection between ESG and financial performance, as it helps isolate the impact of ESG from financial risk and variations in capital structure. Leverage has also been widely employed in previous studies addressing ESG-related issues and firm performance (Pulino et al., 2022; Ullah et al., 2022; Giannopoulos et al., 2022).

Figure 1. Conceptual Framework



3. Methods

This study is a quantitative study with a causal approach, which aims to test the effect of ESG disclosure on the company's financial performance, which is proxied through two main indicators, namely ROA and ROE. The causal approach is used because this study not only aims to describe the relationship between variables, but also to test the extent to which ESG disclosure can directly affect the company's financial performance.

This study considers as its population all non-financial companies listed on the Indonesia Stock Exchange (IDX) during the period 2020 to 2023. The selection of 2020 as the starting point of the period is based on the increasing attention to sustainability issues that have begun

to influence stakeholder expectations and the global push for ESG transparency. Meanwhile, 2023 was chosen as the end date because it is the last year with stable and comprehensive ESG data available in the Bloomberg Terminal database when the data collection process was carried out.

The sampling technique was carried out using purposive sampling using these criteria: (1) the company consistently published annual reports throughout the study timeframe; (2) the company had a complete composite ESG score during 2020-2023; and (3) the company had never been delisted over the monitoring duration. Established by given requirements, 44 companies were obtained as samples, resulting in a total of 176 observations, thereby forming a balanced panel dataset with both time-series and cross-sectional dimensions.

The explanatory factor of the present investigation is the Bloomberg ESG Composite Score, which indicates the level of corporate disclosure on ESG aspects. This score ranges from 0 to 100, where 0 indicates no disclosure, and 100 indicates complete disclosure. The score is obtained from Bloomberg's evaluation of annual reports, sustainability reports, and other public sources.

The dependent variables consist of ROA and ROE, which each measure the efficiency of a company in generating profits from its assets and capital. ROA is computed from net income relative to total assets, while ROE is computed from net income relative to shareholders' equity. Both indicators are simple and retrospective measures, obtained through calculations based on accounting principles, and are used to measure a company's profitability or productivity from an accounting perspective (Kapopoulos, Lazaretou, 2007).

To maintain the accuracy of the estimation and avoid bias from external factors, this study includes control variables, namely company size and leverage. Company size is estimated by the natural logarithm of total assets, as larger companies tend to have greater capacity in preparing sustainability reports and managing resources. Leverage, quantified by the debt-to-equity ratio, is incorporated to account for the influence of financial structure on company performance. Additionally, firm age is introduced as a moderating variable to examine how the maturity of a company influences the relationship between ESG disclosure and financial performance. The selection of this control variable is based on previous literature showing its influence on the linkage between corporate social responsibility and financial performance (Waddock, Graves, 1997; Elsayed, Paton, 2005).

Testing of the hypothesis is carried out using panel data regression models, incorporating both simple and multiple linear regression techniques. Before estimating the regression model, a panel data model selection test was first conducted to determine the most appropriate approach between the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). After the model was estimated, additional statistical tests were also conducted to assess the strength and validity of the model. The t-test was used to test the significance of each variable coefficient individually. Furthermore, the coefficient of determination (R^2) and adjusted R^2 were also calculated to evaluate the proportion of variation in the dependent variable that can be explained by the model, where adjusted R^2 is used as a more accurate measure in models with more than one independent variable.

To obtain more comprehensive and in-depth results, the analysis was conducted using three regression models. The first model includes only the independent variable, ESG, to examine the direct effect of ESG on financial performance indicators, ROA and ROE, without the influence of other variables. The second model adds control variables, namely firm size and leverage, to account for potential bias arising from firm characteristics. Finally, the third model incorporates the moderating variable, firm age, to explore how firm age influences the relationship between ESG and financial performance. This three-model approach enables a thorough evaluation of the stability and changes in the significance and strength of the ESG – financial performance relationship as control and moderating variables are introduced. The analytical formulas applied for this investigation include, as outlined below:

Regression Model for ROA:

$$ROA_{it} = \beta_0 + \beta_1 ESG_{it} + \varepsilon_{it} \quad (1)$$

$$ROA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 SIZE_{it} + \beta_3 DER_{it} + \varepsilon_{it} \quad (2)$$

$$ROA_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 AGE_{it} + \beta_3 (ESG_{it} \times AGE_{it}) + \beta_4 SIZE_{it} + \beta_5 DER_{it} + \varepsilon_{it} \quad (3)$$

Regression Model for ROE:

$$ROE_{it} = \beta_0 + \beta_1 ESG_{it} + \varepsilon_{it} \quad (4)$$

$$ROE_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 SIZE_{it} + \beta_3 DER_{it} + \varepsilon_{it} \quad (5)$$

$$ROE_{it} = \beta_0 + \beta_1 ESG_{it} + \beta_2 AGE_{it} + \beta_3 (ESG_{it} \times AGE_{it}) + \beta_4 SIZE_{it} + \beta_5 DER_{it} + \varepsilon_{it} \quad (6)$$

Where:

i is firm *i*;

t is year *t*;

ROA_{it} is Return on Assets;

ROE_{it} is Return on Equity;

ESG_{it} is ESG disclosure score;

SIZE_{it} is Firm size;

DER_{it} is Debt to Equity Ratio;

AGE_{it} is Firm age;

ESG_{it} × AGE_{it} is Interaction term between ESG disclosure and firm age;

β₀ is a constant term;

β₁–β₅ is regression coefficients of the respective variables;

ε_{it} is the error term (residual).

To clarify the definition of each variable, the following is a table of operationalisation of the variables in the research:

Table 1. Description of variables

Variable Name	Abbreviation	Measures
Dependent Variables		
Return on assets	ROA	Net income/Total assets x 100 (%)
Return on equity	ROE	Net income/Total equity x 100 (%)
Independent Variable		
ESG disclosure	ESG	ESG composite score, Bloomberg-sourced
Moderating Variable		
Firm Age	AGE	Ln (number of years since the firm began)
Control Variable		
Firm Size	SIZE	Ln (Total Assets)
Leverage	DER	Total debt/Total equity

4. Results

In this study, the selection between the fixed effect model and the random effect model was carried out using the Hausman test. Built on the test outcome showing p values of 0.8162 and 0.9414, it was concluded that the random effect model was more appropriate to use compared to the fixed effect model. This means that the fixed effect model is considered inconsistent, while the random effect model is considered more suitable for the characteristics of the data.

Table 2. Test Results of the Hausman Test

Dependent Variable	Test Summary	Chi-Square Statistic	p-Value
ROA	Random Effect Model	0.054013	0.8162
ROE	Random Effect Model	0.005399	0.9414

Table 3. Descriptive statistics

	Mean	Median	Maximum	Minimum	Std. Dev.
Dependent Variables					
ROA	5.767841	4.49	55.73	-22.3	8.455988
ROE	12.72972	10.76	140.2	-76.18	24.21232
Independent Variable					
ESG	45.88119	45.92	73.87	21.72	10.79776
Moderating Variable					
AGE	3.641509	3.737670	4.499810	2.079442	0.483610
Control Variables					
SIZE	31.09808	31.1626	33.73062	28.3175	1.111413
LEVERAGE	69.90125	42.44	485.74	0	85.73984

Descriptive statistics in Table 3 show that the average ROA is 5.77% with a median of 4.49%. ROE has an average value of 12.73% and a median of 10.76%. The maximum values of ROA and ROE are 55.73% and 140.2%, respectively, while the minimum values are -22.3% and -76.18%, reflecting the variation in financial performance between companies in the sample. The standard deviation of ROA is 8.46, and ROE is 24.21, indicating a significant difference in the level of returns between companies. The average ESG value is 45.88 with a median of 45.92. The range of ESG values is between 21.72 and 73.87, and the standard deviation of

10.80 indicates a moderate level of variation in ESG disclosure between companies. The moderating variable, Firm Age, has a mean value of 3.64 and a median of 3.74. The values range from a minimum of 2.08 to a maximum of 4.50. These values are expressed in natural logarithmic form, representing the number of years since the firm's establishment. The standard deviation of 0.48 indicates a relatively low dispersion in firm age among the sampled companies, suggesting that most firms in the sample have comparable operational histories. For the control variable Firm Size, the average was recorded at 31.10 with a median of 31.16, and the minimum and maximum values were 28.32 and 33.73, respectively. The standard deviation of 1.11 indicates that the firm size in the sample is relatively consistent. As for the control variable Leverage, the mean value is 69.90, with a wide range spanning from 0 to a maximum of 485.74. The median leverage is 42.44, and the standard deviation is notably high at 85.74.

Table 4. Pearson Correlation Matrix

	ESG	ROA	ROE	SIZE	LEVERAGE	AGE
ESG	1.000000					
ROA	0.207929	1.000000				
ROE	0.175629	0.840136	1.000000			
SIZE	0.318222	0.035698	0.063543	1.000000		
LEVERAGE	-0.043706	-0.314546	-0.178738	0.140819	1.000000	
AGE	0.221292	0.066559	0.112137	0.039965	-0.077281	1.000000

Table 4 illustrates the results of the Pearson correlation test between the variables ESG, ROA, ROE, and Firm Size. ESG has a positive correlation with ROA ($r = 0.208$) and ROE ($r = 0.176$), indicating that increased ESG disclosure tends to be followed by increased financial performance, although this relationship is weak. ROA and ROE show a strong correlation ($r = 0.840$), reflecting the natural relationship between financial performance indicators. Meanwhile, Firm Size is positively correlated with ESG ($r = 0.318$), indicating that larger-scale corporations often demonstrate elevated ESG ratings. The correlation of Firm Size with ROA and ROE is very low. Leverage shows a negative correlation with both ROA ($r = -0.315$) and ROE ($r = -0.179$), indicating that higher financial leverage is associated with lower profitability. Leverage also shows a negligible negative correlation with ESG ($r = -0.044$), suggesting that a firm's capital structure has minimal direct association with its ESG disclosure practices.

Additionally, Firm Age shows a weak positive correlation with ESG ($r = 0.221$), ROA ($r = 0.067$), and ROE ($r = 0.112$), suggesting that older firms tend to have slightly better ESG performance and financial outcomes. However, the low correlation values indicate that the effect is not dominant, which supports the appropriateness of testing Firm Age as a moderating variable in the ESG–financial performance relationship. The weak correlation also ensures that multicollinearity is unlikely to pose an issue in the regression analysis involving this moderating variable. These results provide initial support for the existence of an association between ESG disclosure and company performance, and indicate that there is no excessive association between variables that can interfere with further regression analysis.

Table 5. ROA Random Effects Regression Results

	Coefficient	Std.Error	t-Ratio	p-Value
Constant	-2.334955	3.450996	-0.676603	0.4996
ESG	0.176604	0.071520	2.469290	0.0145
Mean dependent variable	2.112439	S.D. dependent variable		5.252638
Sum squared residual	4663.956	S.E. of regression		5.177291
R-squared	0.034035	Durbin-Watson statistic		1.558051
Adjusted R-squared	0.028483	F-statistic		6.130726

The regression results between ESG as an independent variable and ROA as a dependent variable are presented in Table 5. The ESG coefficient is 0.1766 and is statistically significant at the 5% significance level ($p = 0.0145$). This shows that an increase in ESG scores on average is positively correlated with an increase in ROA, so firms exhibiting greater levels of ESG disclosure are likely to show improved financial performance.

However, the R-squared value of 0.0340 demonstrates that ESG variation is only able to explain about 3.4% of the variation in ROA. This indicates that the relationship between ESG and ROA is quantitatively weak, although statistically significant. The Adjusted R-squared value, which is close to R-squared (0.0285), indicates that the model does not experience overfitting, although its contribution to the total variation in ROA is still limited.

The constant coefficient (-2.3349) is not significant ($p = 0.4996$), so it does not demonstrate a meaningful effect on the interpretation of the model. The F-statistic value of 6.1307 reveals that the overall model is significant at the 5% level, so that the linear relationship between ESG and ROA can be accepted within the framework of this model. The Durbin-Watson statistic of 1.5580 is in the range close to the ideal value, indicating that there is no serious problem with residual autocorrelation.

Overall, these results provide initial evidence that ESG Disclosure has a positive and significant relationship to financial performance as measured by ROA, although its effect is still limited in explaining the overall variation in performance. Thus, the outcomes reinforce H1, proposing that ESG has a positive effect on ROA.

Table 6. ROE Random Effects Regression Results

	Coefficient	Std.Error	t-Ratio	p-Value
Constant	-6.065437	9.147965	-0.6630367	0.5082
ESG	0.409648	0.186046	2.201861	0.0290
Mean dependent variable	3.552648	S.D. dependent variable		12.2787
Sum squared residual	25663.95	S.E. of regression		12.14471
R-squared	0.027259	Durbin-Watson statistic		1.721375
Adjusted R-squared	0.021669	F-statistic		4.876062

Table 6 shows the regression results between ESG as an independent variable and ROE as a dependent variable. The ESG coefficient is 0.4096 and is significant at the 5% level of significance ($p = 0.0290$), indicating a positive and significant relationship between ESG disclosure and ROE. This implies that the more elevated the level of ESG disclosure by the company, the higher the return on equity achieved. In contrast, the constant in the model is not significant ($p = 0.5082$) and therefore does not provide substantive meaning in the interpretation of this relationship.

In the descriptive statistics section of the model, the standard deviation value of the dependent variable (12.28) is much higher than its average (3.55), indicating that the ROE value in the sample varies greatly between companies. In terms of model feasibility, the R-squared value of 0.0273 indicates that ESG only explains about 2.7% of the variation in ROE. Although low, the F-statistic value of 4.876 demonstrates that the overall model is significant, and the presence of ESG as a predictor makes a significant contribution to the model. The Durbin-Watson value of 1.72 also indicates that there is no strong autocorrelation in the residuals. Overall, these regression results provide initial evidence that ESG disclosure has a positive and significant effect on corporate financial performance as measured by ROE, although this effect explains a relatively small proportion of the variation. Thus, these results support Hypothesis 2, which states that ESG has a positive effect on ROE.

Table 7. Random Effects Regression Results for ROA and ROE (with Control Variables)

	ROA Coef.	ROA p-value	ROE Coef.	ROE p-value
Constant	-24.01461	0.3689	-89.82649	0.2808
ESG	0.150216	0.0387	0.327459	0.0953
SIZE	0.767300	0.3878	2.899967	0.2930
LEVERAGE	-0.013894	0.0965	-0.037930	0.0877
Mean dependent variable	2.221338	-	3.497712	-
Sum squared residual	4700.963	-	24938.76	-
R-squared	0.098110	-	0.050090	-
Adjusted R-squared	0.034564	-	0.031004	-
S.D. dependent variable	5.320683	-	12.23242	-
S.E. of regression	5.227923	-	12.04129	-
Durbin-Watson statistic	1.552181	-	1.755002	-
F-statistic	3.088414	-	2.866458	-

The difference in results in Table 5 and Table 7 reflects the impact of Firm Size and Leverage as control variables on the relationship between ESG and ROA. In the model without controls (Table 5), ESG has a coefficient of 0.1766 and is significant at the 5% level ($p = 0.0145$). When the Firm Size and Leverage variables are added to the model (Table 7), the ESG coefficient decreases slightly to 0.1502, but remains significant ($p = 0.0387$). This indicates that the positive relationship between ESG and ROA persists even after considering the influence of both firm size and leverage.

The coefficient of the SIZE control variable in Table 7 is 0.7673, though it lacks statistical significance ($p = 0.3878$), indicating that company size does not exert a meaningful impact on ROA in this model. In contrast, the LEVERAGE (DER) variable has a negative coefficient of -0.0139 and is marginally significant at the 10% level ($p = 0.0965$), suggesting a potential inverse relationship between leverage and ROA. This finding implies that higher levels of leverage may reduce profitability as measured by ROA.

Furthermore, the R-squared value increased from 0.0340 (without control variables) to 0.0981 (with controls), and the Adjusted R-squared rose from 0.0285 to 0.0346. This indicates that the inclusion of the control variables SIZE and LEVERAGE provided a moderate improvement in the explanatory power of the model with respect to ROA, although the overall contribution remains relatively limited.

The variation of the results between Table 6 and Table 7 shows the effect of the presence of the Firm Size and Leverage control variables on the relationship between ESG and ROE. In the model without controls (Table 6), ESG has a coefficient of 0.4096 and is significant at the 5% level ($p = 0.0290$). After SIZE and LEVERAGE are included in the model (Table 7), the ESG coefficient decreases to 0.3275, and its significance level weakens ($p = 0.0953$), which means it is no longer significant at the 5% level, but remains within the 10% threshold. Meanwhile, the SIZE variable has a positive coefficient of 2.9000, yet it is statistically insignificant ($p = 0.2930$), indicating that company size fails to significantly affect ROE in this model. However, the LEVERAGE variable again shows a negative coefficient (-0.0379) and is marginally significant ($p = 0.0877$), suggesting that higher leverage may reduce firm performance as measured by ROE.

The R-squared value increased slightly from 0.0273 to 0.0501, while the Adjusted R-squared rose from 0.0217 to 0.0310. These results suggest that the addition of SIZE and LEVERAGE contributed marginally to enhancing the model’s ability to explain variations in ROE, though the overall improvement in model quality remains modest

Drawing from the regression analysis, it is evident that SIZE does not exhibit a statistically significant effect on the relationship between ESG and financial performance, in either the ROA or ROE models. Although the inclusion of this variable, along with Leverage, leads to a slight reduction in the ESG coefficient and its level of significance, the direction of the relationship remains positive and relatively stable. In contrast, LEVERAGE demonstrates a consistently negative relationship with both ROA and ROE, and is marginally significant in both models, indicating a potential role of capital structure in shaping firm financial outcomes. While the addition of both control variables contributes to a slight increase in R-squared values, their overall explanatory power remains limited. Nevertheless, Firm Size is retained in the model due to its theoretical relevance and frequent inclusion in prior studies. Leverage, on the other hand, appears to play a more relevant role in explaining the ESG–financial performance relationship in the context of this study.

Table 8. Regression Results of ESG on ROA with Firm Age as Moderator

	Coefficient	Std.Error	t-Ratio	p-Value
Constant	15.45238	34.01990	0.454216	0.6503
ESG	-0.737096	0.464743	-1.586031	0.1146
SIZE	0.775770	0.867284	0.894481	0.3723
DER	-0.014672	0.008156	-1.798979	0.0738
AGE	-11.20824	6.297963	-1.779661	0.0769
ESG*AGE	0.248772	0.129030	1.928023	0.0555
Mean dependent variable	2.221871	S.D. dependent variable		5.321023
Sum squared residual	4609.288	S.E. of regression		5.207059
R-squared	0.069737	Durbin-Watson statistic		1.570848
Adjusted R-squared	0.042377	F-statistic		2.548819

The panel regression with ROA as the dependent variable shows that ESG no longer has a statistically significant effect on firm profitability after the inclusion of the moderator variable (AGE) and control variables (SIZE and DER), with a p-value of 0.1146 and a negative coefficient. This contrasts with the initial model, where ESG had a significantly positive effect on ROA. This shift can be explained by two main factors. First, the addition

of control variables such as DER and SIZE corrects for potential omitted variable bias, which may have previously overstated ESG's impact. Second, AGE introduces a contextual nuance: older firms may have more rigid structures and bureaucratic processes, which can delay or limit ESG integration. However, most importantly, the interaction term ESG*AGE displays a positive coefficient and is marginally significant ($p = 0.0555$), indicating that Hypothesis 3 – that firm age moderates the relationship between ESG and ROA – cannot be rejected and is empirically supported at the 10% significance level. This suggests that firm age enhances the impact of ESG on ROA, possibly because mature firms have more experience and internal capacity to manage ESG initiatives effectively. Although the R^2 value is relatively low at 0.069, the model contributes meaningfully to theory by highlighting firm age as a critical contextual factor in the ESG–performance relationship.

Table 9. Regression Results of ESG on ROE with Firm Age as Moderator

	Coefficient	Std.Error	t-Ratio	p-Value
Constant	16.95427	96.04731	0.176520	0.8601
ESG	-2.259607	1.206099	-1.873484	0.0627
SIZE	2.906385	2.637491	1.101951	0.2720
DER	-0.038205	0.021627	-1.766509	0.0791
AGE	-30.46449	16.71994	-1.822045	0.0702
ESG*AGE	0.729218	0.337834	2.158512	0.0323
Mean dependent variable	3.658214	S.D. dependent variable		12.36848
Sum squared residual	24804.16	S.E. of regression		12.07919
R-squared	0.073482	Durbin-Watson statistic		1.754321
Adjusted R-squared	0.046232	F-statistic		2.696544

In the regression model with ROE as the dependent variable, ESG shows a negative and marginally significant coefficient ($p = 0.0627$) after including the moderator variable (AGE) and control variables (SIZE and DER), which contrasts with the initial model where ESG had a significantly positive effect on ROE. This suggests that the relationship between ESG and financial performance is not linear but rather contingent upon firm-specific characteristics. DER appears to weaken ESG's impact, possibly due to financial constraints imposed by high leverage. AGE, as a moderator, also shows a negative and nearly significant coefficient ($p = 0.0702$), indicating that older firms may face structural inertia or limited adaptability. Most importantly, the interaction term $ESG \times AGE$ is positive ($\beta = 0.729$) and statistically significant at the 5% level ($p = 0.0323$), supporting Hypothesis H4, that firm age moderates the ESG–ROE relationship. This implies that older, more established firms are better positioned to implement ESG initiatives in ways that enhance financial returns. Although the R^2 value is modest (0.073), the significant interaction term underscores the importance of considering firm age as a key contextual factor when assessing ESG's financial effectiveness.

5. Discussion

The evidence in this investigation presents a crucial contribution in strengthening insights into the linkage between ESG disclosure and corporate financial performance in the context of developing countries, especially Indonesia. In general, the outcomes from the examination

reveal that ESG disclosure has a favourable connection with the two accounting-based financial performance indicators used, namely ROA and ROE, although the strength of the relationship is limited quantitatively. These findings are consistent with previous studies (Alareeni, Hamdan, 2020; López-Toro et al., 2021; Nguyen et al., 2022)

The initial regression results suggest that firms with higher levels of ESG disclosure tend to achieve better financial performance. This supports signalling theory, which posits that ESG disclosure serves as a credible signal of sound governance and effective risk management, thereby enhancing market confidence (Janney, Folta, 2006). The findings also align with stakeholder theory, emphasising that transparent ESG disclosure reflects corporate social responsibility and responsiveness to stakeholder expectations, which strengthens legitimacy and supports long-term stability (Campbell, 2007; McElroy, Engelen, 2012). Furthermore, institutional theory explains ESG disclosure as a response to external pressures from regulators, institutional investors, and global norms. Under mimetic pressure, firms in emerging markets increasingly adopt ESG practices by emulating global peers, although such adoption may not always be accompanied by substantive commitments.

However, the statistical significance found was not followed by high explanatory power in the regression model, as reflected by the low coefficient of determination (R^2) value. This indicates that although ESG contributes positively to ROA and ROE, there are still many other factors outside the model that also shape the company's financial performance. This condition is common in quantitative research based on secondary data, especially in the context of the complexity of financial performance influenced by multidimensional variables.

The inclusion of firm size as a control variable provides additional insights into the ESG–ROA relationship. Although the ESG coefficient declines slightly, it remains statistically significant, indicating that ESG disclosure exerts an independent effect on operational performance regardless of firm size. The insignificance of the SIZE variable further suggests that firm size is not a key determinant of ROA in the ESG context, implying that both small and large firms may benefit from effective sustainability practices.

The LEVERAGE control variable exhibits a negative and marginally significant association with ROA, indicating that higher debt levels may constrain profitability. The inclusion of SIZE and LEVERAGE leads to a modest improvement in model explanatory power, with the R-squared increasing from 0.0340 to 0.0981 and the adjusted R-squared from 0.0285 to 0.0346, reflecting a limited yet observable contribution of the control variables.

In the ESG-ROE relationship, the inclusion of firm size reduces the statistical significance of ESG, although the coefficient remains positive. This suggests partial shared variance between ESG and firm size, which slightly affects estimation precision without altering the direction of the relationship. The insignificance of the SIZE variable in both the ROA and ROE models further indicates that firm size does not function as a dominant determinant of profitability based on accounting measures. These findings contrast with prior studies arguing that larger firms derive greater benefits from ESG disclosure (Cornett et al., 2016; Rabaya, Saleh, 2022; Gholami et al., 2022). However, the results imply that within emerging market contexts, small and medium-sized firms may also benefit from ESG disclosure when it is implemented consistently and credibly.

Alternatively, the LEVERAGE variable continues to show a negative and marginally significant association with ROE as well, indicating its more consistent role as a determinant of financial performance. Nevertheless, the overall increase in explanatory power remains limited, with R-squared increasing from 0.0273 to 0.0501, and Adjusted R-squared from 0.0217 to 0.0310. These findings further confirm that while control variables add some value, the influence of ESG remains relatively robust across model specifications.

The consistent direction of the ESG coefficients that remain positive across all models, both with and without controls, is evidence that sustainability initiatives have a financially beneficial impact, although not always strong or universal. The current findings additionally highlight the significance of ESG disclosure as a strategic tool, not just a normative obligation, in strengthening a company's financial position and reputation, especially amid increasing pressure from investors, regulators, and the global community.

When firm age is treated as an independent variable, it exhibits a marginally significant negative association with financial performance, as reflected in ROA ($t = -1.7797$, $p = 0.0769$) and ROE ($t = -1.8220$, $p = 0.0702$). In contrast, the analysis provides empirical support for Hypotheses 3 and 4, which posit that firm age moderates the relationship between ESG disclosure and financial performance. The positive and significant interaction terms between ESG and firm age in both ROA and ROE models indicate that older firms are better able to convert ESG commitments into improved financial outcomes. These findings suggest that organisational maturity enhances the effectiveness of sustainability strategies, underscoring firm age as an important contextual factor in ESG-performance research. This interpretation aligns with prior evidence that younger firms tend to prioritise short-term financial returns over reputational or social objectives, resulting in lower engagement in sustainability initiatives (Yang, Baasandorj, 2017).

The outcomes within this investigation carry various academic and applied impacts. Theoretically, the outcomes serve as empirical validation of signalling theory, stakeholder theory, and institutional theory in the context of ESG, especially in emerging market environments characterised by limited regulation and a lack of homogeneous reporting standards. Practically, this study suggests that corporate management should not view ESG reporting as merely a burden or additional cost, but rather as a strategic investment that can generate returns in the form of operational efficiency and positive perceptions from stakeholders.

However, this study also has several limitations that need to be considered. First, the financial performance indicators used are limited to an accounting-based approach, so they do not reflect the overall dynamics of the market. Second, this study only considers firm size as the main control variable. Although leverage has also been included, other potentially relevant factors, such as industry classification, ownership structure, or disaggregated ESG components (E, S, and G separately), were not incorporated in the current model.

For further research, it is recommended that the model be expanded by including additional control variables and using market-based performance indicators such as Tobin's Q or Market-to-Book Ratio. In addition, longitudinal research with a more in-depth time-series approach can also reveal the dynamics of ESG's influence on performance more accurately.

Separate ESG sub-component analysis (environmental, social, governance) is also needed to identify which dimensions contribute the most to company profitability.

Furthermore, this study has a contextual limitation related to the national regulatory landscape in Indonesia. Although the analysis is conducted using Indonesian firms, it does not explicitly account for the implications of the Job Creation Law (Law No. 11/2020), commonly referred to as the Omnibus Law, which has been widely debated for introducing deregulatory elements that may weaken environmental and social protections. Such regulatory shifts have the potential to influence firms' incentives to disclose ESG information, alter institutional pressures, and reshape stakeholder expectations regarding sustainability practices. As this study does not model the pre and post regulatory environment nor examine the possible moderating role of the Omnibus Law in the ESG – financial performance nexus, future research is encouraged to incorporate Indonesia's evolving regulatory framework as an important external factor that may significantly shape ESG disclosure behaviour and its implications for firm performance.

6. Conclusion

This study intends to analyse the influence of ESG disclosure on the financial performance of companies in Indonesia, using a quantitative approach based on panel data and proxying financial performance through Return on Assets (ROA) and Return on Equity (ROE). According to the findings of the regression analysis, it was found that ESG has a positive and significant effect on both financial performance indicators, although the explanatory power of the quantitative model is still limited. This finding strengthens the relevance of signalling theory, stakeholder theory, legitimacy theory, agency theory, and institutional theory in explaining the role of ESG as a strategic tool to increase legitimacy, build market trust, and respond to increasingly strong external pressures, especially in the context of emerging markets.

The consistency of the positive relationship between ESG and ROA and ROE, both before and after the addition of control variables in the form of company size, indicates that the benefits of ESG on financial performance are relatively independent of business scale. These results confirm that sustainability initiatives not only benefit large companies but also have the potential to improve the efficiency and reputation of small and medium-sized companies if implemented consistently and transparently. However, the low determination coefficient values (R^2) observed across models indicate that ESG disclosure is not the sole determinant of financial performance. This suggests that other relevant factors, such as market dynamics, industry characteristics, governance structures, and firm-specific strategies, likely play a substantial role and should be integrated into future research frameworks to provide a more comprehensive explanation. Moreover, the inclusion of leverage as an additional control variable further highlights the complex interplay of financial structure and ESG performance, emphasising that a comprehensive approach is essential to fully understand the drivers of corporate financial success.

In addition, the results also confirm Hypotheses 3 and 4, which state that firm age significantly moderates the effect of ESG on ROA and ROE, respectively. The positive and

significant interaction terms demonstrate that older firms are more capable of capturing the financial value of ESG practices, likely due to more developed internal systems, institutional memory, and stakeholder networks. This underscores the importance of considering organisational maturity in designing and evaluating the financial effectiveness of ESG strategies.

Although this study finds a positive relationship between ESG disclosure and financial performance, the quantitative approach employed does not allow for a definitive conclusion about the direction of causality. There is a possibility that firms with higher profitability are better equipped to invest in ESG initiatives, which raises the issue of potential reverse causality. In other words, strong financial performance may drive ESG adoption rather than result from it. This dynamic suggests that the observed relationship should be interpreted as an association rather than a direct causal link. Accordingly, it is important to exercise caution when interpreting the directionality of the findings. Future research is encouraged to apply more advanced econometric techniques, such as two-stage least squares (2SLS) or the Generalised Method of Moments (GMM), to better address endogeneity bias and more accurately isolate the effect of ESG on firm performance.

From an academic perspective, this study provides an empirical contribution to the literature debate on the relationship between ESG and financial performance and enriches ESG studies in the Southeast Asian region, which has so far been underrepresented in global research. In practical terms, these results imply that corporate management should treat ESG reporting as a long-term investment, rather than an administrative obligation, because transparency in sustainability can strengthen competitiveness while building credibility in the eyes of investors and the public. Future research is encouraged to incorporate broader financial metrics, such as market-based indicators, and to explore the differential impacts of the ESG components separately, thereby offering more granular insights for both scholars and practitioners.

Contribution of individual authors

Conceptualisation: Dany Nurahman
Data curation: Day Nurahman
Formal analysis: Dany Nurahman, Hersugondo
Funding acquisition: Dany Nurahman, Hersugondo
Investigation: Dany Nurahman, Hersugondo
Methodology: Dany Nurahman, Hersugondo
Resources: Dany Nurahman
Supervision: Hersugondo
Validation: Dany Nurahman, Hersugondo
Visualisation: Dany Nurahman
Original draft: Dany Nurahman
Review & editing: Dany Nurahman, Hersugondo

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