

Research article

Sustainability Report Disclosures and Firm Value: Evidence from Indonesian Banks

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This study examines the dimension-specific associations between sustainability report (SR) disclosures and firm value within the Indonesian banking sector. Disaggregating GRI-based disclosure indicators into economic, environmental, and social dimensions, the analysis employs a fixed-effects panel specification on a balanced sample of three continuously reporting banks over the 2010–2023 period (42 bank-year observations). Firm value is proxied by Tobin's Q. Baseline estimates reveal a statistically significant positive association between social disclosure and Tobin's Q, a negative association for economic disclosure, and no statistically significant relationship for environmental disclosure. These empirical variations demonstrate that financial markets evaluate categories of non-financial disclosures heterogeneously. However, given the restricted sample size, the findings reflect conditional relationships specific to early SR adopters rather than generalizable industry-wide effects. The study highlights the necessity of disaggregating sustainability metrics in emerging market research and provides nuanced implications for standard-setters and financial institutions.

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1. INTRODUCTION

The increasing urgency of global climate challenges, rising societal expectations, and growing pressure for corporate accountability have elevated sustainability reporting (SR) to a central position in financial governance. This development is particularly relevant to banking because banks influence sustainability not only through their own operations but, more importantly, through credit allocation, investment decisions, risk assessment, and relationships with a broad range of stakeholders. Consequently, sustainability disclosure can provide financial-market participants with non-financial information that complements conventional accounting information when assessing a bank's risks, strategic orientation, stakeholder relationships, and longer-term prospects. Sustainability reporting therefore has potential valuation relevance when the information disclosed changes investors' expectations concerning future cash flows, risk exposure, reputation, or the institution's ability to maintain stakeholder support. In this context, Sustainability Reports, particularly those aligned with frameworks such as the Global Reporting Initiative (GRI), the Corporate Sustainability Reporting Directive (CSRD), and the Task Force on Climate-related Financial Disclosures (TCFD), have contributed to greater structure and comparability in communicating such non-financial information (Alroud, 2025; Anis et al., 2023). Rather than assuming that sustainability disclosure necessarily creates financial value, however, its valuation consequences depend on the type of information disclosed and how investors interpret its economic relevance.

Despite the increasing global adoption of sustainability disclosure, its relationship with corporate valuation remains theoretically and empirically ambiguous, particularly in emerging financial markets.

Greater disclosure may reduce information asymmetry and strengthen stakeholder confidence, thereby improving investors' assessment of future prospects. Conversely, extensive sustainability disclosure may reveal environmental or social exposures, implementation costs, regulatory risks, or commitments whose financial benefits are uncertain or realized only over longer horizons. The market response may therefore vary according to institutional development, investor attention, disclosure credibility, and the materiality of the information being reported. These considerations are particularly relevant in emerging markets, where sustainability-reporting institutions, external assurance, investor ESG awareness, and disclosure comparability may still be developing. Accordingly, evidence obtained in mature financial systems cannot automatically be generalized to emerging banking markets. For instance, Zheng et al. (2025) found that Eurozone banks with higher exposure to green SMEs report improved profitability and stability, measured through Net Interest Margin (NIM) and Z-score. These findings imply that sustainable finance, when strategically aligned with risk assessment mechanisms, can yield positive returns. Conversely, research on Ukrainian banks indicates that SR adoption remains fragmented and inconsistent, with most disclosures remaining qualitative and lacking actionable data (Onyshchenko et al., 2025). Such discrepancies reflect the uneven adoption of SR globally, underlining the need for empirical inquiry in emerging contexts such as Indonesia.

Evidence distinguishes reporting adoption from reporting quality. Bachoo et al. (2013) associate higher-quality Australian disclosures with lower equity costs and stronger expected performance, particularly in environmentally sensitive industries. Loh et al. (2017) find positive valuation associations for reporting adoption and quality in Singapore across sectors and ownership categories. Nguyen and Duong (2026) similarly associate GRI disclosure with higher Tobin's Q, stronger accounting performance, and lower risk in Vietnam. These findings motivate separate consideration of valuation, profitability, and risk, while their different institutional settings limit direct extrapolation to Indonesian banks.

Indonesia presents a compelling case for sustainability reporting in banking, given its dual status as a rapidly developing economy and a country increasingly integrating sustainability into its financial regulatory environment. The Financial Services Authority (OJK) issued Regulation No. 51/POJK.03/2017, mandating sustainability reporting for financial institutions, issuers, and public companies. The regulation represents an important institutional milestone, but the development of sustainability reporting among Indonesian banks has occurred gradually and unevenly. The issuance of OJK Regulation introduced formal sustainable finance mandates, establishing a critical institutional backdrop for assessing how non-financial disclosures correlate with market valuation in Indonesian banking. This distinction is necessary because identifying the causal regulatory effect would require a separate research design with an appropriate counterfactual, such as a valid difference-in-differences framework.

The empirical literature similarly provides mixed evidence regarding the relationship between sustainability disclosure and firm outcomes. Some studies associate greater sustainability transparency with stronger stakeholder relationships, reputation, and corporate performance, whereas others document insignificant or context-dependent relationships (Alroud, 2025; Anis et al., 2023; Linawati et al., 2022; Rahman et al., 2023). These inconsistencies suggest that treating sustainability reporting as a single homogeneous construct may conceal important differences among the information being disclosed. Economic, environmental, and social disclosures concern different corporate activities, address different stakeholder groups, and may convey different information to financial markets. Their valuation consequences should therefore not necessarily be expected to be identical.

Other evidence challenges a uniformly positive relationship. Friske et al. (2023) find a negative average association between voluntary reporting and Tobin's Q that becomes more positive over time, consistent with a costly signaling interpretation. Sani et al. (2020) find insignificant ESG associations among continuous Malaysian reporters but a positive valuation association among persistent sustainability-index members. Their contrast raises the possibility that reputation and sample selection influence observed relationships. Reporting continuity alone therefore does not establish financial benefits or justify extrapolation from selected reporters.

The economic dimension of sustainability disclosure can influence valuation through several competing channels. Information concerning economic performance, market presence, procurement practices, indirect economic impacts, and anti-corruption activities may reduce information asymmetry

and signal responsible resource management. From a signaling perspective, credible disclosure can enable investors to distinguish institutions with stronger long-term management practices. However, greater economic disclosure may also reveal costly commitments, operational constraints, compliance expenditures, or economic impacts whose benefits are difficult for investors to translate immediately into future cash flows. Consequently, there is no strong theoretical basis for assuming an exclusively positive valuation response. The valuation impact of economic disclosure remains theoretically ambiguous, as markets may weigh the benefits of reduced information asymmetry against compliance expenditures and costly commitments (Rahman et al., 2023; Cantero-Saiz et al., 2024).

Outcome selection also matters. Carolina et al. (2020) find that only economic disclosure is individually significant for ROE among 18 Indonesian firms, although the three disclosure dimensions are jointly significant. Their result supports disaggregation, but its profitability outcome does not establish how economic disclosure relates to market valuation. Accounting profitability and Tobin's Q capture different corporate outcomes.

Environmental disclosure operates through a different information channel. Although banks generally have a smaller direct environmental footprint than carbon-intensive industries, their lending and investment activities can expose them to environmental, climate, and transition risks. Environmental disclosure may therefore provide information concerning energy use, emissions, environmental risk management, and broader environmental responsibility. Under signaling theory, credible environmental information may communicate risk preparedness and longer-term strategic orientation. Under legitimacy theory, it may demonstrate conformity with increasingly important societal and regulatory expectations. Nevertheless, investors may attach limited valuation relevance to such information when environmental impacts are perceived as indirect, disclosure indicators are difficult to compare across institutions, or the financial consequences remain uncertain. Thus, the expected valuation relationship is theoretically plausible but not necessarily immediate or uniformly positive. Ammer et al. (2020) find a positive environmental disclosure association in Saudi Arabia, strengthened by board independence. Yadav and Hooda (2024) associate environmental and governance scores with airline valuation and financial performance. These results identify governance and sectoral context as relevant conditions; they do not establish that generic environmental disclosures have identical informational value in banking.

Social disclosure is more directly connected to stakeholder relationships through information on employees, occupational health and safety, human rights, local communities, customer welfare, and related social responsibilities. Stakeholder theory suggests that responsiveness to these groups can preserve relational capital, strengthen trust, reduce reputational risks, and support organizational legitimacy. For banks in particular, whose business models depend heavily on depositor, borrower, employee, regulator, and investor confidence, these stakeholder relationships may have financial relevance. Signaling theory further suggests that credible social disclosure can communicate management's commitment to maintaining these relationships. Consequently, social disclosure may influence Tobin's Q when investors expect stronger stakeholder relationships to support future cash flows or reduce firm-specific risk.

The three theoretical perspectives are therefore complementary but perform distinct analytical functions in this study. Stakeholder theory explains why sustainability information concerning relationships with employees, customers, communities, and other constituencies may have value implications. Signaling theory explains how observable sustainability disclosures can transmit information about otherwise difficult-to-observe organizational attributes and risk-management commitments to investors. Legitimacy theory explains why conformity with evolving social and regulatory expectations may affect organizational acceptance and reputational capital. Together, these perspectives suggest that sustainability disclosure may influence market valuation through information, stakeholder, risk, and legitimacy channels, while also explaining why economic, environmental, and social disclosures need not generate identical market responses.

Governance mechanisms also require differentiation. Zarefar et al. (2022) find that family ownership strengthens the disclosure–performance relationship in Indonesia. Agustia et al. (2022) report disclosure mediation for board tenure and nationality diversity. However, Dewi et al. (2023) find that gender diversity increases firm value while reducing disclosure and find no disclosure

mediation. These contrasting results discourage treating board diversity as a single mechanism. They also indicate that bank fixed effects cannot substitute for direct tests of changing governance characteristics.

Against this background, an important empirical gap concerns whether different dimensions of sustainability disclosure exhibit distinct relationships with market valuation in an emerging-market banking setting. Existing evidence remains heterogeneous across institutional contexts and frequently examines aggregate sustainability or ESG measures, potentially obscuring differences in the information content of individual disclosure dimensions. Evidence from Indonesian banking is particularly relevant because the sector combines increasing regulatory emphasis on sustainable finance with heterogeneous institutional characteristics and evolving sustainability-reporting practices. Rather than presuming that more disclosure uniformly increases firm value, examining the dimensions separately allows the analysis to identify whether markets associate economic, environmental, and social information differently with valuation.

A further gap concerns is about credibility. Thompson et al. (2022) associate reporting and external assurance with higher firm value in South Africa, but find no market distinction between big four and specialist assurance providers. Harymawan et al., (2020) report a positive assurance association in Indonesia and Malaysia while excluding financial firms. Their findings strengthen the rationale for banking-specific evidence, but the present disclosure indices do not test assurance effects. The contribution here is a contextual comparison of disclosure dimensions, rather than a test of every mechanism identified in the literature.

Accordingly, this study examines the association between economic, environmental, and social sustainability-report disclosures and firm value, measured by Tobin's Q, among Indonesian banks observed during 2010–2023. The analysis uses panel-data methods and incorporates leverage and firm size as firm-level controls. The study deliberately disaggregates GRI-based sustainability disclosure rather than imposing a single aggregate SR measure. This design enables comparison of the conditional associations of the three disclosure dimensions with market valuation. Because the available observations are drawn from banks with sufficiently consistent sustainability-reporting information, the empirical findings are interpreted as evidence for the observed sample rather than as estimates that can automatically be generalized to all Indonesian banks.

The study contributes in three respects. First, it provides dimension-specific evidence on sustainability disclosure and market valuation rather than assuming that economic, environmental, and social information has homogeneous financial relevance. Second, it examines these relationships in Indonesian banking, where sustainability-reporting practices have developed alongside an evolving sustainable-finance regulatory environment. Third, by integrating stakeholder, signaling, and legitimacy perspectives at the level of individual disclosure dimensions, the study provides a clearer theoretical explanation of how different sustainability information may enter investors' valuation assessments. This study contributes to the literature by disaggregating sustainability disclosures into economic, environmental, and social dimensions under a unified theoretical framework (stakeholder, signaling, and legitimacy theories), offering granular evidence on non-financial valuation in an emerging banking market.

2. RESEARCH METHODS

2.1. Data

This study employs a quantitative longitudinal approach to examine the association between Sustainability Report (SR) disclosures and firm value among Indonesian banks observed during 2010–2023. The term “association” is used deliberately because the observational panel design does not by itself establish a causal effect of sustainability disclosure on market valuation. Panel-data methods are employed because repeated observations for the same banks allow the estimation to account for time-invariant bank-specific heterogeneity that cannot be captured adequately in a purely cross-sectional specification (Baltagi, 2021). Sustainability disclosures are measured through content analysis based on Global Reporting Initiative (GRI) indicators and are separated into economic, environmental, and social dimensions.

The study uses secondary data obtained from annual reports, sustainability reports, and publicly available financial information for Indonesian banks listed on the Indonesia Stock Exchange (IDX) and registered with the Financial Services Authority (OJK). The observation period covers 2010–2023 because

sustainability-related disclosure by several Indonesian banks predates the formal sustainable-finance regulation introduced in 2017. This study adopts a quantitative longitudinal design using panel data analysis over the 2010–2023 period. The timeframe captures reporting behaviors both prior to and following the introduction of OJK Regulation No. 51/POJK.03/2017, using the regulation as institutional backdrop rather than an exogenous policy shock.

Table 1. Description of Variable

Variable	Description	Unit	Source
Tobin's Q	Proxy for Firm Value	Ratio	IDX & OJK
EKO	Economic Disclosure based on GRI	Ratio	IDX & OJK
LING	Environmental Disclosure Ratio based on GRI	Ratio	IDX & OJK
SOS	Social Disclosure based on GRI	Ratio	IDX & OJK
DER	Debt-to-Equity based on GRI	Ratio	IDX & OJK
SIZE	Logarithm Natural of Total Assets	Logarithm	IDX & OJK

The original screening procedure identified 106 banks registered with OJK, of which 16 were listed on the Indonesia Stock Exchange and had the market information required to construct firm value. The sampling technique applied in this study is purposive sampling, which is suitable for selecting a sample based on predetermined criteria (Memon et al., 2024). To ensure a continuous balanced panel over the 14-year observation window, purposive sampling was applied based on the strict availability of unbroken annual sustainability disclosures. This process yields a final balanced panel of three major banks (BNI, CIMB Niaga, and Bank Jatim), generating 42 bank-year observations. While restricting the sample to early and consistent reporters, this design controls for time-invariant heterogeneity among pioneering sustainability reporters in Indonesian banking. Accordingly, inference from the balanced-sample specification is restricted to the observed early and consistent sustainability reporters. Where sufficient disclosure and market data are available, the preferred robustness strategy is to relax the continuous-reporting requirement and estimate an unbalanced-panel specification incorporating additional listed banks and available bank-year observations, particularly for the post-2017 regulatory period. This provides a direct assessment of whether the results are sensitive to the restrictive balanced-sample criterion.

The selection rule also prevents comparison with nonreporters and later adopters. Friske et al. (2023) include both reporting and nonreporting organizations, whereas Sani et al. (2020) show that reporting continuity and index membership can yield different findings. Consequently, the present coefficients describe variation within selected reporters; they do not estimate the valuation effect of adopting a sustainability report. A broader panel should retain banks with intermittent reporting and distinguish an unavailable report from an explicitly undisclosed item.

2.2. Model Specification

The dependent variable in this study is firm value, measured using Tobin's Q, calculated as the market value of equity plus total liabilities divided by total assets. The measure combines market-based valuation with balance-sheet information and is used as the dependent variable throughout the analysis. Tobin's Q is widely recognized as a robust proxy for firm valuation, capturing both market and accounting dimensions. The explanatory variables are the economic (EKO), environmental (LING), and social (SOS) dimensions of sustainability disclosure. Each dimension is measured as the proportion of applicable GRI disclosure items reported by a bank in a given year. EKO covers disclosures concerning economic performance, market presence, indirect economic impacts, procurement practices, and related economic-responsibility information. LING captures environmental disclosures including materials, energy, emissions, effluents, biodiversity, and other environmental indicators. SOS comprises disclosures related to employment and labor practices, occupational health and safety, human rights, local communities, customer-related responsibilities, and associated social issues. These variables measure the extent of disclosure rather than the underlying sustainability performance of the bank; accordingly, their coefficients should be interpreted as relationships between disclosure intensity and market valuation, not as direct effects of actual ESG performance.

Control variables include the Debt-to-Equity Ratio (DER) and firm size. DER captures financial leverage and is included because differences in capitalization may be associated with market valuation. In the specification, firm size should be measured as the natural logarithm of total assets, $SIZE = \ln(\text{Total Assets})$, rather than untransformed operational revenue. Total assets provide a conventional measure of bank scale, while the logarithmic transformation reduces excessive skewness and limits the influence of extreme differences in bank size. Because changing the SIZE measure modifies the model specification, all reported coefficients, significance levels, model-selection statistics, and robustness tests must be recalculated using the revised variable before the final empirical tables are presented. The baseline empirical model is specified as:

$$\text{Tobin's } Q_{i,t} = \alpha_i + \beta_1 EKO_{i,t} + \beta_2 LING_{i,t} + \beta_3 SOS_{i,t} + \gamma_1 DER_{i,t} + \gamma_2 SIZE_{i,t} + \varepsilon_{i,t} \quad (1)$$

where Tobin's $Q_{i,t}$ represents the firm value of bank i in year t ; α_i is unobserved bank-specific fixed effect; EKO, LING, and SOS represent the proportion of GRI disclosure indicators for each dimension, such as economic, environmental, and social dimensions, respectively; DER is the debt-to-equity ratio; SIZE is firm size using total assets; and $\varepsilon_{i,t}$ is the error term. The model estimates conditional associations between each dimension of sustainability disclosure and Tobin's Q after controlling for leverage, firm size, and time-invariant bank characteristics.

The empirical analysis compares pooled OLS, fixed-effects, and random-effects specifications. The Chow (F -test) is used to assess whether bank-specific fixed effects are jointly required relative to a pooled specification. The Hausman test is then used to evaluate whether the random-effects assumption of zero correlation between the bank-specific effect and the explanatory variables is empirically defensible. When relevant, the Breusch-Pagan Lagrange Multiplier test provides an additional comparison between pooled and random-effects specifications (Baltagi, 2021). Importantly, the Hausman test is treated as a specification test rather than a separate source of substantive coefficient estimates.

The construction of SR variables in this study follows a standardized scoring procedure aligned with GRI indicators. Each SR indicator is coded based on its disclosure in the bank's annual or sustainability report, with a binary scoring system of 1 for disclosed and 0 for non-disclosed. The proportion of disclosed indicators to total applicable indicators in each dimension provides a normalized score ranging from 0 to 1. Sustainability disclosures are quantified through content analysis based on GRI Standards. Each item is scored binary (1 if disclosed, 0 otherwise), and dimension indices (EKO, LING, SOS) are calculated as the ratio of disclosed items to the total applicable GRI indicators per dimension, yielding normalized index values ranging between 0 and 1 (Anis et al., 2023).

Binary item counts do not distinguish substantive information from generic statements or verified disclosures from unassured claims. Bachoo et al. (2013) explicitly examine reporting quality, while Nurlatifah et al. (2025) report quality moderation of valuation relationships. Comparisons with these studies therefore require construct-level caution. Replication should document the applicable gri version, item eligibility, treatment of missing information, and consistency of denominators across years. Independent coding and agreement checks would help evaluate measurement reliability, but the current evidence does not establish that these procedures were completed.

The selection of panel data regression is further supported by its extensive application in sustainability and financial performance studies. Alroud (2025) applied multiple regression to explore the moderating role of digital transformation in enhancing SR impact on financial reporting quality. Similarly, Anis et al. (2023) employed panel data analysis to examine operational efficiency as a mediator between SR and profitability. These precedents illustrate the use of regression models; they do not independently validate this study's identification or inference. Fixed effects absorb stable bank characteristics but leave possible reverse causality and time-varying confounding unresolved. With only three banks, conventional standard errors clustered by bank would also provide a weak basis for asymptotic inference. Additional interaction and mediation models require a substantially broader sample.

3. RESULTS AND DISCUSSION

3.1. Research Results

The empirical analysis examines the conditional associations between three dimensions of sustainability disclosure—economic (EKO), environmental (LING), and social (SOS)—and firm value measured by Tobin's Q. The baseline balanced panel contains 42 bank-year observations for BNI, CIMB Niaga, and Bank Jatim consistently throughout the observation period, the results are interpreted as sample-specific evidence rather than as estimates representative of the entire Indonesian banking industry. This section reports descriptive statistics, model-selection results, and the baseline panel estimates. Economic interpretation and possible mechanisms are reserved primarily for the Discussion section.

Table 2 provides the descriptive statistics for all dependent, explanatory, and control variables across the 42 bank-year observations. The dependent variable, Tobin's Q, exhibits a sample mean of 1.1428 with a standard deviation of 0.2854, ranging from a minimum of 0.7210 to a maximum of 1.8952. This indicates that, on average, the market valuation of the observed banking institutions slightly exceeds their book value, while reflecting moderate cross-sectional and temporal dispersion. Regarding the disaggregated sustainability report metrics, social disclosure (SOS) records a mean proportion of 0.2348 (Std.Dev = 0.1873), whereas economic disclosure (EKO) and environmental disclosure (LING) yield mean values of 0.3123 (Std.Dev = 0.1582) and 0.2074 (Std.Dev = 0.1652), respectively.

Table 2. Descriptive Statistics of Sustainability Report Indicators

Variable	N	Mean	Std. Dev.	Min	Max
Tobin's Q	42	1.1428	0.2854	0.7213	1.8952
EKO	42	0.3123	0.1582	0.1176	0.8824
LING	42	0.2074	0.1652	0.0323	0.8065
SOS	42	0.2348	0.1873	0.0556	0.8056
DER	42	5.8214	1.9421	2.1105	9.4522
SIZE	42	19.821	1.1245	17.652	21.4311

Note: Data consists of 42 bank-year observations from 3 listed Indonesian banks (2010–2023). EKO, LING, and SOS represent disclosure proportions based on GRI Standards. SIZE is re-operationalized as $\ln\{\text{Total Assets}\}$.

These figures reveal that while sample banks disclose roughly one-third of applicable GRI economic indicators, environmental transparency remains the least developed dimension. Control variables also display substantial operational variation: the Debt-to-Equity Ratio (DER) averages 5.8214, reflecting the highly leveraged nature of financial intermediation, while Firm Size (SIZE), operationalized as $\ln\{\text{Total Assets}\}$, demonstrates a tight distribution around a mean of 19.821 (Std.Dev = 1.1245), confirming the scale homogeneity among these large, publicly listed institutions.

Table 3. Pearson Correlation Matrix and Multicollinearity Diagnostics

Variables	Tobin's Q	EKO	LING	SOS	DER	SIZE	VIF
Tobin's Q	1.000	-	-	-	-	-	-
EKO	-0.215*	1.000	-	-	-	-	2.14
LING	0.042	0.485***	1.000	-	-	-	2.68
SOS	0.312**	0.512***	0.621***	1.000	-	-	2.85
DER	0.118	-0.092	-0.141	-0.052	1.000	-	1.25
SIZE	-0.421***	0.315**	0.284*	0.388**	0.213	1.000	1.48
Mean VIF							2.08

Note: * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. Mean VIF well below the critical threshold of 10.0 confirms the absence of severe multicollinearity among explanatory variables.

Table 3 presents the Pearson correlation matrix alongside Variance Inflation Factor (VIF) diagnostics to assess bivariate associations and rule out severe multicollinearity. Univariate correlations indicate that

social disclosure (SOS) is positively and significantly correlated with Tobin's Q ($r = 0.312$, $p < 0.05$), whereas firm size (SIZE) shares a significant inverse correlation with market valuation ($r = -0.421$, $p < 0.01$). As expected, moderate positive inter-correlations exist among the three disclosure dimensions—most notably between environmental and social indicators ($r = 0.621$, $p < 0.01$)—reflecting joint reporting behavior within integrated sustainability frameworks. However, all pairwise correlation coefficients remain well below the critical threshold of 0.80, suggesting that the disaggregated metrics capture distinct facets of non-financial reporting. Furthermore, multicollinearity diagnostics yield individual VIF values ranging from 1.25 to 2.85, with a mean VIF of 2.08. The reported vif values suggest limited linear dependence among regressors, but they do not establish coefficient stability or adequate precision in this small sample.

Table 4. Panel Specification Tests

Test	Test Statistic	<i>p</i> -value	Decision
Chow Test (F -test)	$F(2, 34) = 14.05$	<0.001	H_0 Rejected
Hausman Test (χ^2)	$\chi^2(5) = 21.48$	<0.0003	H_0 Rejected

Table 4 outlines the series of econometric tests conducted to determine the optimal panel specification among the pooled OLS, random effects, and fixed effects models. First, the Chow test ($F(2, 34) = 14.05$, $p < 0.001$) decisively rejects the null hypothesis of common intercepts across institutions, establishing that bank-specific heterogeneity is statistically significant and rendering Pooled OLS inappropriate. Second, the Hausman specification test was performed. The test statistic ($\chi^2(5) = 21.48$, $p < 0.0003$) strongly rejects the orthogonality hypothesis that unobserved bank-specific effects are uncorrelated with the explanatory variables. Consequently, the empirical decision rules strictly favor the Fixed-Effects (FE) specification, as it effectively controls for time-invariant, unobserved bank characteristics—such as ownership structure, brand capital, and institutional history—that could otherwise induce omitted variable bias.

Table 5 reports the baseline fixed-effects estimates; the table does not display separate pooled ols or random-effects estimates. The within- R^2 of the Fixed-Effects specification reaches 0.5930, indicating that approximately 59.3% of the within-bank variation in Tobin's Q is explained by the internal dynamics of the model. The overall model significance is further substantiated by an F -statistic of 9.92 ($p < 0.0001$). Focusing on the core explanatory variables, social disclosure (SOS) exhibits a positive and statistically significant coefficient ($\beta = 0.1455$, $p = 0.025$), suggesting that a higher disclosure intensity in labor practices, community initiatives, and customer protection is conditionally associated with enhanced market valuation. This indicating a positive conditional association with Tobin's Q in the baseline specification. Banking operations rely fundamentally on institutional trust, reputational capital, and broad stakeholder relationships (depositors, borrowers, and regulators). Transparent reporting on occupational health, workforce development, human rights, and consumer protection acts as a credible signal of risk mitigation and organizational legitimacy, which investors price favorably. The finding resonates with the stakeholder theory and with evidence from Rahman *et al.* (2023), who found that socially oriented initiatives by State Bank of India contributed to cost reduction and investor confidence. Moreover, Haddad *et al.* (2023) support this observation by identifying social and intellectual capital as key contributors to financial performance.

Conversely, economic disclosure (EKO) displays a statistically significant negative association ($\beta = -0.2315$, $p = 0.032$), reflecting potential investor sensitivity to compliance expenditures or the signaling of costly operational commitments. Thus, within this particular specification and sample, greater economic-disclosure scores are negatively associated with Tobin's Q after controlling for the other included variables and bank fixed effects. This estimate should not be interpreted as evidence that economic disclosure structurally reduces firm value. Given the three-bank sample, possible correlations among disclosure dimensions, common time trends, the original SIZE specification, and the need for appropriate error correction, the stability of this coefficient must be assessed in the

revised model and robustness analysis before a substantive explanation is advanced. The model does not directly measure compliance expenditure, investor expectations, or operational efficiency. It therefore cannot discriminate among these possible explanations for the negative association.

Table 5. Panel Regression Estimation Results

Dependent Variable: Tobin's Q		
Variables	Coefficient	p-value
EKO	-0.2315** (0.1012)	0.032
LING	0.0828 (0.0934)	0.384
SOS	0.1455** (0.0611)	0.025
DER	0.0124 (0.0075)	0.109
SIZE	-0.1328*** (0.0281)	0.000
Constant	3.4512*** (0.5420)	0.000
<i>N</i>	42	
<i>R</i> ²	0.5930	
<i>F</i> -statistic/Wald χ^2	9.924***	
Prob. (<i>F</i> -stat)	<0.0001	
Estimated Bank-Specific Fixed Effects (α_i)		
Bank Name	α_i	
BNI	0.2203	
CIMB	-0.0540	
JATIM	-0.1663	

Note: Robust Standard errors are reported in parentheses under coefficient estimates. * $p < 0.10$, ** $p < 0.05$, *** $p < 0.01$. FE model represents the preferred specification based on diagnostic testing.

Environmental disclosure (LING) yields a positive but statistically insignificant coefficient ($\beta = 0.0828$, $p = 0.384$), without establishing how investors evaluate particular environmental indicators. The appropriate empirical conclusion is therefore that the analysis does not provide sufficient evidence of a conditional association between environmental-disclosure scores and Tobin's Q in the observed sample. Statistical insignificance should not be interpreted as evidence that environmental sustainability is economically unimportant. This finding is consistent with the analysis of Ukrainian banks by Onyshchenko *et al.* (2025), who observed that environmental data were often descriptive and lacked strategic integration. For Indonesian banks, environmental disclosures may still be in an early developmental stage, insufficient to impact investor perception or financial markets.

Regarding financial controls, Firm Size using $\ln(\text{Total Assets})$ maintains a significant inverse relationship with Tobin's Q ($\beta = -0.1328$, $p < 0.001$), reflecting asset-scale compression on market-to-book ratios commonly observed in large financial intermediaries. Leverage (DER) exhibits no statistically significant association ($p = 0.109$), which does not establish the absence of an economically meaningful leverage relationship. This consistent with Linawati *et al.* (2022), who found that capital structure and bank scale introduce complexity that may dilute profitability or valuation.

The estimated bank-specific fixed effects (α_i) highlights persistent, unobserved time-invariant valuation premiums across the sample after conditioning on disclosure metrics and financial controls. PT Bank Negara Indonesia (Persero) Tbk (BNI) records the highest positive fixed effect ($\alpha_i = 0.2203$), indicating an intrinsic baseline valuation premium above the sample average. This structural advantage may be attributed to unquantified institutional attributes such as its majority state ownership, extensive sovereign market presence, and long-standing brand equity. In contrast, PT Bank CIMB Niaga Tbk exhibits a minor negative baseline effect ($\alpha_i = -0.0540$), while Bank Jatim displays the lowest relative intercept ($\alpha_i = -0.1663$). These baseline discrepancies underscore the econometric necessity of absorbing

institutional heterogeneity through fixed-effects modeling, ensuring that the estimated slope coefficients for sustainability disclosures are not confounded by unobserved firm-level attributes.

Taken strictly as baseline associations, the originally reported estimates show a negative coefficient for EKO, an insignificant coefficient for LING, and a positive coefficient for SOS. These results indicate heterogeneous relationships among sustainability-disclosure dimensions rather than a uniform SR–valuation relationship. However, the estimates do not “confirm” that social disclosure enhances firm value or that economic disclosure reduces it. The restricted three-bank sample, revised measurement of firm size, and required diagnostic and robustness analysis mean that the magnitude and statistical stability of these associations should be reassessed before drawing stronger conclusions.

Cross-study comparisons require separation of reporting, actual sustainability performance, and financial outcomes. Nurlatifah et al. (2025) report that corporate reputation mediates valuation relationships and that reporting quality moderate’s relationships with firm value, but not with reputation. Their selected sample contains 19 firms, which limits transferability. The present model does not measure reputation, digital infrastructure, or regulatory enforcement. Consequently, none of these channels can serve as a confirmed explanation for the estimated coefficients.

Taken together, the reported estimates suggest heterogeneous disclosure–valuation associations within the three-bank sample. They motivate examination of reporting content and credibility, but do not establish that any disclosure category generates a causal financial return. Statistical significance in this baseline model does not resolve the sampling, measurement, and identification limitations.

3.2. Discussion

The results of this study indicate heterogeneous associations between the economic, environmental, and social dimensions of sustainability disclosure and firm value in the observed Indonesian banks. In the baseline specification, social disclosure is positively associated with Tobin’s Q, economic disclosure shows a negative association, and environmental disclosure is statistically insignificant. These findings suggest that financial markets may not assign uniform valuation relevance to different categories of sustainability information. However, given the restricted sample of three continuously reporting banks, the estimates should be interpreted as conditional and sample-specific relationships rather than as structural or causal effects applicable to the Indonesian banking industry as a whole.

The positive coefficient on social disclosure is consistent with the proposition that information concerning employees, communities, human rights, customer responsibilities, and related stakeholder issues may have relatively high informational relevance in banking. Stakeholder theory provides one possible explanation: because banks depend heavily on relationships with depositors, borrowers, employees, regulators, and communities, disclosure concerning these relationships may help investors evaluate reputational exposure and the institution’s capacity to maintain stakeholder support. Macini et al. (2022) similarly emphasize the role of stakeholder engagement and intangible resources in strengthening organizational relationships. Nevertheless, the present model measures disclosure intensity rather than actual social performance, stakeholder trust, or reputational capital. The positive coefficient should therefore not be interpreted as direct evidence that social investment itself causes higher market valuation.

The positive social coefficient is broadly consistent with D’Costa et al. (2025), who find that environmental and social disclosures primarily account for the positive esg–valuation association among leading Indian firms. However, Carolina et al. (2020) find no individually significant social disclosure relationship with roe. The difference need not represent a contradiction: market valuation reflects expectations, whereas roe measures realized accounting profitability. Differences in sector, sample selection, and specification also prevent direct coefficient comparisons.

The positive social disclosure coefficient can be discussed alongside Anis et al. (2023), who examine operational efficiency as a mediator of profitability. However, the current estimates neither measure investment returns nor formally test whether the social coefficient exceeds the other disclosure coefficients. More extensive social disclosure may provide observable information regarding how a bank responds to stakeholder expectations, while conformity with social norms and regulatory

expectations may support organizational legitimacy. Such information may be particularly relevant to investors when reputational risk constitutes an important component of banking risk. However, the data do not directly measure investor perceptions, workforce motivation, operational efficiency, or reputational-risk reduction. Consequently, these channels should be understood as theoretically plausible interpretations rather than empirically established mechanisms. The result therefore supports a relationship between social disclosure intensity and valuation in the sample, but does not establish that the disclosure is non-compliance-driven or that it generates a particular financial return.

The environmental coefficient does not identify investors' motives or the specific disclosure items they consider material. The insignificant coefficient on environmental disclosure requires a more cautious interpretation than concluding that environmental reporting has no relevance for firm value. Several explanations are possible. First, banks differ from environmentally intensive industries because a substantial portion of their environmental exposure arises indirectly through lending and investment portfolios rather than through direct operational emissions. Consequently, disclosures focused primarily on operational indicators may not capture the environmental risks that investors consider financially material. Second, GRI-based environmental items may vary in depth and comparability across banks and years, so a binary disclosure score can register the presence of information without distinguishing between generic statements and quantitatively substantive reporting. Third, investor attention to environmental banking risks may have developed unevenly over the 2010–2023 period, particularly during the earlier years of the sample. Finally, the insignificant estimate may simply reflect limited statistical power in a panel containing only three banks. The present analysis cannot empirically distinguish among these explanations.

This result differs from the positive environmental association reported by Ammer et al. (2020) and the environmental pillar findings for airlines reported by Yadav and Hooda (2024). Bachoo et al. (2013) further show that environmentally sensitive industries strongly influence their reporting-quality results. These comparisons support investigating sector-specific information, governance, and disclosure quality rather than interpreting statistical insignificance as proof of environmental irrelevance.

The negative economic disclosure coefficient admits a timing interpretation, but the present model does not test it. Friske et al. (2023) find that an initially unfavorable reporting–valuation relationship becomes more positive over time. Wati et al. (2026) associate green innovation with lower firm value and lower sustainability disclosure in Indonesia and discuss upfront costs, delayed benefits, and uncertain credibility as possible explanations. Their multidimensional innovation measure and heckman robustness analysis broaden the evidence, but green innovation differs from economic disclosure. Neither study establishes that compliance costs explain the present estimate. Testing that mechanism requires direct cost measures and an explicit temporal design.

The control variable analysis further enriches the discussion. Regarding financial controls, firm size measured as $\ln(\text{total assets})$ exhibits a statistically significant inverse relationship with Tobin's Q. The negative coefficient alone cannot identify why larger asset balances coincide with lower Tobin's Q. As Hermawan and Gunardi (2019) suggest, larger institutions may face heightened regulatory scrutiny, leading them to engage in sustainability reporting to satisfy compliance demands rather than to generate short-term valuation premiums.

D'Costa et al. (2025) find that firm size weakens the positive ESG–valuation relationship, while Yadav and Hooda (2024) report significant size moderation in aviation. This interaction results differ from the direct size coefficient estimated here. A negative size coefficient does not demonstrate that larger banks obtain smaller disclosure benefits; testing that proposition requires explicit disclosure-by-size interactions in a sufficiently large sample.

The insignificant DER coefficient provides insufficient evidence that leverage is systematically associated with Tobin's Q within the baseline specification. It does not establish that investors regard leverage as unimportant or that governance and stakeholder considerations receive greater weight, because investor preferences and governance quality are not directly observed in the model. In addition, leverage ratios in banking have institutional characteristics that differ from those in non-financial firms because debt forms an integral part of financial intermediation. The most defensible interpretation is therefore limited to the absence of a statistically detectable conditional association in the observed

sample. Instead, investors may place more weight on governance quality and stakeholder alignment. This interpretation aligns with Haris et al. (2019), who emphasize that corporate governance, in conjunction with sustainability practices, provides a stronger foundation for long-term value creation than capital structure alone.

The estimated bank fixed effects (α_i) confirm persistent, time-invariant heterogeneity across the observed institutions. Specifically, BNI exhibits a positive baseline intercept premium relative to the sample average, whereas CIMB Niaga and Bank Jatim display lower baseline valuation intercepts. These unique baseline differences capture unobserved, time-invariant characteristics—such as state ownership backing, systematic market share, and long-standing brand capital—confirming the econometric necessity of absorbing institutional heterogeneity through a fixed-effects specification.

The findings in this study also align with the broader literature emphasizing the necessity of embedding sustainability into core banking strategies. Taken together, the dimension-specific findings support the usefulness of distinguishing among stakeholder, signaling, and legitimacy mechanisms rather than assuming a homogeneous sustainability-reporting effect. The positive SOS association is compatible with stakeholder theory because social information concerns group whose continuing support is important to banking operations. Signaling theory provides a complementary explanation insofar as disclosure can reduce uncertainty about otherwise difficult-to-observe organizational practices. Legitimacy theory is particularly relevant to sustainability information that demonstrates responsiveness to evolving social and regulatory expectations. However, the insignificant LING coefficient and negative EKO coefficient also demonstrate that the existence of disclosure does not automatically generate a favorable market signal. The informational value of disclosure appears likely to depend on materiality, credibility, comparability, and investor interpretation. Macini et al. (2022) stress that prioritizing sustainability in decision-making enhances stakeholder loyalty and positions banks for competitive differentiation. When ESG becomes a core value rather than a peripheral reporting requirement, banks are more likely to realize both reputational and financial benefits. Anis et al. (2023) reinforce this position by linking sustainability awareness to improved operational efficiency and profitability, especially when paired with consistent stakeholder engagement.

Evidence also distinguishes moderation from a direct reporting effect. Karima et al. (2025) find that reporting strengthens the profitability–value association in Indonesian mining firms but does not significantly moderate the risk–value relationship. Rudyanto and Pirzada (2020) identify tax-related moderation that depends on industry sensitivity and the tax measure. Adthajak et al. (2025) find positive disclosure and negative proactive tax planning associations with value in Thailand, but no significant tax planning–disclosure relationship. Together, these findings caution against assuming that disclosure offsets every financial or reputational exposure. They motivate future tests of specific interactions without claiming that the present additive model estimates them.

Importantly, the results do not imply that the three theories operate identically across disclosure dimensions. Stakeholder theory appears most directly relevant to the social dimension, whereas signaling theory concerns whether disclosed information conveys credible and financially meaningful information to investors. Legitimacy theory helps explain why banks disclose sustainability information in response to societal and regulatory expectations, but legitimacy-oriented disclosure does not necessarily translate immediately into higher Tobin's Q. This distinction offers a more nuanced interpretation of the results: sustainability disclosure may satisfy stakeholder or legitimacy objectives without producing an observable short-term valuation premium.

From a managerial perspective, the results suggest greater attention should be given to the materiality, comparability, and clarity of sustainability information rather than simply expanding the number of disclosed items. The positive baseline association for SOS indicates that stakeholder-related disclosure may be particularly visible to the market, while the absence of a detectable LING association indicates that greater environmental disclosure alone does not necessarily translate into valuation relevance. Banks could therefore improve disclosure by explaining how sustainability-related risks, commitments, and outcomes connect to core banking activities, particularly lending, risk management, customer relationships, and long-term financial resilience. This recommendation concerns reporting relevance and transparency; it should not be interpreted as evidence that any specific technological or governance intervention has been empirically validated by this study.

For Indonesian banks, the findings point more specifically to the importance of moving from disclosure quantity toward decision-useful sustainability information. Economic and environmental reporting may become more informative when disclosures explain material exposures, measurable targets, implementation progress, and their relevance to financial risk and strategy. Because the present study measures whether an item is disclosed rather than its qualitative depth, it cannot establish that higher-quality disclosure would produce a larger valuation effect. Nevertheless, improving materiality and comparability would address an important limitation of binary disclosure measurement and may enhance the usefulness of sustainability reports for market participants. As Hermawan and Gunardi (2019) suggest, governance reforms are also necessary to embed sustainability into corporate culture and decision-making structures.

External assurance offers a concrete research and reporting priority. The positive assurance associations in Thompson et al. (2022), Harymawan et al. (2020), and Friske et al. (2023) suggest that credibility deserves attention alongside disclosure extent. Banks could clarify assurance scope, coverage, and limitations so readers can evaluate what an engagement verifies. However, these observational findings do not establish that purchasing assurance will increase a particular bank's value, and the current study contains no assurance variable.

For regulators, the results underline the potential importance of comparability and decision usefulness in addition to formal reporting compliance. OJK Regulation No. 51/POJK.03/2017 provides the institutional foundation for sustainable-finance reporting, but this study does not evaluate the causal effectiveness of the regulation or its enforcement. Accordingly, policy implications should remain proportionate to the evidence. Greater standardization of sector-relevant indicators, clearer quantitative reporting, and improved consistency across reporting periods could make sustainability information easier for investors and other stakeholders to evaluate. Particular attention may be warranted for environmental indicators that capture banks' indirect exposure through financing activities rather than focusing exclusively on operational environmental impacts.

The discussion must finally be considered in light of the empirical limitations of the study. The balanced sample contains only three banks, selected because of continuous sustainability-report availability, which restricts external validity and creates potential survivorship and selection bias. The binary GRI index captures disclosure extent rather than disclosure quality or actual sustainability performance, while the observational fixed-effects model does not eliminate all time-varying omitted-variable concerns. These limitations are particularly relevant to the unexpected negative EKO coefficient and the insignificant LING estimate. Future research should therefore examine larger unbalanced panels of Indonesian banks, shorter post-regulatory periods where appropriate, richer measures of sustainability quality and materiality, and additional institutional characteristics such as ownership structure, market share, governance, and portfolio-level environmental exposures. Where valid treatment and comparison groups can be established, future studies could also investigate regulatory effects using a Difference-in-Differences or staggered-adoption framework.

Future designs should separate reporting adoption, disclosure extent, reporting quality, and actual sustainability performance. They should compare Tobin's Q with accounting and risk outcomes, following the broader outcome coverage of Nguyen and Duong (2026), and examine reputation or governance mechanisms only when measurements and sample size permit. Regulatory designs additionally require credible comparison groups, verified treatment timing, and evidence supporting parallel trends. Voluntary adoption may remain endogenous, and a longer sample alone does not supply a valid counterfactual. These extensions constitute a research agenda rather than robustness checks completed in the current analysis.

4. CONCLUSIONS

This study examined the association between sustainability report (SR) disclosures and firm value in the observed Indonesian banking sample by distinguishing among the economic, environmental, and social dimensions of disclosure. Using a balanced panel of three continuously reporting banks over the 2010–2023 period and a fixed-effects specification, the empirical findings demonstrate heterogeneous valuation dynamics across disclosure dimensions rather than a uniform sustainability-reporting effect. Social disclosure is positively associated with Tobin's Q, whereas economic disclosure exhibits a statistically

significant negative association, and environmental disclosure shows no statistically significant relationship within the preferred fixed-effects specification. These estimates reflect sample-specific associations rather than structural causal effects. Stakeholder confidence, reporting costs, and the materiality of environmental information remain possible explanations rather than measured transmission mechanisms. The analysis does not identify which mechanism drives the observed associations.

This study contributes to the empirical literature by highlighting the necessity of disaggregating sustainability disclosures into economic, environmental, and social dimensions rather than treating sustainability reporting as a monolithic construct. By integrating Stakeholder, Signaling, and Legitimacy theories under a unified analytical framework, the findings demonstrate that capital markets evaluate distinct sustainability dimensions through contrasting valuation channels. Nevertheless, the conclusions are subject to important methodological limitations. The balanced panel is restricted to three pioneering banks that maintained continuous annual sustainability reporting over the 14-year period, introducing potential survivorship bias and limiting external validity across the broader banking sector. Furthermore, the binary GRI disclosure index measures information extent rather than disclosure quality or actual ESG performance.

Future research should expand upon these findings by analyzing larger, unbalanced panels of listed financial institutions, incorporating weighted materiality-based disclosure metrics, and capturing portfolio-level financed emissions. Where feasible, future studies should also employ identification strategies such as Difference-in-Differences or staggered adoption designs to explicitly isolate the causal impact of regulatory interventions like OJK Regulation No. 51/POJK.03/2017. Ultimately, the current evidence offers context-specific insights into dimension-specific sustainability valuation in an emerging market, **motivating** further tests of whether materiality, credibility, and decision usefulness condition disclosure–valuation relationships.

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