

The impact of ESG scores on financial performance: Evidence from property and real estate firms listed on the Indonesia Stock Exchange (2020–2024)



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ABSTRACT

This study examines the effect of Environmental, Social, and Governance (ESG) performance on the financial performance of property and real estate companies listed on the Indonesia Stock Exchange during 2020–2024. A quantitative approach was employed using panel data regression analysis to assess the influence of the ESG Overall Score, Environmental Score (ESGE), Social Score (ESGS), and Governance Score (ESGG) on Return on Assets (ROA), with firm size and leverage included as control variables. The results indicate that the ESG Overall Score has a positive and significant effect on ROA, suggesting that firms with stronger ESG performance achieve higher profitability. Furthermore, the environmental, social, and governance dimensions each exhibit positive and significant relationships with financial performance, with the social dimension exerting the strongest influence. These findings support stakeholder theory, demonstrating that effective ESG practices enhance operational sustainability, strengthen stakeholder trust, and improve long-term competitiveness. This study extends the ESG literature by providing empirical evidence from Indonesia's property and real estate sector and highlights the strategic importance of comprehensive ESG implementation in improving corporate financial performance.

Keywords: ESG Score; ROA; Financial Performance; Property and Real Estate Sector ;
Indonesia



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INTRODUCTION

The rapid development of the global economy has prompted a paradigm shift in investment strategies, transitioning from a sole focus on profit maximization to an approach that incorporates sustainability considerations (Ali et al., 2025). Both institutional and retail investors are increasingly factoring in non-financial elements when making investment decisions, recognizing that financial performance alone no longer suffices as the sole indicator of a company's attractiveness. This evolution has contributed to the emergence of the Environmental, Social, and Governance (ESG) framework as a comprehensive global standard for assessing corporate quality (Valaskova et al., 2025). According to a global survey conducted by PwC (2022), 76% of investors actively integrate ESG considerations into their portfolio evaluation processes. Additionally, the Global Sustainable Investment Alliance (GSIA, 2021) reported that the total value of global sustainable investments has reached USD 30.3 trillion. These trends indicate that ESG has transitioned from being merely an ethical consideration to a strategic parameter in modern investment decision-making, reflecting a broader shift towards sustainable and responsible investing practices.

The growing importance of ESG in property and real estate investment has been widely recognised by prominent professional bodies, including the European Public Real Estate Association (EPRA), the Asia Pacific Real Estate Association (APREA), and the Royal Institution of Chartered Surveyors (RICS) (Jamaludin et al., 2025). To ensure consistency in ESG evaluation across property portfolios, several standardised frameworks have been established, most notably the Global Real Estate Sustainability Benchmark (GRESB) and Leadership in Energy and Environmental Design (LEED). Higher ESG ratings are generally linked to greater investor confidence and better access to capital (GRESB, 2019). These frameworks also foster improved transparency and accountability, while helping property developers align their sustainability efforts with the expectations of various stakeholders. At a global level, the real estate sector is responsible for roughly 40% of total energy consumption and 30% of greenhouse gas emissions (UNEP, 2022), highlighting the critical importance of ESG performance in the pursuit of sustainable development goals.

Several notable ESG violations in Indonesia's property and real estate sector further underscore the urgency of this research. From an environmental perspective, the land reclamation case of G Island in Jakarta Bay by PT Agung Podomoro Land Tbk., through its subsidiary PT Muara Wisesa Samudra, highlights environmental violations. The company faced administrative sanctions from the Ministry of Environment and Forestry (KLHK) due to the use of equipment inconsistent with environmental management plans and the absence of clear sand filling permits. This issue persisted for an extended period until resolved by Jakarta Governor Regulation No. 31 of 2022, illustrating how environmental non-compliance can create regulatory uncertainty and diminish investor confidence (Tempo, 2022). From a social perspective, land conflict during the development of Pantai Indah Kapuk 2 (PIK 2) by PT Pantai Indah Kapuk Dua Tbk. reveals significant social risks within ESG implementation. The conflict disrupted local community access and led to the loss of fishing areas due to changes in coastal space and project activities, fueling tensions between business interests and social sustainability (Abdurrahman & Wanusmawatie, 2025). In governance, PT Sentul City Tbk. demonstrates weak corporate governance through a land dispute ongoing for over two decades involving thousands of residents in Bogor, West Java. The issue remains unresolved as of 2024, with inconsistencies in land release documents raising questions about transparency and accountability. Consequently, stakeholder trust has declined, and

reputational risks have increased, emphasizing the importance of strong governance practices to sustain long-term corporate value (Metro Times, 2026).

Table 1 illustrates the strategic position of Indonesia's real estate sector in the context of ESG development across the country. Despite being at a relatively early stage of ESG maturity, this sector holds considerable significance due to the substantial environmental and social consequences associated with construction activities and property development. The sector serves as a meaningful contributor to national economic output, while simultaneously standing as one of the industries with the most pronounced effects on energy use, land utilisation, and carbon emissions. A number of recent regulatory developments, particularly the OJK's mandate for sustainability reporting, reflect Indonesia's broader commitment to meeting international ESG standards. Nevertheless, ongoing weaknesses in reporting uniformity and the absence of sector-wide benchmarks continue to obstruct meaningful ESG measurement and evaluation. This is further evidenced by the relatively small share of Indonesian real estate companies listed on the Indonesia Stock Exchange (IDX) that currently possess verified ESG disclosures.

Table 1
Strategic Position of Indonesia's Property and Real Estate Sector in ESG Adoption

Category	Key Data / Insight	Sources
Market Size	- Indonesia's listed property and real estate sector (IDXPROPERT) comprises ±85 companies with a combined market capitalisation of approximately IDR 330–380 trillion (~USD 21–24 billion) as of 2024. - The commercial real estate market size stands at USD 26.88 billion in 2025 and is projected to reach USD 36.97 billion by 2030 (CAGR 6.58%). - The sector accounts for approximately 2.5–3% of total BEI market capitalisation.	(IDX, 2026; Mordor Intelligence, 2025)
ESG Relevance of Real Estate	- Property and real estate contribute ~40% of global energy use and ~30% of GHG emissions (UNEP, 2022). - In Indonesia, the buildings sector accounts for ~83% of energy demand from buildings (CPI, 2024), with manufacturing and construction representing one of the top three GHG-emitting sectors. - The sector employs approximately 13.8 million workers (~9.6% of the national labour force) and contributes 14.6–16.3% of GDP annually (LPEM FEB UI, 2023).	UNEP (2022); Climate Policy Initiative (2024); LPM FEB UI (2023)
Policy Milestones	- POJK No. 51/POJK.03/2017: mandates sustainability reporting for all issuers and public companies. - OJK Roadmap Keuangan Berkelanjutan Tahap II (2021–2025): strategic guideline for ESG integration. - SE OJK No. 16/SEOJK.04/2021: governs ESG disclosure format in annual reports. - As of 2024, 873 companies (97% of all BEI-listed firms) have submitted sustainability reports (BEI, 2024).	(OJK, 2021); (IDX, 2026)
ESG Reporting Gaps	Despite high submission rates, quality and consistency remain uneven — the main challenges are: (1) lack of quantitative ESG data, (2) limited human	IDX (2026); Mandiri Institute (2024);

Category	Key Data / Insight	Sources
	- resources, and (3) high implementation costs (BEI–Mandiri Institute Survey, 2024). • Mandiri Institute (2023): 60% of listed companies cite high costs, 57% report limited ESG understanding, 55% highlight insufficient regulatory guidance. • ESG scores from Bloomberg Terminal for Indonesia's property and real estate sector remain low (mean ESG Overall Score: 2.68–3.73 on a 10-point scale, 2020–2024), reflecting early-stage adoption.	Bloomberg Terminal
Academic Evidence	• Mixed ESG–financial performance results in Indonesian property and real estate firms: ESG Overall Score shows positive effects on ROA in some studies (Alareeni & Hamdan, 2020; Sandberg et al., 2023) but insignificant or negative effects in others (Helhel et al., 2024; Giannopoulos et al., 2022). • Studies on disaggregated ESG pillars in Indonesia's property and real estate sector remain scarce, underscoring the need for sector-level, pillar-specific analysis (Asih & Kurniawati, 2025; Handoyo & Anas, 2024).	Alareeni & Hamdan, (2020); Helhel et al., (2024); Sandberg et al., (2023)
Regional ESG Position	• Indonesia ranks below Singapore and Malaysia in ESG disclosure maturity in Southeast Asia (Jamaludin et al., 2024). • Singapore and Malaysian developers have integrated ESG metrics more aggressively into capital-raising strategies; Indonesian firms are only beginning to align with frameworks such as GRESB (APREA, 2022). • Indonesia's mandatory ESG disclosure framework positions it as a key policy testbed for emerging market ESG adoption in ASEAN.	APREA,(2022); Jamaludin et al., (2025); OJK (2021)

LITERATURE REVIEW, RESEARCH FRAMEWORK, AND HYPOTHESES

ESG principles have become fundamental in shaping corporate sustainability strategies globally, grounded in Stakeholder Theory (Freeman, 1984). Firms that effectively manage stakeholder interests employees, communities, investors, and regulator are expected to achieve superior long-term financial outcomes by reducing agency costs, mitigating operational risks, and building reputational capital (Aydoğmuş et al., 2022). Consistent with this, Bancu (2024), Koroleva et al. (2020), and Kurniawan (2023) demonstrated that ESG-oriented firms report superior ROA and ROE through stronger stakeholder alignment and enhanced operational discipline.

Return on Assets (ROA) serves as the primary financial performance proxy in this study, favoured for its independence from capital structure distortions and its suitability for capital-intensive sectors such as real estate (Aydoğmuş et al., 2022). Alareeni & Hamdan (2020), Sandberg et al. (2023), and Velte (2023) confirmed a positive ESG–ROA relationship, while Giannopoulos et al. (2022) reported a negative association and Helhel et al. (2024) and Intezar et al. (2024) found no significant link, underscoring the context-dependent nature of this relationship.

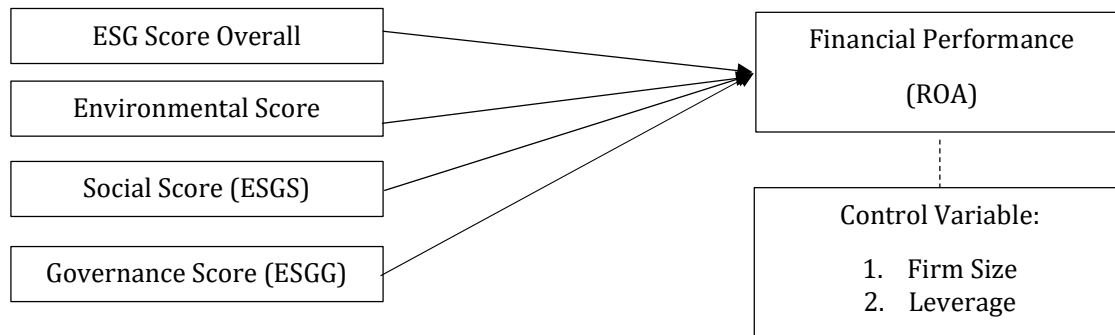
At the pillar level, the environmental dimension captures ecological commitments, including energy efficiency, carbon management, and waste reduction (Baratta et al., 2023). Evidence is mixed: Aydoğmuş et al. (2022) and Naeem et al. (2022) found positive effects on ROA, while Candio (2024), Tabur & Bildik (2025), and Yoon et al. (2024)

reported negative associations attributed to high environmental compliance costs, and Andersen & Bams (2022) found no significant effect. The social dimension encompasses employee welfare, workplace safety, and community engagement (He et al., 2021). Alareeni & Hamdan (2020) and Aydoğmuş et al. (2022) linked higher social scores to improved ROA via reduced labour turnover and community legitimacy, whereas Jin (2025) and Shobhwani & Lodha (2023) reported negative effects and Helhel et al. (2024) and Yoon et al. (2024) found no significant relationship. The governance dimension reflects board composition, executive accountability, audit independence, and anti-corruption mechanisms (Velte, 2023). Al Azizah & Haron (2025), Aydoğmuş et al. (2022), and Candio (2024) confirmed positive governance–ROA effects, while Matsali et al. (2025) found a negative relationship and Handoyo & Anas (2024) found no significant effect in the Indonesian context, suggesting that structural governance limitations in emerging markets may weaken this nexus.

Firm size and financial leverage are incorporated as control variables. Larger firms, proxied by the natural logarithm of total assets, generally demonstrate greater ESG investment capacity and financial stability (Broadstock et al., 2020; Buallay et al., 2020; Husain et al., 2025). High leverage, measured by the debt-to-equity ratio, is consistently associated with lower ROA in the property sector, as excessive debt erodes operating margins and constrains strategic flexibility (Arhinful & Radmehr, 2023; Husain et al., 2025; Sarwar et al., 2022).

Despite the growing body of literature, key gaps persist. Most studies focus on developed markets or cross-country analyses that obscure sector-specific dynamics (Jamaludin et al., 2025), and evidence from Southeast Asian emerging markets particularly Indonesia remains limited (Le, 2024). Many studies also rely solely on aggregate ESG scores rather than pillar-level disaggregation, limiting actionability for managers and policymakers (Aydoğmuş et al., 2022; Biju et al., 2025). The post-COVID-19 period (2020–2024) further represents a structurally distinct environment not yet fully addressed in prior research (Broadstock et al., 2020). This study addresses these gaps by examining ESG pillar-level effects on ROA in Indonesian listed property firms over this period, contributing original evidence on how institutional context and localised ESG maturity shape sustainability–performance relationships in emerging economies.

Figure 1 presents the conceptual framework of this study. The framework positions ESG performance, operationalised through both an aggregate score (ESGO) and three disaggregated pillar scores (ESGE, ESGS, ESGG), as independent variables with hypothesised positive effects on Return on Assets (ROA) as the dependent variable. Firm size (FSIZE) and financial leverage (LEV) are incorporated as control variables based on established evidence that scale economies and capital structure materially influence firm profitability in the property sector (Baltagi, 2021; Husain et al., 2025). The framework is grounded in Stakeholder Theory, which provides the theoretical mechanism linking ESG practices to financial performance through stakeholder value management, reduced agency costs, and enhanced operational legitimacy.



Source: Author's Own Work, 2026

Figure 1
Conceptual Framework

Based on the theoretical arguments from Stakeholder Theory and the empirical evidence reviewed above, this study formulates four directional hypotheses regarding the effect of ESG performance on the Return on Assets of property and real estate companies listed on the Indonesia Stock Exchange.

The first hypothesis concerns the aggregate ESG score. Firms with higher overall ESG performance are theoretically expected to exhibit superior profitability through multiple simultaneous channels: regulatory compliance, stakeholder legitimacy, reduced information asymmetry, and enhanced operational efficiency. This is corroborated empirically by Husain et al. (2025) and Herman et al. (2025), who confirmed positive ESG-ROA relationships in analogous settings. Accordingly:

H1: ESG Overall Score (ESGO) has a positive and significant effect on the Return on Assets (ROA) of property and real estate companies listed on the Indonesia Stock Exchange.

The second hypothesis addresses the environmental pillar. Property development is among the most resource-intensive and environmentally impactful sectors, accounting for a substantial share of construction waste, energy consumption, and land-use change. Firms that proactively manage environmental risks are positioned to reduce compliance costs, avoid project shutdowns, and access green financing premiums, all of which contribute to improved asset returns (Aydoğmuş et al., 2022; Erol et al., 2023). Accordingly:

H2: Environmental Score (ESGE) has a positive and significant effect on the Return on Assets (ROA) of property and real estate companies listed on the Indonesia Stock Exchange.

The third hypothesis pertains to the social pillar. In labour-intensive and community-dependent sectors such as property development, social performance directly affects workforce productivity, workplace safety, and community acceptance of development projects. Firms with strong social practices tend to experience lower employee turnover and fewer project delays due to community conflicts, translating into reduced operational costs and higher (Alhajjeah et al., 2025a; Song, 2024). Accordingly:

H3: Social Score (ESGS) has a positive and significant effect on the Return on Assets (ROA) of property and real estate companies listed on the Indonesia Stock Exchange.

The fourth hypothesis addresses the governance pillar. Sound corporate governance, as reflected in board independence, executive accountability, and transparency of financial reporting, is theoretically associated with reduced agency costs and more efficient allocation of capital toward value-creating activities. These mechanisms are expected to produce measurable improvements in asset productivity over time (Al Azizah & Haron, 2025; Candio, 2024). Accordingly:

H4: Governance Score (ESGG) has a positive and significant effect on the Return on Assets (ROA) of property and real estate companies listed on the Indonesia Stock Exchange.

METHOD

This research employs a classical OLS regression approach alongside robust descriptive statistical and correlation techniques to investigate the relationship between ESG performance and corporate financial performance (Husain et al., 2025). These methods are applied to analyze a dataset drawn from the Bloomberg Terminal, covering five years from 2020 to 2024 and comprising publicly listed property and real estate companies on the Indonesia Stock Exchange (IDX). The study ensures sector-specific relevance by focusing exclusively on companies classified under the IDX Property and Real Estate sector (IDXPROPERT), excluding firms engaged solely in real estate services or construction contracting without direct property development operations.

The dependent variable in this study is Return on Assets (ROA), which serves as the primary proxy for financial performance. ROA captures operational profitability by calculating net income divided by total assets and is selected for its independence from capital structure distortions, making it particularly appropriate for comparing firms within the capital-intensive property and real estate sector (Aydoğmuş et al., 2022; Husain et al., 2025). The independent variables consist of the overall ESG score and its three disaggregated sub-components: the Environmental Score (ESGE), the Social Score (ESGS), and the Governance Score (ESGG). ESGE evaluates a firm's efforts related to environmental sustainability, such as carbon emissions management, energy efficiency, and waste reduction practices. ESGS examines social aspects, including employee welfare, workplace safety, and community engagement initiatives. ESGG assesses governance elements encompassing board structure, shareholder rights, executive remuneration transparency, and anti-corruption mechanisms (Velte, 2023).

To ensure robust analysis, the model incorporates two firm-level control variables that are widely recognized as determinants of financial performance (Zhou, 2024). Firm size (FSIZE) is measured as the natural logarithm of total assets and is included to account for scale differences across firms, as larger companies typically possess greater capacity to invest in ESG initiatives and access capital markets at more favorable terms (Broadstock et al., 2020). Financial leverage (LEV) is measured using the debt-to-equity ratio and reflects the extent to which a firm relies on external debt financing. Prior studies consistently demonstrate that high leverage exerts a negative effect on profitability in the property and real estate sector, as excessive debt burdens increase interest obligations and constrain strategic flexibility (Arhinful & Radmehr, 2023; Husain et al., 2025). Data for all variables are obtained from the Bloomberg Terminal and supplemented by annual reports published by the respective companies on the IDX official platform.

The sample is determined through purposive sampling (Husain et al., 2025) with the following selection criteria applied: first, the company must be listed on the IDX and have operated continuously throughout the full observation period from 2020 to 2024;

second, complete ESG score data for all four ESG indicators must be available on Bloomberg Terminal; and third, the company must have published audited annual financial statements for each year within the study period. While the broader IDXPROPERT index comprises approximately 85 listed companies, the availability of ESG data on the Bloomberg Terminal for Indonesian property and real estate firms remains limited relative to more mature markets. The study applies data integrity protocols, including the treatment of missing values and the exclusion of outliers, to enhance analytical reliability. It is important to acknowledge that the depth and granularity of ESG disclosures in Indonesia remain uneven and may constrain the explanatory power of certain ESG dimensions, a limitation consistent with observations from prior studies in the Southeast Asian context (Jamaludin et al., 2025; Le, 2024)

The disaggregation of ESG scores into their three constituent pillars is essential for capturing the distinct financial implications of each sustainability dimension, as relying solely on aggregate ESG scores may obscure the differential effects of environmental, social, and governance factors on firm profitability (Shobhwani & Lodha, 2024; Wijeweera et al., 2026). Prior to the regression analysis, classical assumption tests are conducted to ensure the validity and reliability of the OLS estimation. These include a normality test using the Kolmogorov-Smirnov approach, a multicollinearity test using the Variance Inflation Factor (VIF), a heteroscedasticity test using the Breusch-Pagan method, and an autocorrelation test using the Durbin-Watson statistic.

The empirical models estimated in this study are specified as follows:

$$\text{Model 1: } FPit = \alpha + \beta_1 ESGOit + \beta_2 FSit + \beta_3 LEVit + \epsilon it$$

$$\text{Model 2: } FPit = \alpha + \beta_1 ESGEit + \beta_2 FSit + \beta_3 LEVit + \epsilon it$$

$$\text{Model 3: } FPit = \alpha + \beta_1 ESGSit + \beta_2 FSit + \beta_3 LEVit + \epsilon it$$

$$\text{Model 4: } FPit = \alpha + \beta_1 ESGGit + \beta_2 FSit + \beta_3 LEVit + \epsilon it$$

Where ROA is the return on assets of firm *i* in period *t*; ESG is the overall ESG score; ESGE, ESGS, and ESGG are the environmental, social, and governance pillar scores, respectively; FSIZE is the natural logarithm of total assets; LEV is the debt-to-equity ratio; α_0 is the intercept; β_1 to β_3 are regression coefficients; and ϵit is the error term. Four separate OLS regression models are estimated, each corresponding to one ESG dimension, to enable a direct and comparative assessment of the distinct financial implications of the environmental, social, and governance pillars on firm profitability (Shobhwani & Lodha, 2024; Wijeweera et al., 2026).

Table 2 summarises the study variables and their sources. ROA (dependent variable) measures operational profitability as net income divided by total assets. The independent variables comprise the ESG Overall Score and three pillar scores — ESGE (environmental), ESGS (social), and ESGG (governance) — all sourced from Bloomberg Terminal. Firm size (natural logarithm of total assets) and financial leverage (debt-to-equity ratio) serve as control variables.

Table 2
Data and data sources of the study

Data type	Variable	Description	Source
Dependent variable	Return on Assets (ROA)	Measures operational profitability; calculated as net income divided by total assets	Bloomberg Terminal

Data type	Variable	Description	Source
Independent variables	ESG Overall Score	Composite Environmental, Social, and Governance performance score ranging from 0 to 10	Bloomberg Terminal
	Environmental Score (ESGE)	Evaluates environmental sustainability efforts such as carbon emissions, energy use, and waste management	Bloomberg Terminal
	Social Score (ESGS)	Measures social practices, including employee welfare, community engagement, and workplace safety	Bloomberg Terminal
	Governance Score (ESGG)	Assesses governance practices such as board structure, shareholder rights, and transparency	Bloomberg Terminal
Control variables	Firm Size (FSIZE)	Real value of total assets of the firms	Bloomberg Terminal / Annual Reports
	Financial Leverage (LEV)	Debt-to-equity ratio indicates the firm's reliance on borrowed funds relative to shareholders' equity.	Bloomberg Terminal / Annual Reports

Source(s): Authors' own work, 2026

RESULTS AND DISCUSSION

Descriptive Analysis

Descriptive analysis plays a key role in this study by providing fundamental insights into the relationship between ESG scores and corporate performance in Indonesia's real estate sector, using data from 87 property and real estate companies listed on the Indonesian Stock Exchange (IDX) from 2020 to 2024. This analysis provides an empirical understanding of key variables, including ESG Overall Score, Environment Score, Social Score, Governance Score, and ROA, which serve as proxies for financial performance.

The descriptive analysis in Table 3 provides foundational insights into the distribution and variability of key variables used in this study. Data were drawn from 87 publicly listed property and real estate companies on the Indonesia Stock Exchange (IDX) over the period 2020–2024, yielding a balanced panel of 435 firm-year observations. The dependent variable, Return on Assets (ROA), exhibits a mean of 0.0595 (approximately 5.95%), with a standard deviation of 0.0834, indicating moderate but heterogeneous profitability across the sample. The minimum ROA of -0.2162 reflects the financial distress experienced by certain firms during the COVID-19 pandemic in 2020–2021, while the maximum of 0.3564 captures highly efficient asset utilization by top-performing developers.

Table 3
Descriptive Statistics of Research Variables

Variable	Obs	Mean	Std. Dev	Min	Max
Dependent variable					
ROA	435	0.0595	0.0834	-0.2162	0.3564
Independent variables					

Variable	Obs	Mean	Std. Dev	Min	Max
ESGO (0-10)	435	3.178	1.426	0.080	8.560
ESGE (0-10)	435	2.623	2.026	0.000	9.070
ESGS (0-10)	435	2.632	1.782	0.000	8.330
ESGG (0-10)	435	3.823	1.981	1.400	35.56
Control variables					
Firm Size (IDR)	435	1.35E+14	2.03E+14	6.65E+11	9.19E+14
Leverage	435	1.206	10.038	-72.693	156.010

Source : Authors' own work, 2026

The ESG Overall Score (ESGO) averages 3.178 on a 0–10 Bloomberg Terminal scale, with a standard deviation of 1.426, signaling considerable dispersion in sustainability commitment across the sector. The range between the minimum (0.080) and maximum (8.560) values—an 8.48-point spread—underscores the highly uneven state of ESG adoption among Indonesian property companies. Similar patterns emerge across the individual pillars: the Environmental Score (ESGE) averages 2.623 with the largest standard deviation (2.026) among all ESG dimensions, suggesting that environmental practices remain the most inconsistent. The Social Score (ESGS) averages 2.632, while the Governance Score (ESGG) has the highest mean among individual pillars at 3.823, consistent with the relatively well-established regulatory expectations for corporate governance in Indonesia, particularly under the Financial Services Authority (OJK) framework. These figures collectively indicate that while governance serves as the most developed ESG dimension in the Indonesian property sector, environmental and social performance remain nascent and widely variable—a pattern that parallels findings in comparable emerging market contexts (Husain et al., 2025; Mubin et al., 2023).

Control variables further reflect the sectoral heterogeneity. Firm Size (FS), measured as total assets, averages approximately IDR 135 trillion, with a maximum exceeding IDR 919 trillion, indicating the presence of both large-scale national developers and significantly smaller regional players within the sample. Leverage (LVR), proxied by the debt-to-equity ratio, averages 1.206 but exhibits a median of only 0.405, indicating a right-skewed distribution driven by a small number of highly leveraged firms—some with negative equity resulting from accumulated losses, producing extreme minimum values of -72.693.

Panel Data Model Selection

Before regression estimation, this study determines the most appropriate estimation model among the Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM) through a sequential set of specification tests: the Chow Test, the Hausman Test, and the Lagrange Multiplier (LM) Test (Husain et al., 2025). Table 4 presents the consolidated results across all four models.

Table 4
Descriptive Statistics of Research Variables

Model	Chow Test (Prob.)	Decision	Hausman Test (Prob.)	Decision	LM Test (Prob.)	Decision	Selected Model
Model 1 (ESGO)	0.0008	FEM	0.4378	REM	0.0009	Random Effect Model	

Model	Chow (Prob.)	Test Decision	Hausman Test (Prob.)	Decision	LM (Prob.)	Test Decision	Selected Model
Model 2 (ESGE)	0.0005	FEM	0.6002	REM	0.0004		Random Effect Model
Model 3 (ESGS)	0.0003	FEM	0.0528	REM	0.0009		Random Effect Model
Model 4 (ESGG)	0.0000	FEM	0.5335	REM	0.0000		Random Effect Model

Source : Authors' own work, 2026

The Chow Test consistently rejects the null hypothesis of CEM in favor of FEM across all four models ($p < 0.05$), indicating the presence of significant individual heterogeneity among firms. The subsequent Hausman Test fails to reject the null hypothesis in all models, with probability values ranging from 0.0528 (Model 3) to 0.6002 (Model 2), indicating that individual effects are not systematically correlated with the independent variables, thereby satisfying the core assumptions of REM. This conclusion is further supported by the Breusch-Pagan Lagrange Multiplier Test, which yields significant cross-sectional statistics across all models ($p < 0.001$), thereby affirming the presence of individual random effects and the superiority of REM over CEM.

Classical Assumption Tests

Before interpreting the regression results, this study verifies the fulfillment of classical econometric assumptions. Table 5 summarizes the normality test results, while multicollinearity, heteroscedasticity, and autocorrelation diagnostics are discussed thereafter.

Table 5
Normality Test Results (Jarque-Bera)

Model	Jarque-Bera Stat.	Probability	Skewness	Kurtosis	Conclusion
Model 1 (ESGO)	5.882	0.0528	0.262	2.777	Normal
Model 2 (ESGE)	4.883	0.0871	0.227	2.750	Normal
Model 3 (ESGS)	4.912	0.0858	0.188	2.639	Normal
Model 4 (ESGG)	2.938	0.2302	0.144	2.719	Normal

Source : Authors' own work, 2026

All four models yield Jarque-Bera probability values exceeding the 5% significance threshold, confirming that residuals are normally distributed. Skewness values remain close to zero (0.144–0.262), and kurtosis values approximate the theoretical benchmark of 3 (2.639–2.777), further supporting normality. Multicollinearity diagnostics using centered Variance Inflation Factor (VIF) values confirm the absence of collinearity, with all centered VIF values remaining close to 1.0 across all models and variables, well below the critical threshold of 10. Heteroscedasticity tests under the Panel EGLS Cross-section Random Effects approach yield probability values far above 0.05 in every model, confirming homoscedasticity. Finally, Durbin-Watson statistics across all models range from 1.710 to 1.773, within the conventional no-autocorrelation band of 1.5 to 2.5. Collectively, the fulfillment of all classical assumptions confirms that the Random Effect Model estimations satisfy the Gauss-Markov theorem conditions for the Best Linear Unbiased Estimator (BLUE) property.

The Impact of ESG Overall Score on ROA

Table 6 presents the regression results of Model 1, which estimates the effect of the ESG Overall Score (ESGO) on financial performance (ROA), while controlling for firm size (FS) and leverage (LVR).

Table 6
Regression Result of Model 1

Variables	Label	Coefficient	Std. Error	t-Statistic	Prob.
Independent variable					
ESG Overall Score	ESGO	1.803636	0.272883	6.6096	0.0000***
Control variables					
Firm Size	FS	0.977242	0.217308	4.4970	0.0000***
Leverage	LVR	-0.960415	0.177210	-5.4197	0.0000***
Constant	C	-0.008734	0.010265	-0.8509	0.3953
R ² = 0.1673					
Adj. R ² = 0.1615					
F-stat = 28.867 (p = 0.0000)					
Durbin-Watson = 1.710					

Note(s): *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Source: Authors' own work (2026)

ROA = $-0.008734 + 1.803636 \text{ ESGO} + 0.977242 \text{ FS} - 0.960415 \text{ LVR} + \varepsilon$

The results in Table 6 reveal that the ESG Overall Score (ESGO) exerts a positive and highly significant effect on ROA, with a coefficient of 1.804 and a probability of 0.0000. This finding supports H1 and implies that Indonesian property and real estate firms with stronger aggregate ESG performance consistently generate higher asset returns. Firm Size (FS) also shows a significant positive effect ($\beta = 0.977$, $p < 0.01$), reflecting scale advantages in operational efficiency and capital access. Leverage (LVR) exhibits a significant negative effect ($\beta = -0.960$, $p < 0.01$), consistent with the financial burden imposed by debt servicing obligations. The F-statistic of 28.867 ($p = 0.000$) confirms the joint significance of the model, and the adjusted R² of 0.1615 indicates that approximately 16.15% of the variation in ROA is explained by the three predictors.

This finding is consistent with Stakeholder Theory (Freeman, 1984), which posits that firms capable of integrating the expectations of diverse stakeholders into their core strategy are better positioned to achieve superior long-term financial outcomes. Within the capital-intensive property sector, where legitimacy from local communities, regulatory bodies, and institutional investors is paramount, aggregate ESG performance serves as a credible signal of strategic sustainability, translating into operational resilience and profitability (Hu et al., 2025). The result also aligns with empirical evidence from Herman et al. (2025), who confirmed a significant positive association between ESG ratings and ROA among NASDAQ and NYSE-listed firms, and Husain et al. (2025), who documented a comparable positive ESG-ROA relationship among Malaysian-listed property companies.

Moreover, the strong positive coefficient of ESGO suggests that the integration of environmental, social, and governance practices creates greater financial benefits when implemented collectively rather than individually. Companies with stronger overall ESG performance are generally perceived as more transparent, sustainable, and capable of managing long-term business risks, which can improve investor confidence and

strengthen corporate reputation. In Indonesia's property and real estate sector, where projects are highly dependent on regulatory approval, stakeholder support, and long-term financing, comprehensive ESG implementation may help firms maintain business continuity and enhance operational effectiveness. These findings indicate that ESG is increasingly viewed not only as a sustainability commitment, but also as a strategic factor that contributes to long-term profitability and corporate competitiveness.

The Impact of Environment Score on ROA

To further examine the effect of each ESG dimension, Table 7 reports the regression results of Model 2, which tests the influence of the Environmental Score (ESGE) on financial performance (ROA), with firm size (FS) and leverage (LVR) included as control variables.

Table 7
Regression Result of Model 2

Variables	Label	Coefficient	Std. Error	t-Statistic	Prob.
Independent variable					
Environmental Score	ESGE	1.106861	0.199747	5.5413	0.0000***
Control variables					
Firm Size	FS	0.991333	0.223512	4.4353	0.0000***
Leverage	LVR	-0.176498	0.035807	-4.9292	0.0000***
Constant	C	0.019173	0.007708	2.4874	0.0132**
$R^2 = 0.1436$					
Adj. $R^2 = 0.1376$					
F-stat = 24.092 (p = 0.0000)					
Durbin-Watson = 1.728					

Note(s): *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Source : Authors' own work (2026)

ROA = 0.019173 + 1.106861 ESGE + 0.991333 FS - 0.176498 LVR + ε

Model 2 results demonstrate that the Environmental Score (ESGE) has a positive and significant effect on ROA ($\beta = 1.107$, $p = 0.0000$), supporting H2. Firm Size remains positively significant ($\beta = 0.991$, $p < 0.01$), and Leverage continues to exert a significant negative influence ($\beta = -0.176$, $p < 0.01$). The model's F-statistic (24.092, $p = 0.000$) confirms joint significance, with an adjusted R^2 of 0.1376.

This result underscores that environmental stewardship in the property sector translates into measurable financial gains. Property and real estate firms that manage environmental risks, including construction-related waste, energy intensity, carbon emissions, and land use impact, are better positioned to navigate Indonesia's increasingly stringent environmental regulatory framework, thereby avoiding costly compliance failures and project delays (Erol et al., 2023). The coefficient of ESGE (1.107), while lower than that of ESGO (1.804), confirms that environmental performance alone contributes meaningfully but that its financial impact is maximized when integrated with social and governance dimensions. This finding is consistent with Aydoğmuş et al. (2022) and Ben Amor & Kooli (2025), and with Husain et al. (2025), who found that environmental initiatives positively contribute to shareholder returns and market valuation in the Malaysian property sector.

The Impact of Social Score on ROA

Table 8 extends the analysis to the social dimension of ESG, presenting the regression results of Model 3, which examines the effect of the Social Score (ESGS) on financial performance (ROA), controlling for firm size (FS) and leverage (LVR).

Table 8
Regression Result of Model 3

Variables	Label	Coefficient	Std. Error	t-Statistic	Prob.
Independent variable					
Social Score	ESGS	1.204938	0.328489	3.6681	0.0003***
Control variables					
Firm Size	FS	0.928508	0.221216	4.1973	0.0000***
Leverage	LVR	-0.181349	0.036370	-4.9863	0.0000***
Constant	C	0.027974	0.007946	3.5205	0.0005***
R ² = 0.1105					
Adj. R ² = 0.1043					
F-stat = 17.851 (p = 0.0000)					
Durbin-Watson = 1.773					

Note(s): *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$

Source : Authors' own work (2026)

ROA = 0.027974 + 1.204938 ESGS + 0.928508 FS - 0.181349 LVR + ε

Model 3 results indicate that the Social Score (ESGS) positively and significantly affects ROA ($\beta = 1.205$, $p = 0.0003$), providing support for H3. Firm Size exerts a positive effect ($\beta = 0.929$, $p < 0.01$), while Leverage continues to negatively influence ROA ($\beta = -0.181$, $p < 0.01$). The F-statistic (17.851, $p = 0.000$) confirms the model's joint significance, and the adjusted R² stands at 0.1043.

The ESGS coefficient (1.205) exceeds that of ESGE (1.107), suggesting that social performance carries a relatively stronger direct influence on operational profitability than environmental performance in the Indonesian property context. This is consistent with the labor-intensive and community-dependent nature of property development, where workforce productivity, safety records, and community relationships have immediate implications for project timelines and operational costs (Song, 2024). This result aligns with Alareeni & Hamdan (2020) and Alhajjeah et al. (2025), who found positive associations between social performance and ROA, and is further corroborated by Husain et al. (2025).

The Impact of Governance Score on ROA

Completing the dimensional analysis, Table 9 presents the regression results of Model 4, which assesses the effect of the Governance Score (ESGG) on financial performance (ROA), controlling for firm size (FS) and leverage (LVR).

Table 9
Regression Result of Model 4

Variables	Label	Coefficient	Std. Error	t-Statistic	Prob.
Independent variable					
Governance Score	ESGG	1.072944	0.358019	2.9969	0.0029***

Variables	Label	Coefficient	Std. Error	t-Statistic	Prob.
Control variables					
Firm Size	FS	0.903812	0.238430	3.7907	0.0002***
Leverage	LVR	-0.168744	0.036562	-4.6153	0.0000***
Constant	C	0.026513	0.009603	2.7608	0.0060***
$R^2 = 0.0998$					
Adj. $R^2 = 0.0936$					
F-stat = 15.933 ($p = 0.0000$)					
Durbin-Watson = 1.747					
Note(s): *** $p < 0.01$, ** $p < 0.05$, * $p < 0.10$					
Source : Authors' own work (2026)					
ROA = 0.026513 + 1.072944 ESGG + 0.903812 FS - 0.168744 LVR + ε					

Model 4 results confirm that the Governance Score (ESGG) positively and significantly affects ROA ($\beta = 1.073$, $p = 0.0029$), supporting H4. Firm Size remains positively significant ($\beta = 0.904$, $p < 0.01$), and Leverage exerts a significant negative effect ($\beta = -0.169$, $p < 0.01$). The F-statistic (15.933, $p = 0.000$) confirms the model's overall validity.

The ESGG coefficient (1.073) is the lowest among the four ESG dimensions, consistent with the notion that governance improvements tend to yield more indirect and longer-term financial returns, operating through channels such as reduced agency costs, lower information asymmetry, and improved capital allocation efficiency (Bagh et al., 2025). Nonetheless, statistical significance at the 1% level affirms that governance quality is a robust predictor of ROA in the Indonesian property sector. This result is aligned with Al Azizah & Haron (2025) and Candio (2024), and with Husain et al. (2025), who specifically document that governance scores are strongly linked to improved market valuation among Malaysian listed property firms.

Result

Table 10 consolidates the results across all four models and reveals a highly consistent pattern. All ESG dimensions, whether measured in aggregate or disaggregated by pillar, exert a positive and statistically significant effect on ROA at the 1% significance level. The ranking of ESG impact by magnitude follows: ESGO (1.804) > ESGS (1.205) > ESGE (1.107) > ESGG (1.073), indicating that the integrated ESG approach delivers the strongest profitability impact. The superiority of ESGO over all individual pillars reflects complementarity effects: the integrated management of environmental, social, and governance practices generates synergistic benefits that exceed the sum of each dimension's individual contribution.

Firm Size consistently exhibits a positive and significant effect on ROA across all models, confirming economies of scale as a structural advantage for larger developers. Leverage consistently exerts a significant negative effect, reaffirming the financial burden of debt-intensive capital structures in the sector. While adjusted R^2 values are modest (ranging from 9.36% to 16.15%), this is expected in panel data research with a broad cross-sectional dimension, given that firm profitability is influenced by numerous idiosyncratic factors beyond the scope of any parsimonious model (Baltagi, 2021). Critically, all models satisfy the BLUE conditions, ensuring that the significance and direction of coefficients are reliable for inference. These findings collectively provide robust empirical support for Stakeholder Theory in the context of Indonesia's property sector.

Table 10
Summary of Regression Results — Random Effect Model

Variable	Model 1 (ESGO)	Model 2 (ESGE)	Model 3 (ESGS)	Model 4 (ESGG)
Constant	-0.0087 (0.3953)	0.0192** (0.0132)	0.0280*** (0.0005)	0.0265*** (0.0060)
ESG Variable	1.8036*** (0.0000)	1.1069*** (0.0000)	1.2049*** (0.0003)	1.0729*** (0.0029)
Firm Size	0.9772*** (0.0000)	0.9913*** (0.0000)	0.9285*** (0.0000)	0.9038*** (0.0002)
Leverage	-0.9604*** (0.0000)	-0.1765*** (0.0000)	-0.1813*** (0.0000)	-0.1687*** (0.0000)
R ²	0.1673	0.1436	0.1105	0.0998
Adj. R ²	0.1615	0.1376	0.1043	0.0936
F-statistic	28.867***	24.092***	17.851***	15.933***
Durbin-Watson	1.710	1.728	1.773	1.747

Note(s): *** $p < 0.01$, ** $p < 0.05$. Values in parentheses are probability values.

Source : Authors' own work (2026)

CONCLUSION AND SUGGESTION

This study aims to examine the effect of Environmental, Social, and Governance (ESG) Scores on financial performance, proxied by Return on Assets (ROA), in companies in the property and real estate sectors listed on the Indonesia Stock Exchange for the period 2020–2024. Based on the results of panel data regression analysis using the Random Effect Model (REM) on 435 observations from 87 sample companies, the following are the conclusions for each hypothesis tested in this study:

All four hypotheses were accepted. Ha1 confirmed that the ESG Overall Score (ESGO) has a positive and significant effect on ROA ($\beta = 1.804$, $p = 0.0000$), with the largest coefficient among all dimensions, affirming that integrated ESG management delivers the strongest profitability impact. Ha2 confirmed that the Environmental Score (ESGE) positively and significantly affects ROA ($\beta = 1.107$, $p = 0.0000$), reflecting the financial benefits of proactive environmental risk management. Ha3 confirmed that the Social Score (ESGS) has the second-largest effect on ROA ($\beta = 1.205$, $p = 0.0003$), underscoring the direct link between social practices and operational efficiency in the labour-intensive property sector. Ha4 confirmed that the Governance Score (ESGG) positively and significantly affects ROA ($\beta = 1.073$, $p = 0.0029$), affirming that transparent and accountable governance structures contribute to superior asset returns.

Overall, all four research hypotheses were accepted, indicating that each ESG dimension—both in aggregate and individually—has a positive and significant effect on the ROA of Indonesian property and real estate companies. The order of magnitude of the effects from largest to smallest is ESGO (1.803636), ESGS (1.204938), ESGE (1.106861), and ESGG (1.072944), indicating that a comprehensive and integrated ESG approach yields the greatest financial benefits, followed by the social, environmental, and governance dimensions individually.

From a theoretical standpoint, this study reinforces stakeholder theory by providing empirical evidence that firms engaging more actively in environmental, social, and governance practices tend to achieve stronger financial performance, indicating that value creation extends beyond shareholder-focused profit maximization to encompass broader stakeholder interests. The consistent positive and significant effect of each ESG dimension, individually and in aggregate, on ROA further supports the notion that sustainability performance functions as a strategic resource rather than merely a

compliance cost, aligning with the resource-based view which posits that ESG-related capabilities can serve as a source of competitive advantage. Additionally, the significant influence of firm size and leverage as control variables confirms that firm-level characteristics remain important determinants of financial performance and should continue to be incorporated in future ESG-performance research to avoid biased or spurious estimates.

Practically, the findings suggest that corporate managers, particularly in the property and real estate sector, should consider ESG integration not solely as a regulatory or reputational obligation but as a strategic investment capable of enhancing profitability, and should therefore prioritize the improvement of environmental, social, and governance practices simultaneously given that all three dimensions contribute positively to financial performance. For investors, the results imply that ESG scores can serve as a useful screening criterion when assessing firms with stronger long-term financial prospects, particularly in emerging markets such as Indonesia. Meanwhile, the negative relationship between leverage and ROA indicates that firms should exercise caution in their capital structure decisions, as excessive reliance on debt financing may erode profitability even when ESG performance is strong. Finally, policymakers and regulators may use these findings to strengthen incentives for ESG disclosure and adoption among listed firms, given the demonstrated link between sustainability performance and financial outcomes.

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