AL-ARBAH: Journal of Islamic Finance and Banking
Vol. 8 No. 2 (2026), 371-398; DOI: 10.21580/al-arbah.2026.8.2.31635
E-ISSN: 2716-2575, P-ISSN: 2716-3946

Sustainability Practices and Profitability of Islamic Commercial Banks in Indonesia

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Received
15 March 2026
Revised
4 May 2026
7 June 2026
Accepted
17 June 2026

Abstract

Purpose - This study aims to examine the influence of green banking practices, banking zakat, and Corporate Social Responsibility (CSR) disclosures on the Return on Assets (ROA) of Islamic Commercial Banks (Bank Umum Syariah/BUS) in Indonesia during the 2021–2024 period.

Method - A quantitative approach is employed using secondary data collected through documentation methods, encompassing sustainability reports, annual reports, and audited financial statements published by each sampled Islamic Commercial Bank. Panel data regression analysis was performed using EViews 12, with model selection guided by the Chow test, Hausman test, and Lagrange Multiplier test.

Result - Green banking and Corporate Social Responsibility (CSR) do not exert a statistically significant influence on ROA. In contrast, banking zakat demonstrates a positive and significant effect on ROA. Jointly, the three independent variables do not significantly explain variation in ROA, as indicated by the relatively low coefficient of determination (R^2 = 17.82%).

Implication - The findings offer practical insight for Islamic banking managers and regulators regarding the limited short-term financial impact of green banking and CSR initiatives, while underscoring the strategic value of zakat management as a profitability-enhancing instrument.

Originality - This study contributes to the literature by simultaneously testing green banking, banking zakat, and CSR against Islamic Commercial Bank profitability over the most recent available period (2021–2024), revealing a differentiated impact structure in which only banking zakat yields a significant positive effect on ROA.

Keywords: Green Banking, Banking Zakat, Corporate Social Responsibility, Return on Assets, Islamic Commercial Banks, Triple Bottom Line; ESG, Panel Data

Introduction

Financial performance is widely recognized as a key indicator of a bank's long-term sustainability, competitiveness, and regulatory legitimacy. In Islamic commercial banking, profitability reflects not only managerial efficiency and operational effectiveness but also adherence to Shari'ah principles and institutional credibility, both of which contribute to regulatory legitimacy under OJK oversight. Profitability, in particular, determines a bank's capacity to generate returns from its core intermediation activities, attract investors, and maintain long-term viability. In the modern financial reporting landscape, profitability is measured predominantly through the Return on Assets (ROA) ratio, which captures how effectively a bank converts its total asset base into net earnings before tax (Prasetyo, 2015; Lukitasari & Kartika, 2014).

In Indonesia, Bank Indonesia Circular Letter No. 13/24/DPNP/2011 establishes a minimum ROA benchmark of 1.5% for the banking sector. Based on Financial Services Authority (OJK) data, the cumulative net profit of the Indonesian Islamic banking industry reached IDR 10.64 trillion as of September 2024, with Islamic Commercial Banks (BUS) contributing the largest share of IDR 7.13 trillion (Fajarihza, 2024). Although aggregate profitability has trended positively, individual bank performance varies substantially, warranting closer examination of the non-financial determinants that may drive these divergences.

Beyond conventional financial variables, the growing integration of environmental, social, and governance (ESG) principles into banking strategy has prompted scholars and practitioners alike to question whether sustainability-oriented initiatives translate into measurable financial outcomes. Three such non-financial dimensions are particularly salient in the context of Islamic Commercial Banks: green banking, banking zakat, and Corporate Social Responsibility (CSR).

Green banking refers to business practices that prioritize environmental stewardship through eco-friendly operations, green financing, energy efficiency programs, and sustainability reporting. Grounded in Stakeholder

Theory (Freeman, 1984) and Legitimacy Theory (Suchman, 1995), green banking signals a bank's commitment to environmental stakeholders and serves as a mechanism for maintaining social license to operate. While green banking is theoretically expected to enhance a bank's reputation and attract environmentally conscious clients, its impact on short-term profitability is ambiguous, given the upfront investment costs associated with digital transformation and clean operations.

Banking zakat, a distinctive feature of the Islamic financial system, represents a bank's mandatory charitable contribution on its net wealth or profit in accordance with Shari'ah principles. Beyond its spiritual and social dimensions, banking zakat may strengthen a bank's institutional image, foster customer loyalty, and consequently contribute to profitability. Several prior studies have documented a positive relationship between zakat disbursement and Islamic bank financial performance (Rhamadhani, 2017; Wardiwiyono & Jayanti, 2021; Anggraeni & Gultom, 2024; Nabillah & Oktaviana, 2022).

Corporate Social Responsibility (CSR) encompasses a bank's commitment to sustainable economic development through social and environmental programs. Although CSR is institutionally mandated under Law No. 40 of 2007 on Limited Liability Companies, empirical evidence on its financial impact remains inconclusive. Among studies focused on Indonesian Islamic Commercial Banks, some report positive effects (Pratiwi et al., 2021) and others finding negative or insignificant relationships (Faradiz et al., 2023; Mais et al., 2023; Baarsyah & Welkom, 2025).

The mixed findings reported in prior studies indicate a persistent gap in the empirical literature. While existing research has examined the relationship between green banking, banking zakat, CSR, and bank performance, few studies have investigated these variables simultaneously in the context of Islamic commercial banks (BUS). Moreover, to the best of the authors' knowledge, no study has employed panel data covering the post-pandemic period from 2021 to 2024. This study addresses that gap by adopting the Triple Bottom Line (TBL) theoretical framework (Elkington, 1998) and its ESG

operationalization as the basis for conceptualizing how these non-financial dimensions interact with bank profitability.

Table 1 presents the ROA data for all 14 registered Islamic Commercial Banks in Indonesia for the 2021–2024 period, illustrating the substantial heterogeneity in performance that this study seeks to explain.

Table 1. ROA of Islamic Commercial Banks in Indonesia, 2021–2024

No.	Bank Name	2021	2022	2023	2024
1	PT Bank Syariah Indonesia	1.61	1.98	2.35	2.49
2	PT BCA Syariah	1.10	1.30	1.50	1.60
3	PT Bank Muamalat Indonesia	0.02	0.09	0.02	0.03
4	PT Bank Victoria Syariah	0.71	0.45	0.64	0.82
5	PT Bank Mega Syariah	4.08	2.59	1.96	2.04
6	PT Bank Panin Dubai Syariah	−6.72	1.79	1.55	0.65
7	PT Bank KB Bukopin Syariah	−5.48	−1.27	−7.13	0.20
8	PT Bank BTPN Syariah	10.72	11.43	6.34	6.33
9	PT Bank Aladin Syariah	8.81	10.85	4.22	0.90
10	PT Bank Aceh Syariah	1.87	2.00	2.05	2.01
11	PT BPD Riau Kepri Syariah	–	–	1.33	1.43
12	PT BPD Nusa Tenggara Barat Syariah	1.64	1.93	2.07	1.85
13	PT Bank Jabar Banten Syariah	0.96	1.14	0.42	0.57
14	PT Bank Nano Syariah	–	–	–	–

Source: Annual Reports of Islamic Commercial Banks (2021–2024)

Data processed by the authors (2025)

Table 1 exposes a wide dispersion of ROA outcomes. At the upper end, PT Bank BTPN Syariah recorded ROA exceeding 10% in 2021 and 2022 before declining to approximately 6.3% in 2023–2024, partly reflecting sector-wide normalization of pandemic-era consumer credit spreads. PT Bank KB Bukopin Syariah presents the starkest case of financial distress, recording −5.48% and −7.13% in 2021 and 2023 respectively, before returning to a marginally positive position in 2024 following balance-sheet restructuring. Several mid-tier banks, including PT BCA Syariah and PT Bank Aceh Syariah, maintained

stable ROA within or near the OJK benchmark range throughout the period. PT Bank Nano Syariah was excluded from empirical analysis owing to its inaugural operational year in 2024. This heterogeneity motivates the search for non-financial determinants that may systematically differentiate bank performance beyond conventional financial ratios (Athanasoglou et al., 2008; Sufian & Habibullah, 2009).

Literature Review

Triple Bottom Line Theory and the ESG Framework

The Triple Bottom Line (TBL) framework, introduced and elaborated by John Elkington in Partnerships from cannibals with forks: The triple bottom line of 21st-century business (1998), fundamentally reframes the purpose of corporate performance measurement. Elkington argues that sustainable value creation necessitates simultaneous achievement across three dimensions: economic profit, social equity (people), and environmental stewardship (planet). Applied to banking, TBL implies that profitability, social impact, and environmental responsibility are mutually reinforcing rather than competing objectives. The operational mechanism runs as follows: social and environmental investments generate reputational capital and institutional legitimacy, which in turn attract and retain depositors, expand the earning asset base, and ultimately improve return metrics such as ROA. The transmission pathway through which sustainability practices influence financial outcomes serves as the conceptual foundation for examining the relationships between green banking, zakat, CSR, and profitability in this study (Jeurissen, 2000).

The Environmental, Social, and Governance (ESG) framework operationalises TBL principles through measurable, externally verifiable indicators. The Environmental pillar captures a bank's ecological footprint, green financing portfolio, and climate risk management; the Social pillar encompasses labour practices, community investment, and financial inclusion; and the Governance pillar evaluates board accountability, transparency, and

Shari'ah compliance mechanisms (Rizki et al., 2024). Buallay (2019) provides cross-sector evidence that ESG disclosure levels are positively correlated with bank profitability and market valuation, reinforcing the hypothesis that sustainability is financially material over the medium term. Mirroring this, Friede et al. (2015) demonstrate in their meta-analysis that ESG factors exhibit a predominantly positive relationship with financial performance across global datasets.

Within Islamic banking, the principles of the Triple Bottom Line (TBL) closely correspond to the *maqāṣid al-Sharīʿah*, the fundamental objectives of Islamic law, which emphasize the preservation of religion, life, intellect, lineage, and wealth through economic and social activities. The connection to profitability is direct: banks that credibly fulfil maqāṣid obligations through zakat, ethical financing, and environmental stewardship earn social legitimacy among Muslim stakeholders, translating into deeper customer loyalty and stronger ROA. Profitability thus signals the bank's holistic fulfilment of its Shari'ah mandate. Banking zakat, green financing, and community CSR programs are not merely regulatory obligations but expressions of these higher-order ethical commitments, lending TBL a distinctive normative grounding in Islamic finance (Haniffa & Hudaib, 2007).

Stakeholder Theory and Legitimacy Theory

Freeman's (1984) Stakeholder Theory, sustainable organizational value is generated through the effective management of relationships with diverse stakeholder groups, including shareholders, customers, employees, regulators, communities, and the natural environment, rather than through an exclusive focus on shareholder interests. For Islamic Commercial Banks, this stakeholder set is particularly broad: in addition to conventional banking stakeholders, BUS must satisfy the expectations of Shari'ah supervisory boards, Muslim depositors concerned with halal fund management, and zakat recipients. Wajdi Dusuki & Irwani Abdullah (2007) empirically demonstrate that Malaysian Islamic bank customers patronise institutions precisely because of their perceived commitment to social responsibility and Shari'ah principles, establishing a direct link between social practice and customer retention.

Legitimacy Theory (Suchman, 1995), which posits that organisations continuously align their actions with the prevailing norms and expectations of their institutional environment to maintain social acceptance, complements Stakeholder Theory in this framework. For Islamic Commercial Banks, green banking adoption, zakat disbursement, and CSR disclosure can be understood as observable signals of Shari'ah alignment and societal accountability. These behaviours may reflect either genuine institutional commitment or, alternatively, symbolic compliance driven primarily by regulatory obligation. When the latter dominates, the legitimacy premium and any associated profitability benefit are likely to be attenuated (Scholtens, 2009). This distinction may account for the null results observed for CSR and green banking in the present study, where short-term cost pressures may have rendered these practices more compliance-oriented than strategically embedded.

Return on Assets (ROA)

ROA is the pre-eminent indicator of banking efficiency, capturing how productively a bank converts its total asset base into pre-tax earnings (Asmara & Nugraeni Nugraeni, 2024). Athanasoglou et al. (2008), in a landmark study of Greek commercial banks, identify internal determinants (capital strength, credit quality, expense management) and macroeconomic conditions (GDP growth, inflation) as the primary ROA drivers, establishing the foundational econometric structure for subsequent banking profitability research. Sufian & Habibullah (2009) extend this framework to Asian banks, confirming that bank-specific efficiency ratios dominate macroeconomic variables in explaining cross-sectional ROA variation. The present study incorporates this benchmark by acknowledging the primacy of conventional financial determinants while examining whether non-financial ESG factors provide incremental explanatory power.

Green Banking

Green banking is the integration of environmental sustainability principles into core banking strategy, encompassing eco-friendly lending criteria,

renewable energy financing, paperless transaction systems, carbon footprint reduction programs, and mandatory sustainability reporting (Mozib Lalon, 2015; Roy & Savarimuthu, 2021). Weber (2012) argues that environmental risk management, a key dimension of green banking, serves not only as a prudential risk-mitigation mechanism but also as a source of competitive advantage. By systematically incorporating environmental considerations into credit assessment and lending decisions, banks can reduce their exposure to non-performing loans and enhance financial stability over the medium to long term.

The profitability implications of green banking are theoretically mediated through two opposing channels. On the benefit side, green banking strengthens reputational capital, attracts ESG-conscious institutional investors, reduces long-run energy and operational costs, and pre-empts future regulatory penalties associated with non-green portfolios (Asyura & Syahputri, 2023). On the cost side, green transformation demands substantial upfront investment in digital infrastructure, staff training, product redesign, and third-party sustainability verification, all of which depress short-run net income. The temporal mismatch between the immediate costs of green banking implementation and the delayed realization of its economic benefits constitutes the central theoretical explanation for the anticipated insignificant or negative short-term relationship between green banking initiatives and ROA (Asmara & Nugraeni Nugraeni, 2024; Thansania et al., 2025).

Banking Zakat

Zakat al-māl (wealth zakat), when applied to corporate entities, is known as zakat tijarah or business zakat. It is obligatory upon any Shari'ah-compliant entity whose net wealth exceeds the niṣāb threshold and has been held for one lunar year (haul). Within Islamic Commercial Banks (BUS), zakat activities encompass two principal components: corporate zakat and facilitated zakat. Corporate zakat is levied on the bank's eligible wealth, including shareholders' equity and retained earnings exceeding the *niṣāb* threshold, whereas facilitated zakat refers to zakat payments collected and administered by the

bank on behalf of depositors who elect to discharge their religious obligations through the institution (Septian et al., 2022).

Beyond its theological imperatives, banking zakat serves as a strategic instrument for institutional legitimacy. Regular and transparent zakat disbursement signals adherence to Islamic principles, cultivates public trust, deepens customer loyalty, and broadens the depositor base. These relational effects may, over time, translate into measurable improvements in profitability (Rhamadhani, 2017; Wardiwiyono & Jayanti, 2021; Nabillah & Oktaviana, 2022). This mechanism operates through reputation enhancement, a construct closely associated with the social dimension of the Triple Bottom Line (TBL), which subsequently contributes to the profit dimension by fostering business growth and expanding transaction volumes.

Corporate Social Responsibility (CSR)

CSR in the Islamic banking context is not merely a voluntary philanthropic add-on but a normative requirement rooted in the Qur'anic injunction to pursue *falāḥ* (comprehensive well-being) and avoid *fasād* (corruption or harm). Haniffa & Hudaib (2007) argue that the ethical identity of Islamic banks, manifested through their philosophy and values, governance practices, products and services, zakat and charitable activities, and community relationships, is a critical determinant of organizational legitimacy. By strengthening stakeholders' perceptions of ethical conduct and social responsibility, this ethical identity contributes to long-term business sustainability and institutional performance. This framework provides a richer conceptualization of CSR for BUS than the generic Carroll (1991) pyramid commonly applied in conventional settings.

Empirically, the CSR–financial performance relationship in banking is characterized by what Barnett & Salomon (2012) term an 'aspirational curve': firms at low and high levels of CSR engagement outperform those in the intermediate range, suggesting that both minimal-CSR and deeply embedded-CSR strategies can be financially viable, but half-committed CSR investment tends to impose net costs. Platonova et al. (2018), in a study of GCC Islamic

banks, find that voluntary CSR disclosure is positively and significantly associated with both current and lagged financial performance, suggesting a deferred but real profitability premium. By contrast, Scholtens (2009) and Mallin et al. (2014) find equivocal or null relationships in broader banking samples, attributing the ambiguity to methodological heterogeneity in CSR measurement and the mismatch between short reporting windows and long-run CSR payoff horizons. Nelling & Webb (2009) further caution that the commonly reported positive CSR–performance association is partially the result of reverse causality: profitable firms can afford greater CSR expenditure, not the other way around.

Hypothesis Development

Drawing on the Triple Bottom Line (TBL) framework, Stakeholder Theory, and the extant empirical literature, this study conceptualizes green banking, banking zakat, and corporate social responsibility (CSR) as strategic sustainability practices that shape the financial performance of Islamic Commercial Banks (BUS). Specifically, these non-financial activities are expected to affect ROA indirectly by enhancing corporate reputation, fostering customer trust, and strengthening organizational legitimacy.

Green Banking and ROA

Green banking is expected to enhance profitability through cost-efficiency gains, reputational enhancement, and access to a growing ESG-oriented investor and depositor base. Alifatussyahdiah et al. (2025) support this hypothesis empirically for Indonesian BUS. While Thansania et al. (2025) document a negative short-run effect attributable to transition costs, the prior literature generally suggests a potentially positive long-run relationship, though short-run evidence remains mixed, which motivates the following hypothesis:

H1: Green banking exerts a positive and significant influence on the Return on Assets (ROA) of Islamic Commercial Banks in Indonesia during the 2021–2024 period.

Banking Zakat and ROA

The mechanism linking banking zakat to ROA operates through enhanced reputational capital and deepened customer loyalty, consistent with both Stakeholder Theory and empirical findings from Rhamadhani (2017), Wardiwiyono & Jayanti (2021), Anggraeni & Gultom (2024), and (Nabillah & Oktaviana, 2022). The Shari'ah distinctiveness of zakat, as an observable and measurable indicator of Islamic commitment, makes it a particularly effective mechanism for building stakeholder trust within the Islamic banking market (Wajdi Dusuki & Irwani Abdullah, 2007).

H2: Banking zakat exerts a positive and significant influence on the Return on Assets (ROA) of Islamic Commercial Banks in Indonesia during the 2021–2024 period.

CSR and ROA

Although prior studies report mixed results, evidence from the Islamic banking sector, including the findings of Platonova et al. (2018) and Pratiwi et al. (2021), generally indicates a positive association between CSR and profitability. From the perspectives of the Triple Bottom Line (TBL) framework and Stakeholder Theory, CSR initiatives that are transparently communicated and strategically embedded within banking operations can foster stakeholder trust, enhance corporate reputation, reduce non-financial risks, and support long-term financial performance.

H3: Corporate Social Responsibility (CSR) exerts a positive and significant influence on the Return on Assets (ROA) of Islamic Commercial Banks in Indonesia during the 2021–2024 period.

Methods

Research Design

This study employs a positivist, quantitative research design with a causal-associative orientation. Given the observational nature of the data, the panel regression estimates conditional associations rather than causal effects in the

strict experimental sense. Panel data regression controls for unobserved individual heterogeneity across banks (fixed or random effects) while allowing efficient estimation from a small-N, multi-period dataset. The study period (2021–2024) spans four annual observations, capturing the post-pandemic recovery arc of Indonesian Islamic banking and straddling the implementation of OJK Sustainable Finance Roadmap II (2021–2025).

Population and Sampling

The population comprises all 14 BUS registered with and supervised by the Financial Services Authority (OJK) as of December 2024. Purposive sampling criteria require: (i) continuous operation throughout the 2021–2024 period; (ii) publication of complete annual reports and sustainability/CSR reports for each year; and (iii) availability of quantifiable green banking, zakat, and CSR data. Nine banks satisfy all criteria and constitute the final sample, yielding 36 balanced panel observations (9 × 4). The five excluded banks failed on criterion (i) or (ii): PT BPD Riau Kepri Syariah (partial-period data), PT Bank Victoria Syariah, PT Bank Panin Dubai Syariah, PT Bank Jabar Banten Syariah (incomplete sustainability disclosure), and PT Bank Nano Syariah (inaugural year only).

Variable Operationalization

Dependent variable – ROA (Y): Pre-tax profit divided by total assets, multiplied by 100. This definition aligns with Bank Indonesia Circular Letter No. 13/24/DPNP/2011 and the standard employed in the Islamic banking profitability literature. Given the heterogeneity of panel ROA values (ranging from −7.13% to 11.43%), no further scaling was applied; however, the Swamy-Arora estimator partially mitigates the influence of extreme observations (Athanasoglou et al., 2008; Sufian & Habibullah, 2009).

X1 (Green Banking): Quantified using a binary disclosure index derived from the Environmental Risk Index (ERI) approach, scoring each bank's sustainability report against a checklist of 17 green banking items drawn from OJK Regulation No. 51/POJK.03/2017 on Sustainable Finance and UNEP FI

green banking principles. The index score is expressed as a ratio (items disclosed / maximum possible items).

X2 (Banking Zakat): Total zakat funds disbursed by the bank as a corporate entity during the fiscal year, in IDR millions, as reported in annual reports and zakat distribution statements. Where a bank channels both corporate zakat and facilitated depositor zakat, the total disbursement figure is used. Given the highly right-skewed distribution of X2 (skewness= 5.12), a natural log transformation [ln (Zakat + 1)] was applied in a robustness check. Results were qualitatively consistent with the untransformed specification; the untransformed variable is retained in the main model for comparability with prior literature

X3 (CSR): Measured using the Islamic Social Reporting (ISR) disclosure index developed by Haniffa (2002) and extended by Othman et al. (2009), comprising 43 items across six dimensions: finance and investment, products and services, employees, community, environment, and corporate governance. The score is expressed as a percentage of maximum disclosure.

Panel Data Estimation

Consistent with prior studies on Islamic banking profitability (Athanasoglou et al., 2008; Sufian & Habibullah, 2009), this study incorporates conventional financial factors as important determinants of ROA. Specifically, capital adequacy ratio (CAR), operating efficiency (BOPO), financing-to-deposit ratio (FDR), and non-performing financing (NPF) are considered essential variables influencing bank profitability. These are excluded from the main specification to maintain parsimony and focus on the ESG dimensions; their omission is treated as a limitation and direction for future research. Model selection follows the sequential three-test protocol standard in panel econometrics. The Chow test compares the pooled OLS (Common Effect) against the Fixed Effect Model (FEM). The Hausman (1978) test evaluates whether the random effects are orthogonal to the regressors, determining the preference between FEM and the Random Effect Model (REM). Where the two tests conflict, the Lagrange Multiplier (LM) test (Breusch & Pagan, 1980)

arbitrates between CEM and REM. Classical assumption diagnostics (multicollinearity via correlation matrix; heteroscedasticity via weighted residual test) are conducted prior to final estimation. Hypothesis testing employs: (i) the partial t-test for individual coefficient significance at the 5% level (t-critical = 1.661 with 32 d.f.); (ii) the joint F-test for overall model significance; and (iii) the adjusted R^2 as the measure of explanatory power.

Results and Discussion

Descriptive Statistics

Table 2 presents the descriptive statistics for the variables used in this study. The analysis covers 36 balanced panel observations and provides an initial overview of the data distribution across ROA, Green Banking, Banking Zakat, and CSR. The results indicate that ROA varies considerably across observations, as reflected in its relatively high standard deviation. Banking Zakat also shows substantial dispersion and a highly skewed distribution, suggesting that zakat-related banking values differ widely among the sampled observations. In contrast, Green Banking and CSR display more stable distributions, with lower variation and relatively moderate skewness. These findings provide an empirical basis for further panel data regression analysis.

Table 2. Descriptive Statistics

Statistic	Y – ROA	X1 – Green Banking	X2 – Banking Zakat	X3 – CSR
Mean	54,287.56	784,313.6	16,915.80	716,806.6
Median	36,938.00	764,706.0	11.591	724,790.0
Maximum	248,034.0	941,176.0	464,000.0	828,571.0
Minimum	0.000	705,882.0	0.000	628,571.0
Std. Deviation	52,138.66	74,406.58	80,176.95	61,819.77
Skewness	1.930	0.640	5.124	0.304
Kurtosis	7.283	2.189	28.586	2.191
Jarque-Bera	49.857	3.441	1,139.495	1.538

Probability	0.000	0.179	0.000	0.463
Observations	36	36	36	36

Source: processed data (2025).

The descriptive statistics illuminate substantive differences in the distributional properties of each variable. ROA (Y) exhibits right-skewed, leptokurtic distribution (skewness = 1.93; kurtosis = 7.28), with the Jarque-Bera statistic rejecting normality at the 1% level, which is an expected feature of banking profitability data in a heterogeneous panel and not a threat to the validity of the REM given the relatively large cross-sectional variance absorbed by the random effects structure.

X1 (Green Banking) presents the most symmetric distribution (skewness = 0.64; kurtosis = 2.19), indicating relatively uniform adoption of green banking disclosure practices across sampled BUS, consistent with the sector-wide mandate of OJK Regulation No. 51/POJK.03/2017.

X2 (Banking Zakat) is dramatically right-skewed (skewness = 5.12; kurtosis = 28.59), with a standard deviation (80,176.95) approximately 4.7 times its mean (16,915.80), reflecting the extraordinary concentration of zakat disbursement in PT Bank Syariah Indonesia, which dwarfs all other sampled banks. Given this extreme skewness, a logarithmic transformation [ln (Zakat + 1)] was considered; however, the untransformed specification was retained for interpretability and comparability with prior literature. Sensitivity analysis with the log-transformed variable produced qualitatively consistent results.

X3 (CSR) is the most homogeneous variable (coefficient of variation = 8.6% calculated from the manually coded ISR distribution scores from the desirability reports and annual reports of each bank), suggesting that ISR disclosure scores have converged within a relatively narrow range, possibly owing to standardized reporting templates encouraged by OJK.

Panel Model Selection

Chow Test

The Chow test yields Cross-section F and Chi-square probabilities of 0.000, both below the 5% threshold, indicating that bank-specific intercepts are jointly significant and that the pooled OLS model is inappropriate. The Fixed Effect Model is thus preferred at this stage.

Hausman Test

The Hausman (1978) specification test evaluates whether the unobserved individual effects are correlated with the regressors. The test statistic returns a probability of 0.6888 > 0.05, failing to reject the null hypothesis of random effects orthogonality. This result is consistent with the orthogonality assumption underlying the Random Effect Model, supporting the use of REM over FEM for this dataset. The Hausman test shows the absence of systematic correlation between individual effects and predictor variables, which is a primary requirement for the validity of REM, not an independent guarantee of increased efficiency.

Lagrange Multiplier Test

The Breusch-Pagan LM test confirms that significant individual random effects exist (LM statistic significant at 5%), definitively ruling out the pooled CEM in favour of REM. The Random Effect Model estimated via Swamy-Arora component variance decomposition is the final specification, with cross-section random variance ($\sigma^2\alpha = 57{,}685^2$) accounting for approximately 84.5% of total residual variance (Rho = 0.845), confirming the importance of bank-level heterogeneity.

Classical Assumption Diagnostics

Multicollinearity

The pairwise correlation matrix of regressors yields: r(X1, X2) = 0.151; r(X1, X3) = 0.746; r(X2, X3) = 0.111. All coefficients fall below the critical threshold of |r| = 0.90 (or VIF < 10), confirming the absence of problematic multicollinearity. The moderate positive correlation between green banking

(X1) and CSR (X3) is theoretically expected, as both are sustainability disclosure constructs that tend to co-move with institutional commitment to ESG practices.

Heteroscedasticity

The weighted residual heteroscedasticity test produces probabilities of 0.6066 (X1), 0.4491 (X2), and 0.3114 (X3), all exceeding 0.05. The null hypothesis of homoscedastic disturbances is retained, confirming that REM standard errors are reliable for inference and that no correction (e.g., GLS weighting) is required beyond the Swamy-Arora estimator already applied.

Panel Data Regression Test Results: Random Effects Model (REM)

The panel data regression was estimated using the Random Effects Model (REM). The estimation used Panel EGLS with cross-section random effects. The data covered the period 2021 to 2024, with 4 periods, 9 cross-sections, and 36 balanced panel observations.

Table 3. Regression Coefficient Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	207,776.0	171,071.0	1.214.560	0.2334
X1	-0.095181	0.166974	-0.570034	0.5726
X2	0.131852	0.059889	2.201.605	0.0350
X3	-0.113095	0.178995	-0.631832	0.5320

Source: processed data (2025)

Based on the regression results, the estimated panel data regression equation is:

$$Y = 207{,}776.0 - 0.095181X_1 + 0.131852X_2 - 0.113095X_3$$

The constant term (207,776.0) is a mathematical artefact without direct substantive interpretation, as the condition of all independent variables simultaneously equalling zero carries no empirical meaning within the observed data range. The negative coefficient on X1 (−0.095181) implies a marginal inverse relationship between green banking disclosure and ROA; the

positive coefficient on X2 (+0.131852) indicates that each unit increase in banking zakat is associated with an increase in ROA; and the negative coefficient on X3 (−0.113095) suggests a marginal inverse association between CSR index values and ROA, ceteris paribus.

Hypothesis Testing

Partial t-Test

Table 4. Partial t-Test Results

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	207,776.0	171,071.0	1.214.560	0.2334
X1	-0.095181	0.166974	-0.570034	0.5726
X2	0.131852	0.059889	2.201.605	0.0350
X3	-0.113095	0.178995	-0.631832	0.5320

Source: processed data (2025)

Simultaneous F-Test

The F-test yields Prob. (F-statistic) = 0.0947 > 0.05, indicating joint insignificance. The adjusted R^2 = 0.1011 (10.11%) confirms that the explanatory power is modest, with the bulk of ROA variation (approximately 89.9%) attributable to factors outside this model. These results are entirely consistent with the established dominance of conventional financial determinants in Islamic bank profitability (Athanasoglou et al., 2008) (Sufian & Habibullah, 2009).

Table 5. Simultaneous Test Results

Indicator	Value	Indicator	Value
R-squared	0.178180	Mean dependent variable	11,367.99
Adjusted R-squared	0.101135	S.D. dependent variable	25,400.42
S.E. of regression	24,081.76	Sum squared residual	1.86E+10
F-statistic	2.312.663	Durbin-Watson statistic	1.795.871
Prob. (F-statistic)	0.094735		

Source: processed data (2025)

Coefficient of Determination (R^2)

The R-squared value of 0.1782 (17.82%) implies that green banking, banking zakat, and CSR jointly explain approximately 17.82% of the variance in Islamic Commercial Bank ROA over the 2021–2024 period. The remaining 82.18% of variation is attributable to factors outside the model, including credit quality, operational efficiency ratios, macroeconomic conditions, financing portfolio composition, and institution-specific strategic choices.

Discussion

Green Banking and ROA

The t-test results for X1 (Green Banking) yield a t-statistic of −0.570 (absolute value 0.570 < t-table 1.661) with a significance probability of 0.5726 > 0.05, leading to the rejection of H1. Therefore, green banking does not show a statistically significant effect, either positive or negative, on the ROA of Islamic Commercial Banks during the 2021–2024 period.

This finding is theoretically consistent with the TBL framework's recognition of temporal asymmetries in sustainability returns: the environmental and social investments characteristic of green banking tend to generate financial value over extended horizons (Elkington, 1998; Jeurissen, 2000). In the short four-year observation window, the upfront costs of digital transformation, clean energy adoption, and green product development likely suppressed any nascent profitability gains. The result aligns with the empirical findings of (Mustika et al., 2023), who report no significant direct impact of green banking on ROA, and with Thansania et al. (2025), who document a significant negative effect, attributing it to the initial cost burden of green transition. By contrast, Alifatussyahdiah et al. (2025) report a positive significant relationship, suggesting that outcome may be context- or period-specific.

Banking Zakat and ROA

The t-test for X2 (Banking Zakat) yields t = 2.2016 > t-table 1.661 with probability 0.0350 < 0.05, confirming a positive and statistically significant effect on ROA and leading to the acceptance of H2. This finding is the study's most robust result and carries important theoretical and practical significance.

This positive relationship is consistent with TBL's social pillar: zakat distribution, as a form of structured social investment, strengthens the bank's public legitimacy, increases reputational capital, deepens customer loyalty, and creates favorable conditions for business expansion, all of which ultimately have a positive impact on the profit dimension through increased asset productivity. This mechanism aligns with Freeman's (1984) stakeholder theory, whereby satisfying the expectations of a broad constituency generates sustainable competitive advantage. It is important to note that the panel regression model does not directly test intermediary channels such as legitimacy, loyalty, reputation, or deposit growth through which zakat affects ROA. The positive significant coefficient on X2 is consistent with this theoretical mechanism, but establishing the specific pathway requires mediation analysis, recommended for future research. Empirically, the finding corroborates the results of Anggraeni & Gultom (2024), Wardiwiyono & Jayanti (2021), Nabillah & Oktaviana (2022), and Rhamadhani (2017), all of whom document a positive and significant zakat–profitability relationship in the Islamic banking context.

CSR and ROA

The t-test for X3 (CSR) returns t = −0.632 (absolute value < t-table 1.661) with probability 0.5320 > 0.05, rejecting H3. CSR disclosure therefore does not exert a statistically significant influence on ROA during the study period.

This result partially conflicts with the TBL framework's prediction that social investment enhances long-term profitability. Two explanations are plausible. First, as with green banking, the benefits of CSR are inherently deferred: reputational gains, stakeholder goodwill, and risk mitigation advantages from CSR accumulate gradually and are unlikely to manifest in

measurable profitability improvements within a four-year window. Second, from a stakeholder theory perspective (Freeman, 1984), if CSR is implemented primarily as a regulatory compliance exercise rather than a strategically integrated value-creation tool, its contribution to ROA will be attenuated. The negative (though insignificant) coefficient is consistent with the findings of Baarsyah & Welkom (2025) and Faradiz et al., 2023), which reported negative CSR impacts and in the latter case a significant impact on ROA, suggesting that the costs of implementing CSR programs may slightly reduce short-term earnings.

Joint Effect of Green Banking, Banking Zakat, and CSR on ROA

The simultaneous F-test result (Prob. F-stat = 0.0947 > 0.05) indicates that the three variables, when tested jointly, do not produce a statistically significant combined effect on Islamic Commercial Bank ROA. The low explanatory power (R^2 = 17.82%) further confirms that profitability in Islamic banking is mainly driven by variables outside the scope of this model, the most important of which are capital adequacy (CAR), non-performing loan ratio (NPF), operational efficiency ratio (BOPO), financing to deposit ratio (FDR), and macroeconomic variables such as GDP growth and inflation (Athanasoglou et al., 2008; Sufian & Habibullah, 2009). Future research should integrate these conventional financial determinants with ESG variables to achieve a more comprehensive explanatory framework.

Conclusion

This study investigated the impact of green banking, banking zakat, and corporate social responsibility (CSR) on the Return on Assets (ROA) of nine Indonesian Islamic Commercial Banks from 2021 to 2024. The findings reveal that only banking zakat significantly enhances ROA, functioning as a core trust-building tool that deepens customer loyalty and expands the earning asset base. In contrast, green banking and CSR do not show significant short-term financial impacts, partly due to delayed repayment terms and a tendency to function primarily as regulatory compliance mechanisms in the current

period, although this interpretation is exploratory given the observational nature of the data. Jointly, these non-financial variables do not significantly explain ROA variations, confirming that conventional financial determinants continue to drive bank profitability. Theoretically, this study contributes to the Islamic finance literature by providing a multidimensional empirical analysis of ESG-aligned practices, namely green banking, banking zakat, and CSR, which are based simultaneously on the Triple Bottom Line, Stakeholder, and Legitimacy theories, an integrative framework that is relatively rare in the BUS profitability literature. It highlights that the financial materiality of sustainability in Islamic banking relies heavily on Shari'ah credibility, as uniquely evidenced by the success of zakat.

Practically, these insights advise bank management to prioritise a sustained, long-term strategic commitment to green banking and CSR initiatives, utilizing non-financial interim metrics while transparently professionalizing zakat management. To offset the short-term costs of environmental transitions, regulators should concurrently introduce supportive measures such as tax incentives, preferential risk-weighting, and capacity-building subsidies. Despite its contributions, this study is constrained by a small sample size, a short timeframe, and a reliance on self-reported metrics. Future research should address these limitations by extending the panel timeframe to eight to ten years, incorporating conventional financial controls like CAR, BOPO, FDR, NPF, and GDP growth, and utilizing externally verified ESG scores. In addition, exploring the role of zakat governance through a moderation or mediation model and replicating the analysis in other ASEAN Islamic banking systems such as Malaysia, Brunei, and Pakistan can provide broader regional insights regarding the generalizability of these findings.

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