

THE EFFECT ESG DISCLOSURE ON FIRM VALUE: THE MEDIATING ROLE OF FINANCIAL PERFORMANCE IN MANUFACTURING COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE DURING THE 2020–2024 PERIOD

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Abstract

This study aims to examine the effect of Environmental, Social, and Governance (ESG) disclosure on firm value, with financial performance serving as a mediating variable, in manufacturing companies listed on the Indonesia Stock Exchange (IDX). Firm value is proxied by Tobin's Q, while financial performance is measured using Return on Assets (ROA). The study employs panel data from manufacturing companies during the 2020–2024 period and uses the Bloomberg ESG Disclosure Score as a proxy for ESG disclosure. Data were analyzed using panel data regression and the Sobel test with the assistance of EViews 13 software to examine the mediating effect of financial performance. The results of the main analysis indicate that ESG disclosure does not significantly affect firm value. In addition, although ESG disclosure significantly affects ROA, the direction of the relationship is contrary to the proposed hypothesis. Furthermore, ROA does not significantly affect firm value and is unable to mediate the relationship between ESG disclosure and firm value. However, the robustness test using a one-year time-lag approach reveals that ESG disclosure has a positive and significant effect on both ROA and Tobin's Q in the subsequent period. The Sobel test further confirms that ROA partially mediates the relationship between ESG disclosure and firm value under the time-lag model. These findings suggest that the benefits of ESG implementation in manufacturing companies are not immediately reflected in financial performance and firm value. Instead, the positive impact of ESG tends to emerge over time, indicating the presence of a time-lag effect. Therefore, ESG should be viewed as a long-term strategic investment capable of creating sustainable value for firms.

Keywords: ESG Disclosure, Financial Performance, Return on Assets (ROA), Firm Value, Tobin's Q, Manufacturing Companies, Time-Lag Effect.

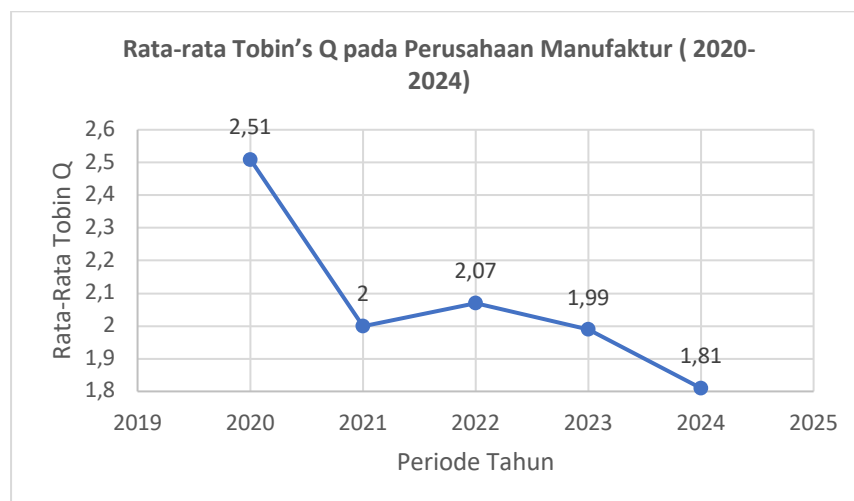
I. INTRODUCTION

Firm value is one of the most critical metrics for evaluating a company's success in generating shareholder wealth. From a financial perspective, firm value reflects investors' perceptions of a company's current performance and future growth prospects, and is typically manifested in stock prices formed through the interaction of supply and demand in capital markets. A higher firm value signals greater investor confidence in the company's ability to generate and sustain earnings over time. Brigham and Houston (2019) assert that firm value is closely tied to stock price, which encapsulates the market's comprehensive assessment of corporate performance and opportunity. As capital markets evolve, the concept of firm value has expanded beyond a reflection of financial achievements alone to encompass investor expectations regarding a company's capacity to create sustainable value.

In the context of the manufacturing sector, firm value dynamics differ markedly from other industries. Manufacturing is inherently asset-intensive, characterized by high operational costs and significant dependence on production efficiency and market demand stability. These structural characteristics make manufacturing firm values particularly sensitive to changes in economic conditions and operational performance. Xu et al. (2022) demonstrated that operational efficiency exerts a significant impact on firm value in the manufacturing sector, with companies that manage resources optimally typically commanding higher market valuations. Empirical evidence, however, reveals that manufacturing firm values are far from stable. Globally, firm values are subject to fluctuations driven by

macroeconomic conditions, input price volatility, and shifting market demand. This instability is particularly evident among Indonesian manufacturing companies listed on the Indonesia Stock Exchange (IDX).

Figure Trend of Firm Value (Tobin's Q) in Manufacturing Companies Listed on the Indonesia Stock Exchange During 2020–2024



Source: (IDX, 2026)

Data show that the average Tobin's Q of manufacturing companies listed on the IDX declined from 2.51 in 2020 to 1.81 in 2024, following a fluctuating trajectory (IDX, 2026). While a brief recovery to 2.07 was observed in 2022, the overall trend is downward, with Tobin's Q approaching unity in recent years — an indication that market valuations are converging toward book values and that firms are increasingly failing to generate market premiums. This trend reflects the combined impact of the COVID-19 pandemic, rising production costs, and weakened market demand, and highlights the challenge facing Indonesian manufacturing companies in sustaining investor confidence.

Against this backdrop, ESG (Environmental, Social, and Governance) disclosure has emerged as an increasingly significant non-financial factor shaping investor decision-making. Globally, ESG frameworks such as those of the Global Reporting Initiative (GRI), the Sustainability Accounting Standards Board (SASB), and the IFRS Sustainability Disclosure Standards have become widely adopted benchmarks for corporate sustainability reporting. In Indonesia, the Financial Services Authority (OJK) has reinforced this trend through POJK No. 51/POJK.03/2017, which mandates sustainable finance reporting for publicly listed entities. Quantitative ESG disclosure scores — such as those provided by Bloomberg — have been widely adopted in empirical research to measure the depth and quality of corporate sustainability reporting.

The theoretical rationale for a positive ESG–firm value relationship draws on multiple frameworks. Signaling theory (Spence, 1973) suggests that ESG disclosure reduces information asymmetry by conveying positive signals about management quality and long-term risk management to investors. Legitimacy theory (Suchman, 1995) posits that firms engaging in ESG activities obtain broader social acceptance, which in turn reinforces investor confidence. Stakeholder theory (Freeman, 1984) emphasizes that ESG engagement strengthens relationships with key stakeholders, ultimately contributing to operational efficiency and value creation.

Despite these theoretical expectations, empirical evidence on the ESG–firm value relationship remains mixed and context-dependent. Several studies have found positive associations (Gillan et al., 2021; Broadstock et al., 2021), while others document neutral or negative effects, particularly in the short run (Kumar et al., 2023; Velte, 2024; Nampoothiri et al., 2024). A critical but underexplored dimension is the temporal lag between ESG implementation and its measurable financial outcomes, which may explain much of the observed inconsistency in the literature. Prior research has also proposed financial performance as a potential mediating mechanism in the ESG–firm value relationship. The argument is that ESG activities first enhance profitability — through efficiency gains, reputational benefits, and reduced financing costs — and that improved profitability subsequently drives higher market valuations. However, empirical evidence supporting this full mediation pathway remains limited, particularly in

emerging markets such as Indonesia. This study addresses these gaps by examining the effect of ESG disclosure on firm value, with ROA as a mediating variable, among Indonesian manufacturing companies over 2020–2024. The study makes three contributions to the literature. First, it provides contextual evidence from Indonesia, an emerging market with a developing ESG reporting landscape. Second, it explicitly tests the mediation hypothesis using both main-period and time-lag specifications, enabling comparison of contemporaneous and lagged ESG effects. Third, it contributes empirical evidence to the growing debate on the temporal dynamics of ESG value creation, offering practical implications for firms, investors, and regulators.

II. LITERATURE REVIEW

a. Theoretical Foundations

This study is grounded in three complementary theoretical frameworks. Signaling theory (Spence, 1973) provides the primary lens, positing that ESG disclosure serves as a credible signal to external parties — particularly investors — regarding the quality of corporate governance and the firm's capacity for long-term risk management. Transparency in ESG reporting reduces information asymmetry and may increase investor confidence, thereby supporting higher market valuations. Legitimacy theory (Suchman, 1995) complements this by explaining that firms engage in ESG activities to obtain and maintain social legitimacy, which in turn reinforces stakeholder trust and contributes to firm value creation. Stakeholder theory (Freeman, 1984) further argues that firms managing relationships with a broad range of stakeholders through responsible ESG practices are more likely to achieve sustainable competitive advantage, improved financial performance, and, ultimately, higher firm value.

b. Firm Value

Firm value represents investors' collective assessment of a company's current performance and future prospects. In empirical finance research, firm value is commonly proxied by Tobin's Q — the ratio of a firm's market value (equity plus debt) to the replacement value of its total assets (Chung & Pruitt, 1994). A Tobin's Q exceeding unity implies that the market values the firm above its book assets, reflecting positive growth expectations. In the context of modern capital markets, firm value is no longer determined solely by financial performance but is increasingly influenced by non-financial factors, including corporate governance quality and sustainability practices (Tandelilin, 2017). This study employs Tobin's Q as the proxy for firm value, consistent with the majority of recent empirical studies in this field.

c. ESG Disclosure

Environmental, Social, and Governance (ESG) disclosure refers to corporate reporting on three dimensions of sustainable business practice. The environmental dimension covers a firm's management of natural resource use, carbon emissions, waste, and energy efficiency. The social dimension addresses employee welfare, human rights, community engagement, and supply chain responsibility. The governance dimension encompasses board composition, executive accountability, internal controls, and transparency. ESG information is increasingly used by institutional investors as a supplementary input to conventional financial analysis, reflecting growing recognition that non-financial risks — including regulatory, reputational, and environmental risks — can materially affect long-term corporate performance (Gillan, Koch & Starks, 2021).

In this study, ESG disclosure is measured using the Bloomberg ESG Disclosure Score, a widely adopted continuous index ranging from 0 to 100, where higher scores reflect greater transparency and comprehensiveness in sustainability reporting. The Bloomberg score is selected for its objectivity, international standardization, and extensive use in peer-reviewed empirical research (Fatemi, Glaum & Kaiser, 2018; Broadstock et al., 2021).

d. Financial Performance

Financial performance reflects a firm's ability to generate earnings from its available resources. In this study, financial performance is proxied by Return on Assets (ROA), calculated as net income divided by total assets. ROA is particularly appropriate for manufacturing firms, which are heavily asset-intensive, as it directly captures the efficiency with which management deploys physical and financial assets to generate profit (Brigham & Houston, 2019). Consistent with signaling theory, a higher ROA signals operational excellence to the market, which is expected to translate into higher firm valuations. ROA has been widely employed in ESG–performance–value research as a measure of profitability due to its ability to capture firm-wide operational efficiency (Fama & French, 2015; Nuryaman, 2015).

e. Control Variables

Three control variables are included to isolate the effects of the main variables of interest. Firm size (measured as the natural logarithm of total assets) is controlled because larger firms tend to have greater financial capacity,

more developed ESG infrastructure, and better access to capital markets, all of which independently influence financial performance and firm value (Raimo et al., 2021; Albitar et al., 2022). Leverage (measured by the Debt-to-Equity Ratio, DER) is controlled because capital structure affects both profitability and market valuation; highly leveraged firms bear greater financial risk, which may depress both ROA and Tobin's Q (Ahmad et al., 2021; Brogi & Lagasio, 2022). Sales growth is controlled because firms with higher growth rates are associated with stronger investor expectations and greater capacity to fund ESG activities (Gillan et al., 2021; Friede et al., 2021).

- **Firm Size**

Firm size refers to the scale of a company, which is generally measured using total assets. Companies with a larger scale tend to have more adequate capital, broader access to financing, stronger operational capabilities, and a higher level of investor confidence compared to smaller companies. In addition, larger companies also have a higher level of public exposure, which motivates them to implement ESG practices and carry out more comprehensive sustainability disclosures. In the context of ESG and firm value research, firm size is frequently used as a control variable because the scale of a company can influence both financial performance and firm value. Large companies are generally better positioned to allocate assets toward sustainability activities and are more capable of obtaining legitimacy from stakeholders. Research by Raimo et al. (2021) explains that firm size has a positive impact on ESG implementation and firm value enhancement, as larger companies possess stronger operational and financial capabilities. Furthermore, research by Albitar et al. (2022) reveals that companies of a larger scale generally have better ESG disclosure quality compared to smaller companies. Therefore, firm size is used as a control variable in this study to control for the influence of company scale on the relationship between ESG, financial performance, and firm value.

- **Leverage**

Leverage is a ratio that indicates the extent to which a company uses debt to finance its operational activities and investments. A high level of leverage reflects the magnitude of the company's obligations to external parties, thereby increasing the company's financial risk. The higher the company's leverage, the greater the interest burden and debt repayment obligations that the company must fulfill. In ESG and firm value research, leverage is frequently used as a control variable because a company's capital structure can influence both financial performance and investors' perceptions of the company. Companies with high leverage levels typically face greater financial pressure, which can affect the company's ability to optimally carry out ESG activities. In addition, leverage can also affect the company's profitability due to the increase in the company's financial burden.

- **Growth**

Growth refers to a company's growth rate, which reflects the company's competence in improving its operational performance over time. Company growth is generally measured using sales growth or asset growth. Companies with a high level of growth typically have large business expansion opportunities, maximum profit prospects, and the potential for increased firm value in the future. In the context of ESG and firm value research, growth serves as a control variable because company growth can influence investors' perceptions of the company's prospects. Companies with high growth rates tend to be regarded as having better competence in creating long-term value and maintaining business sustainability. In addition, they also have greater competence in supporting ESG implementation.

III. Conceptual Framework

The conceptual framework in this study is constructed to illustrate the relationships among the variables under investigation, namely ESG disclosure as the independent variable, firm value as the dependent variable, and financial performance as the mediating variable. This framework is grounded in theoretical foundations and prior empirical research that explain how sustainability information may influence corporate performance and, ultimately, firm value.

Based on Signaling Theory, ESG disclosure can serve as a positive signal to investors regarding the quality of management and a firm's capacity to manage long-term risks. Sound ESG implementation may also enhance operational efficiency and asset utilization, which in turn improves financial performance as measured by Return on Assets (ROA). Strong financial performance then reinforces investor confidence in the company's future prospects, driving increases in stock valuation and firm value. Accordingly, the relationship between ESG disclosure and firm value operates not only directly, but also indirectly through financial performance as a mediating variable

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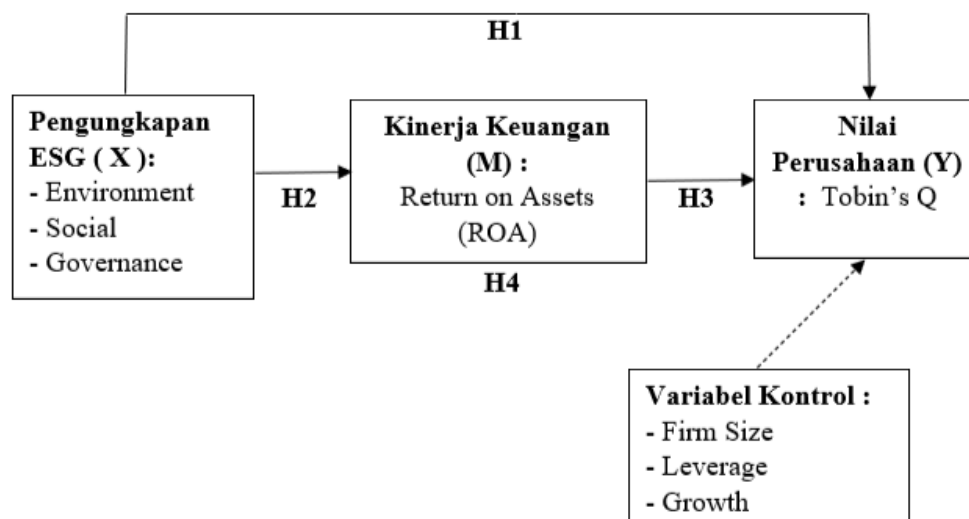


Figure of Conceptual Research Framework
Source: Author, 2026

Notes:

- X = Independent Variable
- M = Mediating Variable
- Y = Dependent Variable
- H₁, H₂, H₃, H₄ = Research Hypotheses
- Control Variables = Firm Size, Leverage, and Growth

Based on the Conceptual Framework Figure, it is identified that the independent variable is Environmental, Social, and Governance (ESG) disclosure, the dependent variable is firm value, the mediating variable is financial performance, and the control variables consist of firm size, leverage, and growth. This study aims to analyze whether ESG disclosure affects firm value directly or indirectly through financial performance in manufacturing companies listed on the Indonesia Stock Exchange (IDX) over the period 2020–2024. Drawing on Signaling Theory and supported by prior empirical research, four research hypotheses are formulated.

Table 1. Operational Definition of Variables

Variable Name	Variable Definition	Parameter	Measurement Scale
Firm Value (Y)	Firm value reflects investors' perceptions of the company's performance and future prospects as reflected in its stock price in the market.	Tobin's Q = (MVE + DEBT) / TA Where: MVE = Closing stock price × number of outstanding shares; DEBT = Total liabilities; TA = Total assets	Ratio
ESG Disclosure (X)	The level of corporate transparency in disclosing Environmental, Social, and Governance (ESG) information based on international standards	ESG Disclosure Score = Bloomberg ESG score (0–100)	Ratio
Financial Performance (M)	The company's ability to generate profits by utilizing its total assets effectively and efficiently.	ROA = (Net Income / Total Assets) × 100%	Ratio

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Variable Name	Variable Definition	Parameter	Measurement Scale
Firm Size (SIZE)	The size of the company based on its total assets.	$SIZE = \ln(\text{Total Assets})$	Ratio
Leverage (DER)	The level of debt utilization in the company's capital structure.	$DER = \text{Total Debt} / \text{Total Equity}$	Ratio
Sales Growth (SG)	The company's ability to increase sales from the previous period to the current period.	$SG = (\text{Sales}_t - \text{Sales}_{t-1}) / \text{Sales}_{t-1}$	Ratio

Using the purposive sampling method, manufacturing companies that did not have Bloomberg ESG data consecutively throughout the research period were excluded from the research sample. After the selection process, a total of 18 companies met the research criteria for the 2020–2024 period. With a research period of five years, the total number of research observations was 90.

Table 2. Research Sample Selection Criteria

No	Sample Criteria	Number
1	Manufacturing sector companies listed on the Indonesia Stock Exchange during the 2020–2024 period	±220
2	Companies that did not have a comprehensive Bloomberg ESG Disclosure Score throughout the research period	-201
3	Companies that did not have complete information regarding the research variables	-1
4	Total research sample	18
5	Total research observations (18 × 5 years)	90

Source: Processed data, Author (2026)

Data management and analysis in this study were conducted using **EViews (Econometric Views)** software. This software was selected because it has strong capabilities in processing panel data and provides various econometric analysis features, such as classical assumption tests and mediation regression. In addition, Microsoft Excel was used as a supporting tool for data tabulation, calculation of the ESG disclosure index, and preliminary processing of financial ratios before the data were further analyzed using EViews.

IV. RESULTS AND DISCUSSION

A. Descriptive Statistics

This study employed secondary panel data from 18 manufacturing companies listed on the Indonesia Stock Exchange (IDX) over the period 2020–2024, yielding a total of 90 balanced observations.

Table 3. presents the descriptive statistics for all variables included in the analysis.

Variable	Mean	Median	Maximum	Minimum	Std. Dev.	Obs.
ESG Score	49.324	53.235	66.710	21.720	11.697	90
ROA	0.067	0.062	0.349	-0.203	0.072	90
Tobin's Q	2.076	1.224	14.415	0.572	2.273	90
Firm Size	29.729	30.715	32.938	22.002	2.834	90
DER	1.201	0.728	6.769	0.170	1.514	90
Growth	0.040	0.047	0.611	-0.363	0.140	90

Source: EViews 13 output (2026)

The mean ESG disclosure score was 49.324, with a standard deviation of 11.697, indicating moderate variability in sustainability reporting quality across the sample. The highest ESG score was 66.71 (PT Chandra Asri Pacific Tbk., 2024), while the lowest was 21.72 (PT Tempo Scan Pacific Tbk., 2020), reflecting heterogeneity in

firms' commitment to transparent ESG reporting. The mean ROA was 6.7%, suggesting that sample firms were generally profitable, although considerable variation existed (ranging from –20.3% to 34.9%). Tobin's Q had a mean of 2.076, exceeding unity, which indicates that, on average, market valuations exceeded book values. However, the large standard deviation (2.273) relative to the mean reflects significant dispersion in firm value across the sample.

a) Panel Data Model Selection

Prior to hypothesis testing, appropriate panel data regression models were selected through the Chow Test and Hausman Test for both Model I (ROA as dependent variable) and Model II (Tobin's Q as dependent variable). The Chow Test results for both models yielded a Cross-section F probability of 0.0000 (< 0.05), indicating that the Fixed Effect Model (FEM) was superior to the Common Effect Model (CEM). Subsequently, the Hausman Test for Model I produced a Chi-square statistic probability of 0.0281 (< 0.05), and for Model II, 0.0010 (< 0.05), both confirming the preference for the Fixed Effect Model over the Random Effect Model. Accordingly, the Fixed Effect Model was adopted for all hypothesis testing in this study.

b) Classical Assumption Tests

As this study employs panel data with the Fixed Effect Model, the conventional OLS assumption tests are not strictly required, in line with Baltagi (2021) and Ajija et al. (2011). Given the total number of observations of 90, normality testing was not conducted. Autocorrelation was assessed using the Durbin-Watson (DW) statistic. Model I yielded a DW value of 2.438, and Model II produced 1.494, both within acceptable ranges indicating the absence of serial autocorrelation. Multicollinearity was assessed using the correlation matrix. All inter-variable correlation values in both models were below 0.80 (the highest being 0.210 between ROA and Firm Size in Model II), confirming the absence of multicollinearity.

B. Hypothesis Testing Results

Table 4 and Table 5 present the Fixed Effect Model regression results for Model I (ROA) and Model II (Tobin's Q), respectively.

Table 4. Fixed Effect Model Regression Results – Model I (Dependent Variable: ROA)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-23.851	0.8790	-27.136	0.0084
ESG	-0.0020	0.0006	-30.971	0.0028
Firm Size	0.0866	0.0301	28.725	0.0054
DER	-0.0209	0.0059	-35.143	0.0008
Growth	0.0466	0.0231	20.199	0.0473
R-squared	0.8815	Adj. R²	0.8449	
F-statistic	24.083	Prob(F)	0.0000	

Source: EViews 13 output (2026)

Table 5. Fixed Effect Model Regression Results – Model II (Dependent Variable: Tobin's Q)

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-607.503	277.695	-21.877	0.0322
ESG	-0.0131	0.0206	-0.6364	0.5267 (ns)
ROA	69.716	36.393	19.157	0.0597 (ns)
Firm Size	21.448	0.9578	22.394	0.0285
DER	-0.5791	0.1939	-29.869	0.0039
Growth	-15.688	0.7128	-22.008	0.0312
R-squared	0.8955	Adj. R²	0.8612	
F-statistic	26.096	Prob(F)	0.0000	

Source: EViews 13 output (2026)

a) ESG Disclosure and Firm Value (H1)

The regression results in Table 5 show that ESG disclosure yields a coefficient of -0.0131 with a probability value of 0.5267 , which exceeds the 5% significance threshold. Accordingly, H1, which proposed a negative relationship between ESG disclosure and firm value, is rejected. The finding indicates that ESG disclosure scores do not exert a statistically significant influence on Tobin's Q during the 2020–2024 period.

This result is consistent with the institutional context of Indonesia, where ESG-based investment frameworks are still developing. Although signaling theory predicts that ESG disclosure should convey positive signals to investors and reduce information asymmetry, investors in the Indonesian capital market appear to prioritize short-term financial indicators such as profitability and revenue growth over sustainability metrics. This interpretation aligns with Velte (2024), who found that ESG disclosure does not always elicit a positive market response, particularly when investors remain uncertain about the economic value of ESG activities. Similarly, Nampoothiri et al. (2024) found that mandatory sustainability disclosure in European companies did not lead to significant improvements in firm value in the short run, attributing this to additional compliance costs that offset potential benefits.

The heterogeneity in ESG reporting quality across Indonesian manufacturing firms also weakens the signaling function of ESG scores. For instance, PT Charoen Pokphand Indonesia Tbk. (CPIN) registered an increase in ESG score from 51.24 in 2020 to 53.85 in 2024, yet its Tobin's Q declined from 3.685 to 2.116 during the same period. This pattern suggests that the market has not yet fully incorporated ESG information into equity valuations, and that benefits of ESG implementation are more likely to manifest over a longer time horizon.

b) ESG Disclosure and Financial Performance (H2)

The fixed effect estimation in Table 4 reveals that ESG disclosure has a coefficient of -0.0020 with a probability value of 0.0028 , which is statistically significant at the 1% level. However, the direction of the effect is negative, which contradicts H2 (which predicted a positive relationship between ESG disclosure and ROA). Consequently, H2 is rejected.

The negative relationship between ESG disclosure and ROA suggests that, in the short run, the implementation of ESG activities imposes additional costs that reduce profitability. These costs include environmental management expenditures, human resource development programs, sustainability audits, and corporate governance enhancements. Such investments increase the firm's operational burden without generating immediate financial returns, thereby depressing ROA. This is consistent with the view of Kumar et al. (2023), who found that ESG disclosure can have a negative short-term effect on profitability due to heightened operational costs, particularly in industries with high asset intensity such as manufacturing.

Empirical evidence from the sample corroborates this interpretation. PT Indocement Tungal Prakarsa Tbk. (INTP) experienced an increase in ESG score from 59.31 in 2020 to 65.65 in 2024, yet its ROA remained stagnant without significant improvement. This trajectory reflects the cost-intensive nature of ESG adoption in capital-heavy manufacturing firms. The finding is also consistent with stakeholder theory, which acknowledges that the economic benefits of ESG engagement are primarily long-term in nature and may not be immediately captured in current-period profitability metrics.

c) Financial Performance and Firm Value (H3)

Table 3 indicates that ROA has a coefficient of 69.716 with a probability value of 0.0597 , which marginally exceeds the 5% significance level (though significant at the 10% level). H3, which posited that financial performance positively affects firm value, is rejected at the conventional 5% significance threshold.

Although the sign of the coefficient is positive, its statistical insignificance suggests that ROA alone does not constitute a sufficient driver of market valuations in this sample. This finding implies that capital market participants in Indonesia incorporate a wider range of factors in their equity assessments beyond profitability, including macroeconomic conditions, industry-specific risks, dividend policy, and market sentiment. Consistent with signaling theory, while higher profitability should theoretically transmit a positive signal to investors, the results suggest that such a signal was insufficiently strong to produce a statistically meaningful impact on Tobin's Q during the 2020–2024 observation window. This may be partly attributable to the elevated macroeconomic uncertainty during the COVID-19 pandemic and recovery phases, which could have disrupted the typical profitability–valuation nexus.

d) Mediating Role of Financial Performance (H4)

The Sobel Test was employed to evaluate the significance of the indirect effect of ESG disclosure on firm value through ROA. Using the path coefficients from Models I and II, the Sobel Test statistic was calculated at

–1.629 with a p-value of 0.1032. Since this exceeds the 5% significance threshold, H4, which proposed that financial performance mediates the ESG–firm value relationship, is rejected.

The absence of a significant mediation effect is primarily attributable to two compounding conditions: (1) ESG disclosure significantly reduced ROA (negative effect), and (2) ROA did not exert a significant positive effect on Tobin's Q. Consequently, the indirect pathway ESG → ROA → Tobin's Q is rendered statistically inoperable. These results provide empirical evidence that, within the 2020–2024 period, profitability does not serve as an effective mechanism transmitting the value implications of ESG disclosure to market participants. From a theoretical perspective, stakeholder theory suggests that ESG engagement should create economic value through stronger stakeholder relationships. However, in the context of this study, such benefits have not yet been translated into measurable improvements in profitability that are subsequently appreciated by the market.

Table 6. Summary of Hypothesis Testing Results

H	Hypothesis	Coefficient	Prob.	Decision
H1	ESG disclosure negatively affects firm value (Tobin's Q)	-0.0131	0.5267	Rejected
H2	ESG disclosure positively affects financial performance (ROA)	-0.0020	0.0028	Rejected
H3	Financial performance (ROA) positively affects firm value (Tobin's Q)	69.716	0.0597	Rejected
H4	Financial performance mediates ESG disclosure → firm value	-	0.1032 (Sobel)	Rejected

Source: EViews 13 output (2026)

e) Robustness Test: One-Year Time-Lag Approach

Given that ESG benefits may require time to manifest in financial performance and market valuation, a robustness test was conducted using a one-year time-lag specification. ESG scores from 2020–2024 were regressed against ROA and Tobin's Q from 2021–2025. Table 5 presents a summary of the time-lag robustness results.

Table 7. Summary of Robustness Test Results (Time-Lag Approach, t+1)

Criterion	Model 1: ROA (t+1)	Model 2: Tobin's Q (t+1)
Estimation Method	FEM	REM
Prob(F-statistic)	0.0029	0.0000
ESG Effect	Positive Significant ($\beta = 0.0042$; $p = 0.0006$)	Positive Significant ($\beta = 0.0348$; $p = 0.0330$)
ROA Effect	—	Positive Significant ($\beta = 15.980$; $p = 0.0000$)
Sobel Test (Mediation)	—	$Z = 3.273$; $p = 0.0011$ (Significant)
Adjusted R ²	25.80%	52.57%

Source: EViews 13 output (2026)

The time-lag robustness test yields markedly different results compared to the main analysis. ESG disclosure exerts a positive and significant effect on ROA in the following year ($\beta = 0.0042$; $p = 0.0006$), suggesting that investments in ESG activities generate tangible improvements in operational efficiency and profitability over time. Furthermore, ESG disclosure also demonstrates a positive and significant effect on Tobin's Q in the subsequent period ($\beta = 0.0348$; $p = 0.0330$), indicating that capital markets begin to reward ESG-committed firms once the benefits become visible in financial performance. The Sobel Test for the time-lag model yields a statistic of 3.273 with a p-value of 0.0011, confirming that ROA acts as a partial mediator (Baron & Kenny, 1986) in the relationship between ESG disclosure and firm value under the lagged specification. The direct effect of ESG on Tobin's Q remains

significant ($p = 0.0330$), and the indirect path through ROA is also significant, constituting partial mediation. These findings are consistent with Rojo-Suárez and Alonso-Conde (2023), who noted limited short-term ESG effects, and Friske et al. (2022), who demonstrated that the market's appreciation of sustainability reporting strengthens over time.

Observable patterns in individual firms further corroborate the time-lag dynamic. PT Kalbe Farma Tbk. (KLBF) experienced an increase in ESG score from 51.78 in 2020 to 62.94 in 2024, accompanied by sustained high profitability and relatively strong firm value. Similarly, PT Tempo Scan Pacific Tbk. (TSPC) saw its ESG score rise from 21.72 to 30.76 over the same period, alongside an increase in ROA from 9.2% to 12.4% and Tobin's Q from 0.992 to 1.170. These trajectories suggest that consistent ESG improvements are gradually translated into improved financial performance, which is subsequently recognized by market participants. Collectively, the robustness test results support the presence of a time-lag effect in ESG–performance–value relationships within Indonesian manufacturing firms.

V. CONCLUSION

This study investigated the effect of ESG disclosure on firm value, with financial performance serving as a mediating variable, among manufacturing companies listed on the Indonesia Stock Exchange (IDX) during the period 2020–2024. Using panel data regression with the Fixed Effect Model and the Sobel Test, the main analysis yielded four key findings. First, ESG disclosure does not significantly affect firm value as proxied by Tobin's Q ($\beta = -0.0131$; $p = 0.5267$). This indicates that, in the short run, the Indonesian capital market has not yet fully incorporated ESG information into equity valuations. Investors appear to remain primarily focused on conventional financial indicators, and the heterogeneity in ESG reporting quality across firms limits the signaling effectiveness of disclosure scores.

Second, ESG disclosure exerts a statistically significant but negative effect on financial performance as measured by ROA ($\beta = -0.0020$; $p = 0.0028$). This finding reflects the short-term cost burden of ESG implementation encompassing environmental management, social programs, governance improvements, and sustainability audits which compresses profitability in the period of adoption. Third, financial performance (ROA) does not exert a statistically significant positive effect on firm value ($\beta = 6.9716$; $p = 0.0597$ at the 5% level), indicating that profitability is not the sole determinant of market valuation during the observation period. Macroeconomic uncertainties, sector-specific risks, and broader investor sentiment appear to dilute the profitability–valuation relationship.

Fourth, consistent with the above findings, ROA does not significantly mediate the ESG–firm value relationship. The Sobel Test statistic of -1.629 ($p = 0.1032$) confirms the absence of a significant indirect effect, as both constituent paths (ESG $\rightarrow$ ROA and ROA $\rightarrow$ Tobin's Q) are either statistically insignificant or directionally unfavorable. Critically, however, the robustness test using a one-year time-lag approach reveals that ESG disclosure positively and significantly affects both ROA ($\beta = 0.0042$; $p = 0.0006$) and Tobin's Q ($\beta = 0.0348$; $p = 0.0330$) in the subsequent period. Moreover, the Sobel Test for the lagged model confirms partial mediation by ROA ($Z = 3.273$; $p = 0.0011$). These results establish the presence of a time-lag effect and demonstrate that the economic benefits of ESG implementation are not contemporaneous but materialize over time. The theoretical contribution of this study lies in reconciling conflicting prior evidence by introducing the temporal dimension as a moderating factor in the ESG–performance–value nexus. The findings suggest that signaling theory, while conceptually valid, operates with a delay in emerging markets like Indonesia, where investor ESG literacy and institutional frameworks for sustainability reporting are still evolving.

From a practical standpoint, the results carry important implications for three key stakeholder groups. For firms, ESG should be treated as a long-term strategic investment rather than a short-term compliance mechanism. Management must ensure that ESG programs are designed to generate operational efficiencies and reputation capital that yield sustained economic value. For investors, short-term ESG scores may not immediately reflect on share prices; however, consistent ESG commitment serves as a meaningful predictor of future financial performance and firm value. Investors with a medium-to-long-term horizon should therefore integrate ESG disclosure quality into their fundamental analysis. For regulators, particularly the Financial Services Authority (OJK) of Indonesia, these findings underscore the importance of standardizing and improving the quality of ESG reporting requirements—such as those articulated in POJK No. 51/POJK.03/2017—to strengthen the signaling function of sustainability disclosures.

Several limitations of this study should be noted. The sample is restricted to 18 manufacturing companies over five years, which may limit generalizability. Only aggregate ESG scores are employed, precluding analysis of the individual contributions of Environmental, Social, and Governance dimensions. Future research should consider longer observation windows, disaggregated ESG components, and alternative proxies for firm value (e.g., PBV, PER) and financial performance (e.g., ROE, NPM) to provide a more comprehensive understanding of the ESG–value relationship in the Indonesian market.

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