

Leverage, Firm Size and Gross Domestic Product as Drivers Of ESG Disclosure

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Abstract

Corporate commitment to sustainability is now widely gauged through Environmental, Social, and Governance (ESG) performance, yet disclosure practice among Indonesian firms remains far from uniform. This paper traces how far leverage, firm size, and Gross Domestic Product (GDP) shape the extent of ESG disclosure among manufacturing issuers on the Indonesia Stock Exchange across 2021-2024, drawing on a quantitative design built from secondary data in annual and sustainability reports. Eighty-four observation points were drawn through purposive sampling and processed with panel data regression under the Random Effect Model (REM). Neither firm size nor leverage was found to move ESG disclosure in any statistically meaningful way, in contrast to GDP, which registered a positive and significant effect; tested jointly, the three variables still leave a discernible mark on ESG disclosure. The findings indicate that only Gross Domestic Product (GDP) has a positive and statistically significant effect on ESG disclosure, whereas leverage and firm size do not have a statistically significant effect.

Keywords: ESG disclosure, leverage, firm size, GDP, sustainability.

Introduction

Mounting demands for sustainable development have pushed Environmental, Social, and Governance (ESG) into the center of contemporary business practice. Firms can no longer rest on economic profit alone; responsibility toward the environment, social conditions, and sound governance now comes bundled with that mandate. Through the transparency and accountability it fosters, ESG implementation is widely believed to lift corporate value over the long run, earning it a place high on the list of considerations for investors, regulators, and other stakeholders. ESG disclosure also chips away at the information asymmetry separating firms from their stakeholders by supplying fuller non-financial data. Beyond signaling corporate responsibility, ESG adoption tends to bolster reputation and deepen stakeholder trust, an asset central to building lasting relationships, much as a favorable image tends to breed consumer loyalty (Saputra et al., 2025).

Figures from the world's 250 largest firms (G250) swung considerably: 78% carried ESG information in 2017, slipping to 76% in 2020, dropping further to 68% in 2022, then climbing sharply to 82% in 2024; the broader group of 5,800 large firms across 58 countries (N100) held steadier, inching from 60% in 2017 to 62% in 2024 (International, 2024). That climb points to a stronger pull toward integrating sustainability into corporate reporting, while the 2022 dip likely traces back to shifting reporting standards or turbulence in the global economy. The sharp 2024 rebound, in turn, reflects intensifying pressure from regulators, investors, and stakeholders demanding more transparent sustainability information. One thread runs through all of it: even as the global trajectory of ESG disclosure turns more favorable, the spread across individual firms stays wide. Internal traits such as leverage and firm size, layered with macroeconomic conditions captured through Gross Domestic Product (GDP), are thought to help explain that spread, leaving room for further empirical testing.

Figure 1. ESG

Source:
2024)

That global
bypassed
attention to ESG
has grown in
Services
Regulation No.
gives the

Companies including information on ESG and sustainability in annual reports in G250 and N100s

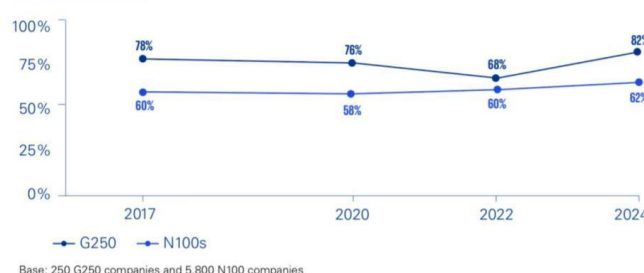


Chart
(International,

momentum has not
Indonesia, where
implementation
step. Financial
Authority
51/POJK.03/2017
government's push

some teeth, requiring firms to prepare sustainability reports as part of sustainable finance practice, yet the breadth of ESG disclosure among Indonesian firms still varies considerably, a sign that both firm characteristics and economic conditions leave their mark on how it plays out.

This study zeroes in on the manufacturing sector, given its dual role as a mainstay of the national economy and a heavy contributor to environmental strain through energy use, carbon emissions, industrial waste, and natural resource consumption. That dual weight is precisely what subjects manufacturing firms to sharper pressure from regulators, investors, and stakeholders to widen the transparency of their ESG disclosures.

A mix of internal and external forces shapes how much ESG information a firm discloses. Leverage and firm size sit on the internal side, while Gross Domestic Product (GDP) stands in as the external proxy. Mapping these factors matters, giving firms, investors, and regulators a foothold for advancing sustainable finance.

The determinants of ESG disclosure are hardly an untouched subject, research has piled up, yet the conclusions still pull in different directions (empirical gap). Manuputty et al. (2025) recorded a positive effect of leverage on ESG disclosure, while Rais and Adriansyah (2026) landed on the opposite sign. A separate contextual and variable gap surfaces too: most prior work treats ESG as a lever influencing firm performance or value rather than as the outcome being explained. (Safitri et al., 2025b), for example, traced the effect of ESG performance on firm value and urged future studies to broaden the variables, sectors, and scope under examination.

That gap is the starting point for this study, which sets out to examine how leverage, firm size, and Gross Domestic Product (GDP) shape ESG disclosure among manufacturing firms on the Indonesia Stock Exchange across 2021-2024. Where Rahman and Alsayegh (2021) traced ESG disclosure determinants among cross-country Asian firms using economic performance, profitability, leverage, and firm size for 2005-2017, this study narrows the lens to Indonesian manufacturing firms in the post-COVID-19 window of 2021-2024, adding GDP as a fresh macroeconomic factor in the explanation.

Literature Review

Signaling theory treats a corporation's public data releases as a signaling channel that narrows the information gap routinely separating management from investors, a gap that arises simply because management holds fuller information than outsiders ever can. Periodic reports become the primary yardstick investors reach for when sizing up a firm's performance and outlook. Within the ESG space, sustainability disclosure works the same way: it functions as a positive signal reflecting the quality of a firm's performance and its capacity to manage risk. Markets tend to read extensive publicity around ESG initiatives as a marker of sustainable long-term growth potential, and that reading typically shows up as firmer investor confidence and a higher firm valuation (Safitri et al., 2025a).

At its core, ESG is an attempt to fold environmental and social responsibility into a firm's internal governance as part of its everyday operations, serving as a marker of both sustainability and accountability toward stakeholders. This study leans on the ESG Score as its primary measurement tool, since it captures the intensity of disclosure and the depth of sustainable practice with greater precision. By trimming risk profiles while sharpening operational effectiveness and investor loyalty, ESG's role can lift firm value considerably; reaching further than reputation alone, adopting ESG principles works as a catalyst for firm value through solid risk governance and stronger trust-based ties with stakeholders (Safitri et al., 2025a). Compliance with, and disclosure of, the environmental, social, and governance pillars has likewise been shown empirically to send positive signals that register directly in market perception and firm capitalization among global investors (Mahmood et al., 2025).

Putting ESG principles into daily operations is tangible proof of a corporation's commitment to curbing environmental harm, lifting social welfare, and keeping governance transparent. Take manufacturing firms that proactively pursue energy efficiency or emissions cuts: the move satisfies regulatory compliance, sure, but it also trims operating costs along the way. (Safitri et al., 2025a) go further, framing this non-financial commitment as a signal of operational excellence. Long-term value (long-term value creation) tends to follow once sustainability strategy genuinely fuses with the core

business framework, strengthening competitiveness and resilience against external market shocks in the process.

The leverage variable captures the debt composition within a firm's financing structure, gauging how heavily it leans on external capital. This study adopts the Debt-to-Equity Ratio (DER) as its primary proxy; the higher the DER, the more a firm's operations tilt toward debt financing over equity. Mustikasari et al. (2025) frame capital structure as a critical piece of corporate financial management, since it reflects how firms weigh debt against equity; sound management of that structure, in turn, underpins business continuity, sharpens resource efficiency, and strengthens long-term performance. Through the lens of Signaling Theory, highly leveraged firms have an incentive to send positive signals to investors and creditors via fuller disclosure. Environmental, Social, and Governance (ESG) disclosure included, a step expected to ease information asymmetry, build stakeholder trust, and firm up positive perceptions of the firm's prospects and sustainability.

A firm's leverage position leaves its mark on how transparently it presents sustainability reports, a pattern confirmed repeatedly in prior work. Jiang and Tang (2023), for instance, find a tight correlation between voluntary reporting commitment and a firm's strategic readiness to meet public accountability demands from stakeholders. The pressure to protect reputation only intensifies as reliance on external capital grows, since heavily indebted issuers find themselves compelled to widen disclosure to win over external sympathy and trust.

Kumar et al. (2023) reach a similar conclusion, arguing that such disclosure strategies aim to win the confidence of capital providers, satisfy creditors' contractual terms, and rein in agency costs stemming from high external debt ratios. Rising leverage, in this light, becomes a driving force nudging firms to widen ESG reporting as a signal of optimism directed at capital markets.

H1: Leverage is expected to exert a positive and significant effect on ESG disclosure.

Firm size stands in for the operational scale of a business entity, typically derived from its total assets; this study transforms that figure into the natural logarithm of total assets (Ln Total Assets) as its main proxy. Large corporations enjoy an edge in pursuing ESG agendas in depth thanks to their deeper resource base, while heightened public expectation and scrutiny push those same large entities to widen disclosure just to safeguard social standing. Signaling theory accounts for the pattern: firms of considerable size typically lean on comprehensive ESG reporting as a channel for projecting a favorable impression to investors.

Academic literature consistently ranks business size among the key determinants of ESG disclosure. Grassa et al. (2026) show that large corporate scale breeds both high public visibility and elevated legitimacy risk, pushing management to widen ESG disclosure as a tactical response to close stakeholder scrutiny. Awwad et al. (2026) add another angle: firm size sets the financial capacity and operational reach for allocating resources toward funding social, environmental, and economic governance, which ultimately lifts corporate market value. Taken together, these findings reinforce a pattern in which firm size growth tracks alongside an escalation in ESG disclosure.

H2: Firm size is expected to exert a positive and significant effect on ESG disclosure.

As a macroeconomic gauge, Gross Domestic Product (GDP) tracks a country's rate of economic growth while capturing conditions that can ripple into corporate activity, sustainability practice included; this study proxies it with the annual growth rate. Signaling theory holds that firms often step up reporting intensity and ESG activity as a positive market signal precisely when economic conditions turn favorable. Legitimacy theory adds another layer: rising national economic well-being gives the business sector greater capacity to meet public expectations around social commitment and environmental sustainability.

The tie between macroeconomic conditions and corporate sustainability practice has long shown up in prior work. Husain et al. (2025) single out economic stability, particularly swings in Gross Domestic Product (GDP), as a key external indicator shaping how corporations adopt and report ESG frameworks to sustain market performance. Empirically, Meinhold et al. (2026) find a direct relationship between a country's GDP per capita and firms' capacity for, and commitment to, environmental responsibility, since a robust national economy cultivates an ecosystem that nudges management toward greater non-financial transparency. (Safitri et al., 2025a) add that

macroeconomic stability affords manufacturing firms more room to maneuver and easier access to capital for shifting from conventional business models toward sustainability-based practice. In short, healthy economic growth pushes firms to implement and disclose ESG more actively.

H3: GDP is expected to exert a positive and significant effect on ESG disclosure.

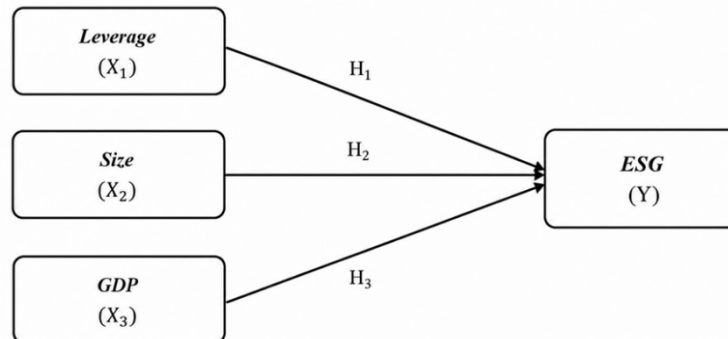


Figure 2. Conceptual Framework

Method

This study adopts a causal-associative design with a quantitative approach to unpack how leverage, firm size, and Gross Domestic Product bear on the level of ESG disclosure, a method that opens the door to measurable statistical testing of the relationships under study.

The population of this study comprises all Basic Materials sector companies listed on the Indonesia Stock Exchange (IDX) during the 2021-2024 research period, narrowed through purposive sampling to yield a representative sample. Screening criteria included continuous manufacturing-sector listing across 2021-2024, complete publication of both financial and sustainability (ESG) reports, full availability of variable data, and financial documents denominated in Indonesian Rupiah.

Table 1. Sample Selection

No	Criteria	Total
1	Basic Materials sector companies consistently listed on the Indonesia Stock Exchange (IDX) during the 2021–2024 period	93
2	Companies that did not publish annual financial statements consecutively during the study period	9
3	Companies that did not use Indonesian Rupiah (IDR) as the reporting currency in their financial statements	24
Total sample companies		21
Total panel data observations (21 companies × 4 years)		84

Source: Source: Authors' calculations (2026).

This study draws on secondary data gathered from formal sources, annual reports and sustainability reports chief among them, rounded out by supplementary information from corporate websites and reliable financial databases. The panel data model applied here merges time-series and cross-sectional characteristics.

ESG disclosure is treated as the dependent variable in this study's operational design, estimated through the ESG Disclosure Score, which measures the share of environmental, social, and governance items a firm reports against the full disclosure matrix required. Three predictors serve as independent variables: leverage, firm size, and Gross Domestic Product (GDP). Leverage is measured through the Debt-to-Equity Ratio (DER), comparing total debt against equity; firm size through the natural logarithm of total assets (Ln Total Assets); and GDP through its growth rate.

EViews handles the data processing here, running through a sequence of statistical procedures from descriptive analysis to multiple linear regression. The data profile is mapped first through descriptive statistics (standard deviation, mean, minimum-maximum range), then run through classical assumption tests (multicollinearity and heteroscedasticity) to secure its econometric validity. Multiple

linear regression serves as the core instrument for gauging how leverage, firm size, and Gross Domestic Product relate to ESG disclosure, with that relationship's strength tested via the t-test (partial) and F-test (joint), alongside the coefficient of determination (R²) to gauge how much of the variation in the dependent variable the explanatory variables can account for.

Table 2. Definition and Measurement of Variables

Variable	Variable Definition	Indicator
Leverage	Leverage refers to the extent to which a firm uses debt to finance its operating activities and assets. The level of leverage can influence a firm's ESG disclosure policy (Manuputty et al., 2025; Mustikasari et al., 2025).	DER = Total Liabilities / Total Equity
Firm Size	Firm size indicates a company's scale based on its total assets. Larger firms tend to have greater resources and higher transparency in ESG disclosure (Jais Rahmawati & Aris Eddy Sarwono, 2025; Rais & Adriansyah, 2026).	Firm Size = Ln (Total Assets)
Gross Domestic Product	GDP is an indicator of a country's economic growth that reflects economic conditions and can influence a firm's ESG implementation and disclosure (KPMG, 2024; Meinhold et al., 2026).	GDP Growth = (GDP _t – GDP _{t-1}) / GDP _{t-1} × 100%
Environmental, Social, and Governance (ESG) Disclosure	ESG Disclosure refers to the disclosure of information on a firm's environmental, social, and governance aspects as a form of transparency toward stakeholders (Rahman, 2021; Husain et al., 2025). ESG disclosure was measured using the content analysis method based on the Global Reporting Initiative (GRI) Standards. The ESG disclosure index consists of 87 indicators, including 31 environmental, 36 social, and 20 governance indicators. Each indicator was assigned a score of 1 if it was disclosed in the company's annual report or sustainability report and 0 if it was not disclosed. The ESG Disclosure Score was calculated as the ratio of the number of disclosed indicators to the total of 87 indicators, resulting in a score ranging from 0 to 1.	ESG Disclosure Score = $\sum X_{ij} / n_j$ Notes: X_{ij} = 1 if item i is disclosed by firm j , 0 if not disclosed; n_j = total number of disclosure items required for firm j .

Multiple Linear Regression Analysis

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$$

Notes:

Y = ESG

α = Constant

$\beta_{1,2,3}$ = Regression Coefficients

X_1 = Leverage

X_2 = Size

X_3 = Gross Domestic Product (GDP)

E = Error

Results and Discussion

This section walks through the statistical test results in sequence, descriptive statistics, panel data model selection, classical assumption tests, and hypothesis testing, before moving into an in-depth discussion of each finding.

The following presents the statistical test results conducted to assess the model's fit and the research hypotheses.

Descriptive statistics come first, sketching the broad characteristics of the research data across the ESG, leverage, firm size, and GDP variables.

Table 3. Descriptive Statistics

	LAVERAGE	SIZE	GDP	ESG
Mean	0.58	14.64	19899130.95	0.47
Median	0.40	14.95	20240404.20	0.45
Maximum	19.27	18.23	22138964.00	1.00
Minimum	-7.73	10.40	16976751.40	0.11
Std. Dev.	2.44	1.93	1924612.90	0.25
Skewness	4.80	-0.24	-0.46	0.39
Kurtosis	43.70	2.30	1.85	2.33
Jarque-Bera	6122.25	2.48	7.55	3.69
Probability	0.00	0.29	0.02	0.16
Sum	48.80	1229.68	167152699...	39.48
Sum Sq.	523.82	18311.27	335693778...	23.61
Sum Sq. Dev.	495.47	309.82	307443190...	5.05
Observations	84	84	84	84

Source: Data processed using EViews 13, 2026

A fairly wide spread in the data emerges from the descriptive analysis, pointing to considerable variation in characteristics across observations. The average ESG score sits at 0.47 (a moderate disclosure level), topping out at 1.00. Leverage (DER) averages 0.58, reflecting differences in financing structure across firms, while firm size averages 14.64, pointing to a sample dominated by medium- to large-scale entities. GDP carries a high average with considerable fluctuation, tracking the dynamism of prevailing economic conditions. Standard deviation values confirm the data's spread further, while the Jarque-Bera test flags some variables as not normally distributed.

Landing on the right panel data model is what secures valid and efficient estimation, so the Chow test and Hausman test run in stages to weigh the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) against each other.

The Chow test settles the question between CEM and FEM: a Cross-section F probability under 0.05 tips the scale toward FEM, at which point testing moves on to the Hausman stage.

Table 4. Chow Test

Redundant Fixed Effects Tests			
Equation: REM			
Test cross-section fixed effects			
Effects Test	Statistic	d.f.	Prob.
Cross-section F	10.880723	(20,60)	0.0000
Cross-section Chi-square	128.678655	20	0.0000

Source: Data processed using EViews 13, 2026

The Cross-section F probability recorded in the table above comes to 0.0000, well under the 0.05 threshold, settling FEM as the chosen model and sending the analysis onward to the Hausman test. The Hausman test then decides between REM and FEM: a probability value above 0.05 points to REM as the more efficient estimation model.

Table 5. Hausman Test

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	0.000000	3	1.0000

Source: Data processed using EViews 13, 2026

The probability value in the table above lands at 1.0000, comfortably above 0.05, confirming REM as the model applied.

Table 6. Lagrange Multiplier Test

Lagrange Multiplier Tests for Random Effects
Null hypotheses: No effects
Alternative hypotheses: Two-sided (Breusch-Pagan) and one-sided (all others) alternatives

	Test Hypothesis		
	Cross-section	Time	Both
Breusch-Pagan	62.63415 (0.0000)	1.779940 (0.1822)	64.41409 (0.0000)
Honda	7.914174 (0.0000)	-1.334144 (0.9089)	4.652784 (0.0000)
King-Wu	7.914174 (0.0000)	-1.334144 (0.9089)	1.614168 (0.0532)
Standardized Honda	8.398595 (0.0000)	-0.869174 (0.8076)	2.023061 (0.0215)
Standardized King-Wu	8.398595 (0.0000)	-0.869174 (0.8076)	-0.454667 (0.6753)
Gourieroux, et al.	--	--	62.63415 (0.0000)

Source: Data processed, 2026

The Lagrange Multiplier (LM) test puts the Breusch-Pagan probability for the Both category at 0.0000, below the 5% (0.05) significance threshold, leading to the rejection of H0 and acceptance of H1. That significant individual (cross-section) effect in the panel data is precisely what makes REM outperform CEM in accounting for the variation in the data.

Classical assumption tests confirm the model meets econometric requirements and yields unbiased estimates. A multicollinearity test checks for high correlation among the independent variables, using the Variance Inflation Factor (VIF) as the yardstick; a VIF below 10 signals the model is clear of that problem.

Table 7. Multicollinearity Test

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	0.089873	165.0034	NA
LAVERAGE	9.41E-05	1.077528	1.019216
SIZE	0.000150	59.90033	1.013483
GDP	1.50E-16	109.8958	1.006475

Source: Data processed using EViews 13, 2026

With every VIF value sitting below 10, the research model can be confirmed free of multicollinearity. The heteroscedasticity test checks whether residual variance holds steady across observations in the regression model, since any inconsistency there can erode estimator efficiency, reason enough to keep this test in the panel data workflow.

Table 8. Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.842162	0.788990	1.067392	0.2901
LAVERAGE	0.002415	0.003586	0.673473	0.5032
SIZE	-0.036088	0.054832	-0.658155	0.5130
GDP	-1.21E-08	3.20E-09	-3.794904	0.0003

Source: Data processed using EViews 13, 2026

The heteroscedasticity test puts the probability values at 0.5032 for leverage, 0.5130 for firm size, and 0.0003 for GDP. The first two, sitting above 0.05, show no heteroscedasticity; GDP, by contrast, points to potential heteroscedasticity given its probability below 0.05. That symptom in GDP does not undercut the validity of the overall t-test results, though, because the analysis method chosen here, the Random Effect Model (REM), rests on Generalized Least Squares (GLS) estimation. The GLS/REM approach carries the built-in advantage of automatically taming heteroscedasticity across firms and observation years alike, so every significance value and regression coefficient this model produces stays valid and free of variance bias.

Three tools, the t-test, F-test, and coefficient of determination (R^2), evaluate how each independent variable bears on the dependent variable, both individually and jointly.

The t-test checks the partial effect of leverage, firm size, and GDP on ESG disclosure, with the 0.05 significance threshold serving as the cutoff for whether a variable's effect counts as meaningful.

Table 9. T-Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-1.102688	0.346945	-3.178276	0.0021
LAVERAGE	-0.000440	0.007249	-0.060701	0.9517
SIZE	0.039619	0.022233	1.782029	0.0785
GDP	4.99E-08	6.60E-09	7.565241	0.0000

Source: Data processed using EViews 13, 2026

The probability values for leverage (0.9517) and firm size (0.0785), both above 0.05, show that neither variable carries enough statistical weight to explain the variation in ESG disclosure. GDP tells a different story: its probability of 0.0000, well under 0.05, confirms a positive and significant effect on ESG, a signal that improving economic conditions track alongside firms stepping up their ESG practice and transparency.

The F-test checks the combined effect of all independent variables on the dependent variable, with the model counted as statistically significant when the F-statistic probability falls below 0.05.

Table 10. F-Test

R-squared	0.440934	Mean dependent var	0.135636
Adjusted R-squared	0.419969	S.D. dependent var	0.150138
S.E. of regression	0.114345	Sum squared resid	1.045980
F-statistic	21.03190	Durbin-Watson stat	1.453538
Prob(F-statistic)	0.000000		

Source: Data processed using EViews 13, 2026

The F-statistic probability recorded in the table above comes to 0.000000, well under 0.05, confirming that Leverage, Size, and GDP jointly exert a significant effect on ESG.

The coefficient of determination (R^2) test gauges how much of the variation in the dependent variable the independent variables can explain, ranging from 0 to 1, where a higher value points to a stronger model fit.

Table 11. Coefficient of Determination Test

R-squared	0.440934	Mean dependent var	0.135636
Adjusted R-squared	0.419969	S.D. dependent var	0.150138
S.E. of regression	0.114345	Sum squared resid	1.045980
F-statistic	21.03190	Durbin-Watson stat	1.453538
Prob(F-statistic)	0.000000		

Source: Data processed using EViews 13, 2026

R-squared comes to 0.440934, with adjusted R-squared at 0.419969. In practical terms, 44.09% of the variation in the dependent variable traces back to leverage, size, and GDP, while the remaining 55.91% owes to factors outside the model. Adjusted R-squared, after accounting for the number of independent variables, confirms the model explains that same 41.99% share of variation, leaving 58.01% attributable to factors beyond this study's scope.

Discussion

Panel data regression under the Random Effect Model (REM) puts leverage's probability value at 0.9517, above the 0.05 significance threshold, confirming that leverage carries no significant effect on Environmental, Social, and Governance (ESG) disclosure, so the first hypothesis (H1) is rejected.

Debt levels, it appears, are not what drives firms here to widen their ESG disclosure. Highly leveraged firms tend to channel resources toward meeting financial obligations and managing capital structure rather than expanding voluntary sustainability disclosure. This failure of leverage to spur ESG disclosure likely traces back to how heavily indebted firms orient themselves toward debt-covenant compliance and creditor expectations that lean on solvency indicators and cash flow rather than environmental or social performance. Creditors in Indonesia's manufacturing sector across 2021-2024 typically size up risk through conventional financial ratios alone, leaving little incentive to signal through ESG disclosure. Signaling Theory, which treats information disclosure as a positive signal that eases information asymmetry and firms up investor and creditor trust, does not hold up here: high leverage went unaccompanied by any push to signal positively through ESG. That finding runs counter to Jiang and Tang (2023), who found leverage exerting a positive effect on ESG disclosure, a divergence explainable by this study's sample, confined to Indonesian manufacturing across 2021-2024, a setting where institutional investor pressure for sustainability has not yet caught up to the markets underlying that earlier work. A similar mismatch surfaces against Kumar et al. (2023), suggesting the direction and strength of leverage's effect on ESG disclosure shifts with differences in sector, period, and regulatory pressure across markets.

Firm size's probability value comes to 0.0785, still above the 0.05 threshold, so the second hypothesis (H2) is likewise rejected: firm size carries no significant effect on Environmental, Social, and Governance (ESG) disclosure. The regression coefficient does point positive, yet asset size has not proven strong enough to meaningfully lift ESG disclosure. Total assets, it turns out, are not the dominant force behind the extent of ESG disclosure in Indonesian manufacturing, large firms here do not necessarily face the same intensity of institutional investor and stakeholder pressure for ESG transparency found in more developed markets, so scale does not automatically translate into wider sustainability disclosure. The positive coefficient direction does hint at a tendency for larger firms to disclose more sustainability information, though the statistical evidence is not yet solid enough to confirm it.

This finding lines up with Jais Rahmawati and Aris Eddy Jais and Aris Eddy (2025), who likewise found firm size carrying no significant effect on ESG disclosure, confirming that larger firms are not automatically more transparent about ESG than smaller ones. That overlap makes sense given both studies are set among Indonesian firms, where sustainability disclosure decisions hinge more on management commitment and internal policy than on asset size alone. Signaling Theory fits the pattern: firm size offers no guarantee that management will feel compelled to send a positive signal through ESG disclosure, since the motivation to signal rests more on sustainability strategy and commitment than on how large total assets happen to be.

Unlike the two variables above, Gross Domestic Product (GDP) does exert a positive and significant effect on Environmental, Social, and Governance (ESG) disclosure, with a probability value of 0.0000, well under 0.05, confirming the third hypothesis (H3). The logic runs simply enough: the healthier the economy, the greater a firm's capacity to allocate resources toward implementing and disclosing ESG. Signaling Theory accounts for this through ESG disclosure's role as a positive signal of sustainability commitment to investors and stakeholders, while Legitimacy Theory adds another layer: strong economic growth also raises legitimacy pressure, making expanded ESG disclosure a way of keeping business activity aligned with the values and expectations of a society whose standards rise alongside economic progress. The two theoretical lenses complement each other in explaining how macroeconomic conditions push firms to communicate their sustainability commitments.

Husain et al. (2025) lend further support here, arguing that economic stability, GDP growth included, is an external factor driving ESG implementation and reporting. Meinhold et al. (2026) add similar evidence: countries with higher GDP levels tend to host firms more committed to environmental responsibility and non-financial transparency. (Safitri et al., 2025a) round this out, explaining that strong economic conditions give firms room to weave sustainability practice into business strategy, lifting ESG performance and building firm value over the long run.

Conclusion

This study set out to examine how leverage, firm size, and Gross Domestic Product (GDP) shape Environmental, Social, and Governance (ESG) disclosure among manufacturing firms on the Indonesia Stock Exchange across 2021-2024. Leverage and firm size proved to carry no significant effect on ESG disclosure, while GDP came through positive and significant, a pattern showing that ESG disclosure among manufacturing firms owes more to macroeconomic conditions than to internal firm traits, so signaling theory finds support here only through the GDP-ESG disclosure relationship. Firms would do well to keep raising the quality of their ESG disclosure as a mark of transparency toward investors and stakeholders, not only when the economy is expanding but as a fixture of sustainable business strategy in its own right. For investors, these findings offer one more yardstick for evaluating a firm's sustainability commitment, while regulators would do well to keep reinforcing ESG disclosure policy and guidance so implementation grows more consistent across industry sectors.

This study's reach stays limited to three independent variables, leverage, firm size, and GDP, within manufacturing firms observed across 2021-2024 alone. Future research would benefit from widening the variable set to capture other potential drivers of ESG disclosure and extending the observation period, painting a more comprehensive picture of how ESG practice continues to evolve.

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