

Revisiting the ESG–Firm Value Nexus: The Mediating Role of Intellectual Capital in Indonesia's Energy Sector

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ABSTRACT

This study examines the relationship between ESG disclosure, intellectual capital (IC), and firm value in Indonesia's energy sector, analyzing 34 companies listed on the Indonesia Stock Exchange (2022–2024). Four hypotheses were tested: (1) ESG's effect on firm value, (2) ESG's effect on IC, (3) IC's effect on firm value, and (4) IC's mediating role in the ESG–firm value link. Using GRI standards for ESG disclosure, VAIC as an IC proxy, and PBV/Tobin's Q for firm value, the study applied PLS-SEM via SmartPLS 4. Results revealed that ESG and IC together explained only 2.9% of firm value variation ($R^2 = 0.029$), with all path coefficients statistically insignificant at the 5% level. Specifically, ESG had a negligible negative effect on firm value ($\beta = -0.123$, $p = 0.159$) and IC ($\beta = -0.006$, $p = 0.926$), while IC's impact on firm value was also insignificant ($\beta = 0.116$, $p = 0.166$). The indirect effect of ESG on firm value via IC was similarly weak ($\beta = -0.001$, $p = 0.947$). The findings suggest that in Indonesia's energy sector, traditional financial metrics outweigh ESG or IC in driving market valuation. This challenges theoretical frameworks such as stakeholder theory, legitimacy theory, and the resource-based view, indicating their limited applicability in certain institutional and sectoral contexts.

ABSTRAK

Investor di pasar modal Indonesia semakin mempertimbangkan faktor ESG (Environmental, Social, and Governance) dalam keputusan portofolio mereka, namun hubungan empiris antara pengungkapan ESG dan nilai perusahaan di sektor padat modal masih belum konklusif. Penelitian ini menguji empat hipotesis: (1) pengaruh ESG terhadap nilai perusahaan, (2) pengaruh ESG terhadap modal intelektual, (3) pengaruh modal intelektual terhadap nilai perusahaan, dan (4) peran mediasi modal intelektual dalam hubungan ESG–nilai perusahaan. Sampel terdiri dari 34 perusahaan sektor energi yang terdaftar di Bursa Efek Indonesia selama 2022–2024 (102 observasi panel), dipilih secara purposive sampling. Pengungkapan ESG diukur dengan standar GRI; modal intelektual diprosikan dengan VAIC; nilai perusahaan diukur melalui Price-to-Book Value (PBV) dan Tobin's Q. Analisis menggunakan PLS-SEM melalui SmartPLS 4. Hasil menunjukkan bahwa ESG dan modal intelektual bersama-sama hanya menjelaskan 2,9% variasi nilai perusahaan ($R^2 = 0,029$), dengan seluruh koefisien jalur tidak signifikan pada level 5% (ESG → nilai perusahaan: $\beta = -0,123$, $p = 0,159$; ESG → modal intelektual: $\beta = -0,006$, $p = 0,926$; modal intelektual → nilai perusahaan: $\beta = 0,116$, $p = 0,166$; efek tidak langsung: $\beta = -0,001$, $p = 0,947$). Temuan ini mengindikasikan bahwa di sektor energi Indonesia, faktor fundamental keuangan bukan pengungkapan ESG maupun modal intelektual masih mendominasi penilaian pasar.

Keywords: ESG; Intellectual Capital; Firm Value; PLS-SEM; Energy Sector; Indonesia

1. Introduction

Energy companies on the Indonesia Stock Exchange (IDX) occupy a structurally important position in the national economy—they support industrial output, household energy needs, and broader economic growth. The sector draws investors partly because of its links to national energy security, global commodity trends, and its traditional role as an inflation hedge. That appeal, however, comes with complications: high capital requirements, significant environmental exposure, and sensitivity to commodity prices and regulatory shifts make it genuinely high-risk territory (Brigham, E. F., & Houston, 2026). Before committing capital, investors need a rigorous view of company quality, and firm value - typically captured through market-based ratios - is where that assessment ends up.

Measured by Tobin's Q, average firm value across IDX energy companies moved from 3.86 in 2019, dipped to 3.83 in 2020, climbed to 4.02 in 2022, and then eased back to 3.98 in 2023. This pattern is not random noise; it closely tracks commodity price cycles, post-pandemic recovery dynamics, and shifting regulatory expectations around the energy transition. What it does not obviously track, at least in this period, is ESG disclosure performance, which raises the first empirical puzzle this paper tries to resolve.

ESG (Environmental, Social, and Governance) disclosure has become a routine expectation for listed companies worldwide. Stakeholder theory predicts that companies meeting stakeholder sustainability expectations earn better legitimacy, lower risk premiums, and higher valuations (Ningwati, L., Hidayat, R., & Putri, 2022). Legitimacy theory argues that ESG disclosure closes the gap between corporate behaviour and social expectations, eventually feeding into market perception (Dowling & Pfeffer, 1975). The empirical record, though, is divided. (Quintiliai, 2022), (Wong et al., 2021), (Tahmid, 2022), (Wu, M., Shen, C., & Chen, 2022), and (Ilma, N., & Wahyuni, 2025) find positive, significant effects of ESG on firm value. (Xaviera & Rahman, 2023) and (Gultom & Alexander, 2025) do not. This is not a minor disagreement at the margins—it suggests the ESG-value link is genuinely context-dependent.

A potential explanation for this inconsistency is that ESG does not affect firm value directly but operates through an intermediate mechanism. Intellectual capital - comprising human capital, structural capital, and relational capital - is one candidate (Barney, 1991). Under the resource-based view (RBV), firms that embed ESG practices into their knowledge management, talent development, and

stakeholder relationships should gradually accumulate intellectual capital that is hard to replicate and, eventually, should be reflected in market valuations. (Karyani & Perdiansyah, 2022) find support for an ESG-intellectual capital link in Indonesian data. (Salvi et al., 2020), (Loen, 2022), and (Holly S., Brown T., 2025) find intellectual capital positively related to firm value, though (Hallauw & Widyawati, 2021) and (Tampubolon, Joyakin, 2021)(Tampubolon & Suzan, 2024) do not.

What is still missing from the literature is a rigorous test of this mediation chain in the energy sector specifically - a sector where the ESG-value relationship should be most contested, given the sector's environmental exposure, large capital base, and Indonesia's developing-market context. Prior studies examining ESG, intellectual capital, and firm value together (Pramesti, D., Yulianto, A., & Sari, 2024); (Anggarista, R., Putri, N., & Mahendra, 2024); (Prayogo, H., Setiawan, D., & Kusuma, 2025); (Lokman, A., & Luthan, 2025) have not positioned intellectual capital as a mediator in this particular setting. This gap motivates the present study.

Therefore, this study aims to (1) test whether ESG disclosure has a significant effect on firm value; (2) test whether ESG disclosure has a significant effect on intellectual capital; (3) test whether intellectual capital has a significant effect on firm value; and (4) test the mediating role of intellectual capital in the ESG-firm value relationship—among energy-sector companies listed on the IDX over 2022–2024.

2. Literature Review and Hypothesis Development

2.1 Firm Value

Firm value reflects what the market believes a company is worth as a going concern—it integrates investor expectations about future cash flows, risk, and governance quality (Utomo S, 2019); (Suad Husnan, 2015). In this study, firm value is measured using two complementary market-based ratios: Price-to-Book Value (PBV) and Tobin's Q. PBV compares the market price of a share to its book value, capturing how investors rate net equity relative to reported accounting values; a higher PBV signals optimism about growth prospects (Brigham, E. F., & Houston, 2026) Tobin's Q - defined as market capitalization plus book value of debt, divided by total assets - is more robust to accounting differences because it benchmarks current market valuation against an asset's estimated replacement cost (Margaretha, 2014). Using both proxies strengthens measurement validity and allows cross-checking of consistency.

Firm worth is quantified herein using the Price-to-Book (PBV) ratio and Tobin's Q metric. Price to

Book Value (PBV) is a ratio that compares the market price of shares with book value per share. PBV shows how much the market values the company's net value (equity) recorded in financial statements. If PBV is high, it means investors value the company as having good prospects and performance in the future. PBV reflects how investors value company performance and growth prospects (Brigham, E. F., & Houston, 2026).

$$PBV = \frac{\text{Share}}{\text{Book}}$$

Tobin's Q represents the proportion of corporate market capitalization plus the replacement value of assets. This formulation renders the Q ratio more robust than market-to-book ratios, as it contrasts true current valuation with hypothetical reconstruction costs (Margaretha, 2014).

$$\text{Tobin's Q} = \frac{\text{Market Value of Equity} + \text{Book Value of Debt}}{\text{Total Asset}}$$

2.2 Stakeholder Theory

Stakeholder theory holds that a company's long-term performance depends on its ability to identify, understand, and respond to the interests of all groups that affect or are affected by its operations - shareholders, employees, suppliers, communities, and regulators (Ningwati R., Suhardi D., 2022). Under this view, ESG disclosure is not merely regulatory compliance; it is a signal to stakeholders that the company takes their interests seriously. When that signal is credible and consistent, stakeholders extend greater support - through customer loyalty, employee retention, and reduced regulatory friction - which should eventually translate into higher and more stable market valuations (Nugroho B., 2022).

2.3 Legitimacy Theory

Legitimacy theory, as formulated by (Dowling & Pfeffer, 1975), proposes that firms operate under an implicit social contract: society tolerates corporate activity as long as the firm's behaviour aligns with prevailing social values and norms. ESG disclosure is, in this framework, a legitimacy management tool. By reporting on environmental practices, social initiatives, and governance structures, companies demonstrate alignment with what society currently expects and thereby reduce the risk that operations will be disrupted by regulatory action or reputational damage. The theory predicts that companies with stronger ESG disclosure - and therefore lower legitimacy gaps - should face lower risk premiums and, over time, higher valuations. The critical question, which this study addresses, is whether this mechanism actually operates in Indonesia's energy sector within the observed three-year window.

2.4 Environment, Social and Governance (ESG)

ESG integrates environmental stewardship,

social responsibility, and governance quality into a single framework for assessing non-financial corporate performance (Bukreeva A., 2023). In this study, ESG disclosure is measured using the Global Reporting Initiative (GRI) framework, which provides structured, internationally recognized indicators across economic (Series 200), environmental (Series 300), and social (Series 400) dimensions. The ESG disclosure index is computed as follows:

$$\text{ESG Disclosure Index} = \frac{\text{Number of GRI items disclosed}}{\text{Total number of relevant GRI items}}$$

The GRI framework was chosen because it is the most widely adopted sustainability reporting standard in Indonesia, and its item-level structure allows consistent scoring across companies and years. Items are scored as 1 (disclosed) or 0 (not disclosed), and all items are consistently applied across the sample to ensure comparability.

2.5 Intellectual Capital (IC)

IC refers to the stock of knowledge-based assets that a company uses to create economic value, encompassing human capital (employee skills, expertise, and motivation), structural capital (processes, systems, and routines), and relational capital (relationships with customers, suppliers, and other stakeholders) (Stewart, 1997); (Barney, 1991). IC is proxied In this study, IC is proxied by the Value Added Intellectual Coefficient (VAIC), calculated as follows:

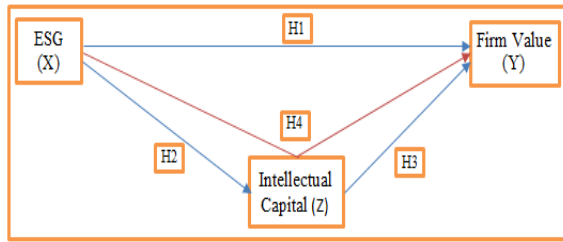
$$VAIC = VACA + VAHU + STVA$$

where VACA (Capital Employed Efficiency) = VA / Capital Employed; VAHU (Human Capital Efficiency) = VA / Human Capital; STVA (Structural Capital Efficiency) = Structural Capital / VA; and VA (Value Added) = Output - Input, derived from audited financial statements following Pulic (2004). VAIC is widely used in the IC literature because it relies on publicly available financial data, enabling replication and cross-company comparison.

One acknowledged limitation of VAIC is that it is backward-looking and may not capture the dimensions of IC most closely linked to ESG—such as organizational culture, social innovation, or reputational assets—since these do not appear explicitly in financial statements. This measurement constraint is relevant to interpreting the results and is discussed further in Section 4.

2.6 Hypothesis Development

Figure 1 shows the conceptual framework, which positions ESG as an exogenous variable, intellectual capital as a mediator, and firm value (measured by PBV and Tobin's Q) as the endogenous outcome.



H1: ESG has a positive effect on firm value.

Stakeholder theory and legitimacy theory both predict that companies demonstrating credible ESG commitment will attract broader stakeholder support, reduce perceived risk, and ultimately trade at higher valuations. Empirical support comes from (Quintiliani, 2022), (Wong et al., 2021), (Wu et al., 2022), (Tahmid, 2022), and (Ilma, N., & Wahyuni, 2025), although (Xaviera & Rahman, 2023) and (Gultom & Alexander, 2025) find no significant effect in the Indonesian context. The mixed evidence underscores the need to retest this relationship in the energy sector specifically.

H2: ESG has a positive effect on intellectual capital (IC).

The resource-based view holds that sustainable corporate practices drive investment in knowledge assets: companies with strong ESG commitments tend to invest more in employee development, organizational learning, and stakeholder relationships—all of which are dimensions of intellectual capital (Barney, 1991). (Karyani & Perdiansyah, 2022) and (Pham, T., Nguyen, H., & Tran, 2024) find empirical support for this link, though the evidence remains limited in the energy sector context.

H3: Intellectual capital positively affects firm value.

IC theory and the RBV argue that knowledge-based assets, when efficiently deployed, generate innovation, operational efficiency, and competitive advantages that investors price into valuations (Stewart, 1997); (Salvi et al., 2020); (Holly S., Brown T., 2025). The counterevidence from (Hallauw & Widyawati, 2021) and (Tampubolon, R., & Suzan, 2024) in Indonesian data suggests that this mechanism may be industry- or period-specific, reinforcing the rationale for testing it in the energy sector.

H4: Intellectual capital mediates the positive effect of ESG on firm value.

If ESG builds intellectual capital (H2) and intellectual capital enhances firm value (H3), then IC is a plausible transmission channel for ESG's effect on firm value—a chain consistent with the integrated logic of stakeholder theory, legitimacy theory, and the RBV (Barney, 1991); (Karyani & Perdiansyah, 2022). Testing this indirect path is the central methodological contribution of this study.

3. Research Method

3.1 Research Design

This study uses an explanatory design with secondary, archival data drawn from the annual reports and sustainability reports of IDX-listed energy companies for the years 2022–2024. PLS-SEM (Partial Least Squares - Structural Equation Modelling), implemented in SmartPLS 4, was chosen over regression-based or covariance-based SEM (CB-SEM) for three reasons: (1) the data distribution is significantly non-normal, as indicated by high skewness and kurtosis values (see Table 1); (2) the model contains single-indicator constructs (ESG Score, VAIC) alongside multi-indicator constructs (firm value proxied by PBV and Tobin's Q), which PLS-SEM handles more flexibly; and (3) the study is exploratory-predictive rather than confirmatory, making PLS-SEM a more appropriate tool (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2019).

3.2 Population and Sample

The population comprises all 74 energy sector companies listed on the IDX. Purposive sampling was applied with four criteria: (1) continuous listing in the IDX energy sector throughout 2022–2024; (2) full financial reporting available for all three years; (3) disclosure of ESG or sustainability information sufficient for GRI scoring; and (4) complete data for VAIC calculation (i.e., sufficient granularity in income and balance sheet data to derive Value Added and its components). Table 1 summarizes the sampling process.

Table 1. Sampling Process

Criterion	Companies	Observations
Energy companies listed on IDX 2022–2024	74	222
Less: incomplete financial reporting	(21)	
Less: no ESG/sustainability disclosure	(15)	
Less: insufficient data for VAIC computation	(4)	
Final sample	34	102

Source: Authors' compilation from IDX data, 2025

One potential limitation of this sampling approach is selection bias: companies excluded because they do not disclose sustainability information tend to be smaller

and less transparent than those that do. Therefore, the final sample likely overestimates ESG disclosure quality relative to the full population of IDX energy

companies, and generalization should be made cautiously.

3.3 Variable Operationalisation

Table 2. Operationalisation of Variables

Variable	Type	Indicator	Formula / Measurement	Data Source	Expected Sign
ESG	Exogenous	ESG Score	GRI disclosure index (items disclosed / total relevant items)	Sustainability reports, annual reports	+
Intellectual Capital	Mediating	VAIC	VACA + VAHU + STVA (Pulic, 2004)	Audited financial statements	+
Firm Value	Endogenous	PBV, Tobin's Q	PBV = Share Price / Book Value per Share; Tobin's Q = (Mkt Cap + Book Debt) / Total Assets	IDX database, annual reports	—

Source: Authors' compilation.

3.4 PLS-SEM Estimation

The outer model is evaluated using outer loadings (threshold: ≥ 0.70) for reflective indicators, following (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt, 2019). Average Variance Extracted ($AVE \geq 0.50$) and composite reliability (≥ 0.70) are used for convergent and construct reliability tests. Because all three constructs are measured by single indicators (or, for firm value, by two closely related market ratios), standard discriminant validity tests (HTMT, Fornell-Larcker) are not applicable, as noted in the SmartPLS output. The inner model is assessed via R^2 , path coefficients, and bootstrapping (5,000 subsamples, two-tailed, significance at $p < 0.05$). Indirect (mediation) effects are tested using specific indirect effects from the bootstrapping procedure. Collinearity was checked using Variance Inflation Factors (VIF); all VIF values were below 3.3, well within the acceptable threshold of 5.0 (Hair, J. F., Hult, G. T. M., Ringle, C. M., & Sarstedt,

2019). No extreme outlier removal was performed, but standardised scores were used to reduce scale sensitivity; the non-normal distribution of ESG and VAIC further validates the PLS-SEM approach.

4. Result and Discussion

4.1 Descriptive Statistics

All variables were standardized (z-scores); therefore, the means were zero and the standard deviations were one. The high skewness (4.51 for ESG, 4.55 for VAIC) and excess kurtosis values confirm significant non-normality and the presence of extreme observations in the ESG and IC data. This pattern is consistent with a sample in which a small number of companies report unusually high ESG scores or VAIC values—a common feature in emerging market energy data. Non-normality reinforces the appropriateness of PLS-SEM, which does not require multivariate normality.

Table 3. Descriptive Statistics of Research Variables (Standardised)

Variable	N	Mean	Median	Std Dev	Min	Max	Skewness	Kurtosis
ESG Score	102	0.000	-0.213	1.000	-0.830	6.767	4.510	25.896
Intellectual Capital (VAIC)	102	0.000	-0.166	1.000	-0.663	6.619	4.550	24.862
Firm Value (PBV)	102	0.000	-0.393	1.000	-0.873	4.907	2.180	5.846
Firm Value (Tobin's Q)	102	0.000	-0.361	1.000	-1.021	4.950	2.028	5.528

Source: SmartPLS 4 output, 2025

Table 4. Outer Loadings and Outer Weights

Indicator	Construct	Outer Loading	Outer Weight	Assessment
ESG Score	ESG	1.000	1.000	Valid
VAIC	Intellectual Capital	1.000	1.000	Valid
PBV	Firm Value	0.963	0.577	Valid
Tobin's Q	Firm Value	0.944	0.472	Valid

Source: SmartPLS 4 output, 2025. Note: Single-indicator constructs have outer loading = 1.000 by definition

All outer loadings exceed the 0.70 threshold, confirming convergent validity. ESG and VAIC are single-indicator constructs; therefore, their loadings are trivially 1.000. For the firm value construct, PBV (loading = 0.963) and Tobin's Q (loading = 0.944) both

load strongly, with PBV carrying slightly more weight (outer weight = 0.577 vs. 0.472), suggesting that book-relative market pricing captures a marginally greater share of firm value variation in this sample than asset-relative valuation.

4.3 Structural Model: R²

Table 5. R² Values

Endogenous Variable	R ²	R ² Adjusted
Intellectual Capital	0.000	-0.010
Firm Value	0.029	0.010

Source: SmartPLS 4 output, 2025

ESG explains essentially none of the variation in intellectual capital (R² = 0.000). The combined ESG and IC model explains only 2.9% of the variation in firm value, which falls well below Chin's (1998) threshold of 0.19 for 'weak' predictive power. This very low R² is itself an important finding: it indicates that the variables

omitted from the model - most likely profitability, leverage, firm size, and commodity price cycles - explain far more of firm value variation than ESG and intellectual capital combined during this period.

4.4 Hypothesis Testing

Table 6. Path Coefficients, t-Statistics, and p-Values

Path	β	Std Error	t-stat	p-value	Decision
ESG → Firm Value	-0.123	0.087	1.410	0.159	H1 Rejected
ESG → Intellectual Capital	-0.006	0.065	0.093	0.926	H2 Rejected
Intellectual Capital → Firm Value	0.116	0.084	1.386	0.166	H3 Rejected

Source: SmartPLS 4 bootstrapping output (5,000 subsamples), 2025. Significance threshold: $p < 0.05$.

Table 7. Specific Indirect Effect: ESG → IC → Firm Value

Indirect Path	β	Std Error	t-stat	p-value	Decision
ESG → IC → Firm Value	-0.001	0.008	0.066	0.947	H4 Rejected

Source: SmartPLS 4 bootstrapping output (5,000 subsamples), 2025

No path reached statistical significance. Because both the ESG → IC ($p = 0.926$) and IC → Firm Value ($p = 0.166$) paths were not significant, the conditions for mediation were not met; H4 is rejected.

5. Discussion

5.1 ESG to Firm Value (H1)

ESG disclosure does not significantly affect firm value in this sample ($\beta = -0.123$, $p = 0.159$). The negative direction is worth noting, though not decisive. In an energy sector undergoing a global transition, large-scale ESG implementation - meeting emission targets, upgrading technology, rehabilitating land - requires substantial capital outlays whose benefits are genuinely long-term. Investors in the 2022–2024 window, watching post-pandemic recovery and

commodity price volatility, appear to have weighted short-term profitability metrics more heavily than ESG scores. This is consistent with agency theory: resource allocation toward ESG activities is seen as diverting capital from more immediately productive uses, which can weigh on near-term earnings and valuations (Jensen, M. C., & Meckling, 1976).

Indonesia's context adds another layer. ESG disclosure quality is still uneven across listed companies, and without a standardised third-party verification requirement, investors have limited ability to distinguish substantive ESG progress from reporting-only compliance. Until that credibility problem is resolved, markets are unlikely to price ESG disclosure as a reliable signal of value creation. This result is consistent with (Xaviera & Rahman, 2023) and

(Gultom & Alexander, 2025), and contrasts with (Quintiliani, 2022), (Wong et al., 2021), and (Wu et al., 2022), whose positive findings come primarily from more advanced ESG disclosure environments.

5.2 ESG to Intellectual Capital (H2)

ESG has no meaningful effect on intellectual capital ($\beta = -0.006$, $p = 0.926$; $R^2 = 0.000$). Two explanations are most plausible. First, in many Indonesian energy companies, ESG management sits in sustainability or compliance functions, largely disconnected from HR, R&D, and knowledge management - the functions that actually drive VAIC components. Without deliberate integration, ESG investment does not translate into measurable human capital, structural capital, or relational capital improvements. Second, and more fundamentally, VAIC may not be sensitive to the dimensions of IC that ESG most plausibly builds. Organisational culture, social innovation, and reputational capital - exactly the channels through which ESG would likely operate - are not captured in value-added efficiency ratios derived from financial statements (Pham, T., Nguyen, H., & Tran, 2024). The measurement instrument and the theoretical mechanism may simply be misaligned.

5.3 Intellectual Capital → Firm Value (H3)

Intellectual capital does not significantly affect firm value ($\beta = 0.116$, $p = 0.166$). The positive coefficient direction is consistent with IC theory, but the effect is too weak to reach significance. In capital-intensive sectors like energy, investors focus primarily on physical assets, reserve bases, and financial efficiency ratios rather than human or structural capital metrics. VAIC, derived from accounting data, may also struggle to capture the forward-looking, innovation-linked aspects of IC that investors actually price. These findings align with (Hallauw & Widyawati, 2021) and (Tampubolon & Suzan, 2024), though they diverge from (Salvi et al., 2020) and (Holly S., Brown T., 2025), whose positive findings may reflect different sectoral and institutional environments.

5.4 Mediation by Intellectual Capital (H4)

The indirect effect of ESG on firm value through IC is negligible and statistically non-significant ($\beta = -0.001$, $p = 0.947$). This is not surprising: mediation requires that both the a-path (ESG → IC) and b-path (IC → Firm Value) carry meaningful variance. Neither does here. The broader implication is that the theoretically elegant chain - ESG builds knowledge assets, which markets price into firm value - does not operate as predicted in Indonesia's energy sector during this period. The prerequisites for that chain to work (deep, credible ESG integration, IC development beyond VAIC-measurable dimensions, and a market that capacity to assess and price non-financial information. Without these foundations, ESG investment will continue to look like a cost rather than a value driver.

recognises and prices intangible assets) are not yet consistently in place.

6. Conclusion

6.1 Summary of Findings

Testing four hypotheses on 34 IDX energy companies over 2022–2024, this study finds that ESG disclosure does not significantly affect firm value ($\beta = -0.123$, $p = 0.159$), ESG does not significantly affect intellectual capital ($\beta = -0.006$, $p = 0.926$), intellectual capital does not significantly affect firm value ($\beta = 0.116$, $p = 0.166$), and intellectual capital does not mediate the ESG–firm value relationship ($\beta = -0.001$, $p = 0.947$). All four hypotheses are rejected. ESG and IC together explain only 2.9% of firm value variation, indicating that traditional financial and operational fundamentals remain the dominant drivers of market valuation in this sector and period.

6.2 Theoretical Implications

The results suggest that the theoretical mechanisms drawn from stakeholder theory, legitimacy theory, and the resource-based view are context-specific rather than universally applicable. For these mechanisms to translate ESG and IC into firm value, at least three conditions seem necessary: ESG practices must be substantively integrated into core business operations (not just reported); the measurement tools for IC must be sensitive to the channels through which ESG builds intangible assets; and the capital market must have the analytical capacity to price non-financial information. In Indonesia's energy sector in 2022–2024, none of these conditions appears to be fully met. Non-significance does not mean these variables are unimportant - it means the theoretical mechanism has not yet materialised in this setting.

6.3 Practical Implications

For managers, the key message is that filing sustainability reports is not sufficient. ESG initiatives need to be woven into the core business model to drive operational efficiency, product innovation, and talent development, so they create value that shows up in performance metrics investors actually monitor. Equally, the IC dimensions most relevant to ESG (culture, innovation, and stakeholder networks) need to be communicated credibly to the market, beyond what VAIC alone can signal.

For regulators and policymakers, the weak ESG–value link points to structural gaps: ESG disclosure standards in Indonesia need to be strengthened and made more comparable and verifiable, and market participants need greater

6.4 Limitations and Future Research Directions

This study has several limitations that open directions for further work: (1) Important control variables -

profitability, leverage, firm size, macroeconomic conditions - were not included and likely account for the 97.1% of firm value variation unexplained by the model; future studies should incorporate these as structural controls. (2) VAIC may not fully capture the IC dimensions most relevant to ESG; alternative measures such as survey-based IC scales, patent data, or qualitative IC indices could yield different results. (3) Similarly, ESG measured via GRI content analysis may not reflect all relevant sustainability dimensions;

studies using Refinitiv, MSCI, or PROPER data would provide useful robustness checks. (4) The three-year observation window is too short to detect the long-term cumulative effects that ESG and IC theory predict; an observation period of five years or more would be more appropriate. (5) The single-sector focus limits generalisability; cross-sector comparisons - particularly with knowledge-intensive or consumer-facing sectors - would sharpen understanding of where and why ESG and IC matter for firm value.

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