e-Jurnal Apresiasi Ekonomi Volume 14, Nomor 1, Januari 2026 : 174-192 ISSN Cetak : 2337-3997
ISSN Online : 2613-9774

AN EVALUATION OF GREEN BANKING IMPLEMENTATION: IMPACTS ON FINANCIAL PERFORMANCE AND SUSTAINABILITY REPORTING QUALITY IN THE INDONESIAN BANKING SECTOR

Fania Naomi Hutauruk[1], Sari Wahyuni[2]

Postgraduate Program in Management Science, Faculty of Economics and Business,
Universitas Indonesia
Email: fania.naomi@alumni.ui.ac.id[1], sari.wahyuni@ui.ac.id[2]

ABSTRACT

The implementation of Green Banking (GB) in Indonesia, institutionalized through OJK Regulation No. 51/2017, represents a strategic pivot towards integrating Environmental, Social, and Governance (ESG) principles to advance the nation's sustainable development agenda. This study provides a comprehensive evaluation of the influence of GB implementation on financial performance—measured by Return on Assets (ROA), Return on Equity (ROE), and Non-Performing Loans (NPL)—and on the quality of sustainability reporting (SR). The research further investigates the mediating roles of Green Innovation (GI) and Corporate Reputation (CR), alongside the moderating effects of Corporate Governance (CG) and Institutional Ownership (IO). Adopting a sequential explanatory mixed-methods approach, the study first conducts a quantitative analysis of panel data from 16 leading Indonesian banks over the 2019–2023 period. The subsequent qualitative phase deepens these findings through in-depth interviews with 12 senior practitioners from five of the sampled banks. Quantitative results reveal that GB significantly and positively influences financial performance, as measured by ROA (β=0.4278, p=0.0190) and ROE (β=0.4052, p=0.0038), and also enhances SR quality (β=0.5853, p=0.0026). However, contrary to the hypothesis, GB was found to significantly increase NPL (β=0.4085, p=0.0271), indicating a rise in credit risk. The findings on mediation show that GI significantly mediates the relationship between GB and ROA (Sobel test p=0.0409) as well as NPL (p=0.0372), but not ROE (p=0.055). Conversely, CR does not significantly mediate the link between GB and SR quality (p=0.052). For moderation, CG is confirmed to significantly strengthen the positive relationship between GB and both ROA (p=0.0017) and ROE (p=0.0048). However, the moderating effect of CG on the GB-NPL relationship and the moderating influence of IO on the GB-SR relationship were not supported (p>0.05). Qualitative findings uncover the complex dynamics of GB implementation, including challenges in green credit allocation, pressure from short-term-oriented foreign shareholders, and strategic mitigation through the fortification of governance via sustainability committees. This research contributes theoretically by testing a hybrid mediation-moderation model. Practically, it offers actionable recommendations for regulators (OJK) and the banking industry to enhance regulatory incentives, safeguard green innovation, and optimize institutional ownership structures to accelerate Indonesia's sustainable finance transition.

Keywords: Green Banking, Sustainable Finance, Financial Performance, Sustainability Reporting, Green Innovation, Corporate Reputation, Corporate Governance, Institutional Ownership, Mixed-Methods.

INTRODUCTION

The Global Context: The Climate Crisis and the Financial Sector's Pivotal Role

Climate change has rapidly transformed from a latent threat into a palpable global crisis demanding immediate and decisive action. Data from premier climate monitoring institutions like NASA and the Copernicus Climate Change Service confirm that 2024 has set a record as the hottest year in recorded history, with the global average temperature surging past 1.66°C above pre-industrial levels (NASA, 2024; Copernicus, 2024). This temperature escalation not only breaches the 1.5°C safety threshold established by the Paris Agreement but also catalyzes a cascade of hydrometeorological disasters with escalating frequency and intensity. Reports from the Intergovernmental Panel on Climate Change (IPCC, 2023) and the World Bank (2022) consistently underscore the tangible impacts of this crisis, from extreme heatwaves imperiling public health and prolonged droughts devastating food security, to massive floods that paralyze vital infrastructure and settlements. The global economic losses stemming from climate-related disasters are projected to run into the trillions of dollars, threatening economic stability and social welfare worldwide.

In a collective response, the international community adopted the landmark Paris Agreement in 2015 under the UNFCCC's Conference of the Parties (COP21). This historic accord legally binds

196 nations to a shared commitment to curb the pace of global warming. Its primary mechanism operates through Nationally Determined Contributions (NDCs), wherein each country sets and periodically updates its greenhouse gas (GHG) emission reduction targets every five years. The Paris Agreement explicitly calls for a structural transformation towards a low-carbon economy—a feat achievable only through fundamental reforms across multiple sectors, with the financial sector assuming a uniquely central and strategic role (UNFCCC, 2015).

The financial sector, particularly banking, is widely regarded as the primary catalyst for this transition, owing to its profound capacity to direct capital flows and investment. Banks possess the power to mobilize the trillions of dollars required to fund renewable energy projects, green infrastructure, and eco-friendly technologies. Conversely, they can also accelerate environmental degradation by continuing to finance carbon-intensive sectors such as coal mining and other extractive industries. An acute awareness of this dual role has given rise to the concept of **Green Banking (GB)**, a banking paradigm that integrates Environmental, Social, and Governance (ESG) considerations into its core business strategy and operations. GB practices aim to shift the economic model from an exploitative one toward a green economy that harmonizes profitability (*profit*), social well-being (*people*), and environmental preservation (*planet*) (Marfuah et al., 2025).

Global GB initiatives have proliferated since the launch of the United Nations Environment Programme Finance Initiative (UNEP FI) in 1992. Another significant milestone was the adoption of the Equator Principles in 2003 by ten multinational banks, which established a benchmark for evaluating environmental and social risks in large-scale project financing. The recommendations from the Task Force on Climate-related Financial Disclosures (TCFD) in 2015 further propelled transparency, mandating that financial institutions disclose their climate-related risks and opportunities. As of 2023, over 3,800 financial institutions across more than 100 countries have adopted the TCFD framework (TCFD, 2023). This trend is buttressed by a surge in sustainable investment, which grew from USD 30.7 trillion in 2018 to USD 35.3 trillion in 2023, alongside the expansion of instruments like green bonds, sustainability-linked loans, and other innovative financial products (GSIA, 2023).

The Indonesian Context: Regulation and the Challenges of Green Banking Implementation

In Indonesia, consciousness of the imperative for sustainable finance began to crystallize in the early 2010s. Initial initiatives were manifested through a collaboration between Bank Indonesia (BI) and the Ministry of Environment from 2011–2013, which focused on providing environmental impact assessment (AMDAL) training for banking practitioners (OJK, 2014). This step was fortified by the issuance of Bank Indonesia Regulation No. 14/15/PBI/2012, which formally incorporated environmental aspects as a component in assessing the asset quality of debtors, including the use of the PROPER environmental performance rating.

The most significant momentum arrived when the Indonesian Financial Services Authority (OJK) launched its Sustainable Finance Roadmap in 2014, which was subsequently operationalized through OJK Regulation (POJK) No. 51/POJK.03/2017. This regulation became the primary legal framework mandating all financial service institutions, issuers, and public companies to formulate a Sustainable Finance Action Plan (RAKB) and report on its implementation annually. Since 2021, Bank Indonesia has also actively supported this ecosystem through a series of green macroprudential policies, such as a IDR 50 trillion liquidity incentive for environmentally friendly financing, a green inclusive financing ratio (RPIM), and the relaxation of Loan-to-Value (LTV) ratios for green property and electric vehicle loans (BI, 2023).

Despite Indonesia's progressive regulatory framework, implementation at the operational level continues to face significant hurdles. OJK data as of December 2023 reveals a wide compliance gap. Of the 105 commercial banks in operation, only 40 (36.4%) consistently submitted validated sustainability reports, while the majority still report on an ad-hoc basis with weak ESG substance (OJK, 2023). Many banks, particularly those in the BUKU 1 to 3 capital categories, now changed to KBMI, have yet to integrate a robust environmental and social risk management system (ESMS) and still rely on simplistic checklist approaches devoid of long-term impact analysis.

The practice of **greenwashing** has also emerged as a serious issue eroding public trust. OJK recorded 23 suspected cases of greenwashing between 2020 and 2023. One prominent case involved a bank that claimed to have disbursed trillions of rupiah in green financing, yet further investigation revealed that a substantial portion of these funds was channeled to disguised coal energy projects (OJK, 2023). The administrative sanctions imposed were deemed insufficient to create a meaningful deterrent, leaving the potential for similar practices to persist.

However, amidst these challenges, several banks have demonstrated extraordinary commitment and progress. CIMB Niaga, for instance, successfully disbursed IDR 52.55 trillion in sustainable financing in the third quarter of 2023, equivalent to 25.6% of its total credit portfolio. The bank is also an active participant in the carbon market (IDXCarbon) and is targeting net-zero emissions by 2050. Bank Danamon has also shown a positive trajectory, disbursing IDR 31.3 trillion in green loans and aiming for a 25% green portfolio share.

The Research Problem and Literature Gap

The chasm between the idealized regulatory framework and the on-the-ground reality of implementation constitutes the central problem motivating this research. While green banking is theoretically expected to enhance financial performance through efficiency gains, risk mitigation, and reputational enhancement (Birzhanova & Nurgaliyeva, 2022), empirical studies in Indonesia have yielded ambiguous and often contradictory results. Some research finds a significant positive relationship between green banking disclosure (measured by the Green Banking Disclosure Index/GBDI) and bank profitability (ROA/ROE) (Bose et al., 2018; Tia et al., 2023). However, other studies report a negative or insignificant relationship (Loissa, 2025; Rahmamita & Kahar, 2024), suggesting that initial implementation costs may outweigh short-term benefits, or that disclosures are merely ceremonial without substantive change.

This inconsistency also extends to contextual variables. The roles of corporate governance and institutional ownership show varied results. Some studies contend that independent boards of commissioners and larger board sizes can amplify the positive impact of GB on performance (Dewi, 2023; Marfuah et al., 2025), but the influence of institutional ownership remains a subject of debate. Some find a negative or insignificant effect (Asyura, 2023), while others suggest that government or foreign ownership can have complex moderating effects (Wanta & Herawaty, 2021).

These divergent findings signal a significant **research gap**. The majority of prior research has tended to examine the direct relationship between GB and performance, failing to explore the intermediary mechanisms (mediating variables) or contextual factors (moderating variables) that might explain the complexity of this relationship. This study seeks to fill that gap by proposing a more holistic research model. We test the mediating roles of **green innovation** and **corporate reputation**, as well as the moderating roles of **corporate governance** and **institutional ownership**. Green innovation is hypothesized as the mechanism that transforms green investments into operational efficiency and competitive advantage, while corporate reputation is posited as the bridge that enhances reporting credibility and stakeholder trust.

Research Questions and Objectives

Based on the background and the identified research problems, this study is formulated to address a series of key questions that remain unresolved in the existing literature. The inquiry first seeks to determine how the implementation of Green Banking directly influences the financial performance of banks in Indonesia, as measured by standard profitability and risk metrics. Concurrently, it investigates the extent to which these Green Banking practices affect the quality of sustainability reporting among Indonesian banks. Moving beyond these direct relationships, the research delves into the underlying mechanisms, questioning how green innovation contributes to mediating the connection between Green Banking and financial performance. In a similar vein, it explores how corporate reputation functions as a crucial intermediary, shaping the influence of Green Banking on the quality and transparency of sustainability disclosures. Finally, the study examines critical contextual factors by asking how corporate governance structures moderate the impact of Green Banking on financial outcomes and how institutional ownership patterns may strengthen or weaken the relationship between Green Banking and the quality of sustainability reporting.

To comprehensively answer these questions, the primary objective of this research is to analyze and evaluate the implementation of Green Banking in Indonesia through an integrated mediation-moderation model. By employing a mixed-methods sequential explanatory design, the study moves beyond merely testing causal relationships quantitatively. The initial quantitative phase establishes a statistical foundation by analyzing panel data from 16 leading Indonesian banks over the 2019–2023 period. The subsequent qualitative phase is designed to deepen and elaborate upon these findings through in-depth interviews with senior banking practitioners who have direct experience with Green Banking implementation. This dual approach allows the research to not only identify statistical correlations but also to explore the complex policy dynamics, organizational hurdles, and operational strategies that are often not captured by quantitative data alone, thus providing a holistic and contextualized understanding of the subject.

Research Contributions

This study is expected to make significant contributions, both theoretical and practical.

a. **Theoretical Contribution:** This research enriches the sustainable finance literature by proposing and testing a complex hybrid mediation-moderation model. By integrating Stakeholder Theory, Legitimacy Theory, Agency Theory, and the Resource-Based View, this study provides a more nuanced understanding of how internal factors (innovation, reputation, governance) and external factors (ownership) interact to determine the effectiveness of green banking strategies. Furthermore, this study tests the validity of the GBDI within an emerging market context like Indonesia.
b. **Practical Contribution:** For regulators such as OJK and BI, the findings of this study can serve as a basis for formulating more effective policies, such as refining POJK No. 51/2017, developing more targeted fiscal incentives, and strengthening oversight mechanisms to prevent greenwashing. For banking practitioners, this research offers strategic insights into the importance of integrating ESG into the core business model, strengthening governance, and investing in green innovation to achieve sustainable competitive advantage. For investors and the public, this study provides a framework for more critically evaluating the sustainability commitments of banks.

LITERATURE REVIEW

Theoretical Foundations

The implementation of Green Banking (GB) can be analyzed through multiple theoretical lenses from strategic management and organizational theory. The theoretical framework employed in this study is multidimensional, integrating external and internal perspectives to explain the adoption, implementation, and impact of sustainable finance practices.

a. **Institutional Theory:** Pioneered by Meyer & Rowan (1977) and DiMaggio & Powell (1983), this theory posits that organizations tend to adopt structures and practices deemed legitimate within their institutional environment. The adoption of GB by Indonesian banks can be viewed as a response to three types of isomorphic pressures:
    1. **Coercive Pressure:** Arising from formal regulations like POJK No. 51/2017, which mandates banks to report on sustainability practices.
    2. **Mimetic Pressure:** Occurring when banks imitate the practices of market leaders or competitors perceived as successful in implementing GB to reduce uncertainty.
    3. **Normative Pressure:** Generated by professional expectations and global standards, such as the adoption of the TCFD framework or the UNEP FI's Principles for Responsible Banking (PRB).
b. **Stakeholder Theory:** Developed by Freeman (1984), this theory argues that a firm's long-term success depends on its ability to create value for all stakeholders, not just shareholders. In the context of GB, stakeholders include regulators, customers, investors, employees, local communities, and environmental NGOs. Pressure from these diverse groups compels banks to be more transparent, accountable, and socially and environmentally responsible.
c. **Legitimacy Theory:** According to Suchman (1995), legitimacy is a generalized perception that an entity's actions are desirable, proper, or appropriate within some socially constructed system of norms, values, beliefs, and definitions. Banks implement and report on GB practices to gain and maintain social legitimacy. High-quality sustainability reporting functions as a signal to the public that the bank operates in line with societal expectations, thereby reducing reputational risk and enhancing trust.
d. **Resource-Based View (RBV) and Dynamic Capabilities:** Barney (1991) posits in RBV that sustainable competitive advantage stems from resources that are valuable, rare, inimitable, and non-substitutable (VRIN). In the GB context, capabilities such as expertise in climate risk management, a diversified green credit portfolio, and a reputation for sustainability can become strategic resources. The theory of Dynamic Capabilities (Teece et al., 1997) complements RBV by emphasizing an organization's ability to purposefully adapt, integrate, and reconfigure internal and external competencies to address rapidly changing environments. Green innovation (GI) is a manifestation of this dynamic capability.
e. **Agency Theory:** This theory (Jensen & Meckling, 1976) focuses on potential conflicts of interest between principals (shareholders) and agents (management). In the GB context, conflict can arise when management must balance long-term investments in sustainability (which may not yield immediate profits) with shareholder pressure to maximize short-term profitability. The roles of corporate governance (CG) and institutional ownership (IO) become crucial in aligning these interests.

Hypothesis Development

The Influence of Green Banking on Financial Performance (FP)

Theoretically, GB practices can enhance financial performance through several pathways. First, through operational efficiencies by reducing energy, water, and paper consumption. Second, by unlocking access to new and cheaper funding sources, such as green bonds or global climate funds. Third, by increasing customer loyalty and attracting new, environmentally conscious market segments. Fourth, by mitigating credit risk through more stringent environmental risk assessments of debtors. Empirical studies support this positive link. Bose et al. (2018) and Tia et al. (2023) found that GB disclosure has a significant positive impact on ROA and ROE. However, some studies in Indonesia have found contrary results, citing high initial investment costs and the uncertainty of green projects (Loissa, 2025). Despite mixed findings, strong theoretical arguments and the majority of evidence from the literature support a positive relationship.

H1: The implementation of Green Banking has a positive effect on a bank's financial performance.

The Influence of Green Banking on Sustainability Reporting (SR) Quality

Banks that substantively adopt GB practices tend to have a higher commitment to transparency and accountability. According to Legitimacy Theory, high-quality reporting is a means for banks to demonstrate to stakeholders their serious commitment to ESG principles. GB implementation requires banks to develop internal systems to track, measure, and manage environmental and social data, which directly enhances their capacity to produce comprehensive and credible sustainability reports. Marfuah et al. (2025) found that banks with higher GBDI scores also had better sustainability reporting scores.

H2: The implementation of Green Banking has a positive effect on the quality of a bank's sustainability reporting.

The Mediating Role of Green Innovation (GI)

Green innovation is the dynamic capability that enables banks to transform GB commitments into tangible competitive advantages. GI can take the form of new product development (e.g., sustainability-linked loans), adoption of new processes (e.g., service digitalization to reduce carbon footprints), or new business models (e.g., circular economy financing). These innovations can directly increase revenue (via new products) and reduce costs (via efficiency), thereby improving financial performance. GI serves as the bridge between high-level GB policy and its operational impact. A study by Asyura et al. (2023) showed that GI mediates the relationship between environmental strategy and firm performance.

H3: Green innovation mediates the relationship between Green Banking and a bank's financial performance.

The Mediating Role of Corporate Reputation (CR)

Reputation is a crucial intangible asset for any bank. Transparent and authentic GB practices can build a positive reputation as a responsible institution. This favorable reputation, in turn, incentivizes the bank to maintain high reporting standards to preserve public and investor trust. According to Signaling Theory, a quality sustainability report is a credible signal that reinforces reputation. Conversely, a strong reputation creates stakeholder expectations for continued transparency. Thus, reputation functions as a mechanism linking GB practices to reporting quality.

H4: Corporate reputation mediates the relationship between Green Banking and the quality of a bank's sustainability reporting.

The Moderating Role of Corporate Governance (CG)

The effectiveness of GB implementation is highly dependent on the quality of internal governance structures. A strong board of directors, with an adequate proportion of independent commissioners and ideally a dedicated sustainability committee, is more likely to effectively oversee and support GB strategy. According to Agency Theory and Stewardship Theory, good governance can align management's interests with the long-term goals of the company, including sustainability. Strong CG ensures that GB policies are not merely ceremonial but are genuinely integrated into strategic decision-making, thereby strengthening their impact on financial performance.

H5: Strong corporate governance strengthens the positive influence of Green Banking on a bank's financial performance.

The Moderating Role of Institutional Ownership (IO)

The influence of institutional ownership is complex. On one hand, institutional investors, particularly those from abroad, can import global ESG standards and demand greater transparency, thereby strengthening the link between GB and reporting quality. On the other hand, many institutional investors exhibit short-termism, focusing primarily on maximizing quarterly profits. This pressure can weaken a bank's commitment to long-term sustainability investments and encourage superficial reporting or greenwashing. Therefore, the influence of IO can

be ambiguous. This study tests the hypothesis that IO, particularly foreign ownership, may weaken this relationship due to short-term profitability pressures.

H6: High foreign institutional ownership weakens the positive influence of Green Banking on the quality of a bank's sustainability reporting.

RESEARCH METHOD

This study adopts a **sequential explanatory mixed-methods design**, a two-phase approach that sequentially combines quantitative and qualitative methods. The first phase, the quantitative stage, aims to test the developed hypotheses by analyzing secondary data. The second phase, the qualitative stage, aims to deepen, contextualize, and explain the findings from the quantitative phase through in-depth interviews with practitioners. This approach was chosen because it allows the researcher not only to identify "what" (the statistical relationships between variables) but also "why" and "how" (the underlying mechanisms and dynamics).

Population and Sample

The research population comprises all commercial banks listed on the Indonesia Stock Exchange (IDX) as of 2023, totaling 105 banks. The sample was selected using **purposive sampling** based on the following criteria: (1) the bank consistently published annual reports and sustainability reports throughout the research period; (2) complete data for all research variables were available; and (3) the bank is categorized as having significant asset scale and is active in sustainable finance initiatives. Based on these criteria, a sample of **16 banks** was selected, consisting of state-owned enterprises (BUMN and BUMD, such as Mandiri, BRI, BNI, BTN, BJB), both national private banks and private banks with foreign ownership such as Danamon, CIMB Niaga, OCBC NISP, Maybank, Permata, etc.. These 16 banks collectively represent over 60% of total national banking assets and 92% of total green financing in Indonesia, making the sample highly representative. The research period spans five years, from 2019 to 2023, yielding a total of **80 panel data observations** (a balanced panel).

Data Collection and Variable Measurement

Quantitative data were collected from publicly available secondary sources, including annual reports, sustainability reports, and stock market data published by the IDX and the official websites of the respective banks.

1. **Green Banking (GB):** The independent variable was measured using the **Green Banking Disclosure Index (GBDI)**, adapted from the research of Bose et al. (2018) and Marfuah et al. (2025). This index consists of 21 disclosure items covering environmental policies, green financing, operational efficiency, and social responsibility. Measurement was conducted via content analysis, assigning a score of 1 if an item was disclosed and 0 if not. The total score was then normalized.
2. **Financial Performance (FP):** This dependent variable was measured using two primary profitability indicators: **Return on Assets (ROA)**, calculated as net income divided by total assets, and **Return on Equity (ROE)**, calculated as net income divided by total equity.
3. **Sustainability Reporting (SR) Quality:** This dependent variable was measured using the **Sustainability Report Disclosure Index (SRDI)**, based on 91 indicators from the Global Reporting Initiative (GRI) G4 framework. Measurement was performed using content analysis similar to the GBDI.
4. **Green Innovation (GI):** This mediating variable was measured using two proxies: (1) the number of green patents registered by the bank with the Directorate General of Intellectual Property (DGIP), and (2) the allocation of funds for research and development (R&D) as a percentage of profit.
5. **Corporate Reputation (CR):** This mediating variable was measured using the **RepTrak score**, a global reputation index that assesses stakeholder perceptions of a company. Data were obtained from media sentiment analysis reports by research firms such as Meltwater.
6. **Corporate Governance (CG):** This moderating variable was measured with two indicators: (1) the proportion of independent commissioners on the board of commissioners (%), and (2) the size of the board of directors (number of members).
7. **Institutional Ownership (IO):** This moderating variable was measured as the percentage of total shares held by financial institutions, with a focus on foreign ownership.

Qualitative data were collected through **semi-structured interviews** with 12 key informants from five of the banks included in the quantitative sample. Informants were selected based on their direct involvement in implementing sustainability strategies (minimum 3 years of experience) and holding strategic positions (e.g., Head of Sustainability, Head of Enterprise Risk Management, Head of Implementation and Communication, and Sustainability Strategy and Reporting specialists.) Interviews were recorded,

transcribed verbatim, and analyzed using NVivo software.

Data Analysis Techniques

Quantitative data analysis was performed using EViews 13 software.

1. **Panel Data Regression Analysis:** To test the direct relationship hypotheses (H1 and H2) and moderation hypotheses (H5 and H6), a panel data regression model was used. The selection of the best model among the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM) was determined through a series of statistical tests (Chow Test, Hausman Test, and Lagrange Multiplier Test).
2. **Mediation Test:** To test the mediation hypotheses (H3 and H4), the **Sobel Test** was employed. This test statistically evaluates the significance of the indirect effect of an independent variable on a dependent variable through a mediator.
3. **Classical Assumption Tests:** Prior to model interpretation, a series of classical assumption tests were conducted, including tests for normality, multicollinearity, heteroskedasticity, and autocorrelation, to ensure the resulting regression model was a Best Linear Unbiased Estimator (BLUE).

Qualitative data analysis utilized a **thematic analysis** approach. Interview transcripts were systematically coded to identify key themes, patterns, and insights relevant to the research questions. The coding process was hybrid (both inductive and deductive) to capture emergent themes from the data while also validating the existing conceptual framework.

RESULT AND DISCUSSION

This section presents the results of the quantitative data analysis and the principal findings from the qualitative analysis.

Quantitative Analysis and Hypothesis Testing

Descriptive Statistics

A descriptive statistical analysis was conducted to provide a foundational understanding of the data characteristics for the sample of 16 Indonesian banks over the 2019–2023 period, comprising 80 balanced panel observations. This analysis examines the central tendency and dispersion for the study's core variables: Green Banking (GB), Financial Performance (FP, measured by ROA, ROE, and NPL), Sustainability Reporting Quality (SR), Green Innovation (GI), Corporate Reputation (CR), Corporate Governance (CG), and Institutional Ownership (IO).

Table 1. Descriptive Statistic Results for 16 banks (80 samples)

Sample: 2019 2023

	ROA	SR	GB	GI	CR	CG	IO
Mean	1.267416	0.668269	0.758333	1.913697	0.716858	0.462171	63.37342
Median	1.391824	0.747251	0.785714	1.100000	0.746500	0.472222	66.78000
Maximum	4.220000	1.000000	0.904762	13.00000	0.948600	0.800000	98.94000
Minimum	-7.160000	0.208791	0.476190	0.200000	0.480000	0.100000	9.650000
Std. Dev.	1.781674	0.182388	0.109739	2.090241	0.079194	0.119701	30.08658
Skewness	-2.258762	-0.814188	-0.832194	2.504946	-0.984149	-0.123702	-0.317207
Kurtosis	11.00056	2.670530	2.835083	11.87379	5.213983	3.363881	1.603356
Jarque-Bera	281.3897	9.200526	9.324618	346.1437	29.25307	0.645395	7.843646
Probability	0.000000	0.010049	0.009445	0.000000	0.000000	0.724193	0.019805
Sum	101.3933	53.46155	60.66667	153.0958	57.34860	36.97369	5069.873
Sum Sq. Dev.	250.7746	2.627972	0.951361	345.1596	0.495468	1.131931	71510.96
Observations	80	80	80	80	80	80	80

Source: Eviews

The results indicate varied distributions across the variables. Key financial performance indicators such as **Return on Assets (ROA)** and **Return on Equity (ROE)** showed considerable volatility, with standard deviations (1.782 and 12.021, respectively) exceeding their means (1.267 and 8.045, respectively), suggesting a wide and somewhat random spread in profitability among the sampled banks. Conversely, **Non-Performing Loans (NPL)**, with a mean of 3.014 and a standard deviation of 1.829, exhibited a more uniform distribution. The sustainability metrics, **Sustainable Reporting (SR)** and **Green Banking (GB)**, also displayed relatively consistent patterns with means of 0.668 and 0.758 and standard deviations of 0.182 and 0.110, respectively. **Green Innovation (GI)** presented the most significant variation, with a high standard deviation (2.090) relative to its mean (1.914), reflecting disparate levels of investment in green innovation across the sector. **Corporate Reputation (CR)** was the most stable variable (mean 0.717, std. dev. 0.079), while **Corporate Governance (CG)** (mean 0.462, std. dev. 0.120) and **Institutional Ownership (IO)** (mean 63.37%, std. dev. 30.09%) showed moderate to wide dispersion.

A Jarque-Bera test for normality revealed that the residuals for several variables were not normally distributed ($p < 0.05$). However, given the sample size of 80 observations ($n \geq 30$), this

deviation is considered acceptable under the Central Limit Theorem (CLT), allowing for robust regression analysis.

Panel Data Model Selection

To analyze the panel data, this study employed a systematic process to select the most appropriate regression model from the Common Effect Model (CEM), Fixed Effect Model (FEM), and Random Effect Model (REM). The selection was guided by three standard statistical tests: the Chow Test (F-test), the Hausman Test, and the Lagrange Multiplier (LM) Test.

Based on the test results for the four primary regression equations in this study, the Random Effect Model (REM) was determined to be the most suitable for the first and second equations. For the third equation, the Common Effect Model (CEM) was selected. Finally, for the fourth equation, the Fixed Effect Model (FEM) was chosen as the most appropriate estimation technique. This rigorous selection process ensures that the chosen models effectively account for the specific characteristics of the panel data, thereby yielding more reliable and accurate estimates.

Classical Assumption Tests and Model Estimation

Prior to interpreting the regression results, a series of classical assumption tests were performed on the selected models to ensure the estimates are Best Linear Unbiased Estimators (BLUE). These tests included checks for normality, multicollinearity, heteroskedasticity, and autocorrelation. All selected models successfully passed these diagnostic tests, confirming their statistical validity.

The analysis proceeded with the estimation of the final regression models. For the first two models, the **Random Effect Model (REM)** was employed, which accommodates unobserved heterogeneity by treating individual-specific effects as random. For the third model, the **Common Effect Model (CEM)** was used, which pools the data and assumes a constant intercept and slopes across all banks and time periods. The fourth model utilized the **Fixed Effect Model (FEM)**, which controls for time-invariant unobserved individual characteristics that may be correlated with the independent variables.

The key regression equation for the impact of Green Banking on financial performance (ROA) is specified as:

$FP\_it = \beta0 + \beta1\ GB\_it + \beta X\ Controls\_it + \varepsilon\_it$

The regression equation examining the relationship between Green Banking and Sustainability Reporting (SR) quality is:

$SR\_it = \beta0 + \beta1\ GB\_it + \beta X\ Controls\_it + \varepsilon\_it$

This model confirmed that Green Banking (GB) positively and significantly influences Sustainability Reporting (SR) quality ($\beta=0.5853$, $p<0.05$), supporting H2. However, the mediating effect of Corporate Reputation (CR) was found to be insignificant ($p>0.05$), leading to the rejection of H4. The models examining the mediating pathways were specified as:

$GI=\beta0+\beta1(GB)+\epsilon$

$CR=\beta0+\beta1(GB)+\epsilon$

The results confirmed that Green Banking (GB) has a significant positive influence on both Green Innovation (GI) and Corporate Reputation (CR), establishing the first condition for mediation. Subsequent Sobel tests confirmed the mediating roles of these variables as detailed in the hypothesis testing section.

Finally, to test the moderation hypotheses (H5, H6), Moderated Regression Analysis (MRA) is employed. This involves adding the interaction variables GB×CG and GB×IO to the regression models as follows:

Model (3): $FPit=\beta0+\beta1GBit+\beta2CGit+\beta3(GBit\times CGit)+\beta XControlsit+\epsilon it$

Model (4): $SRit=\beta0+\beta1GBit+\beta2IOit+\beta3(GBit\times IOit)+\beta XControlsit+\epsilon it$

Direct Effect Hypothesis Testing

The tests for the direct influence of Green Banking (GB) on Financial Performance (FP) and Sustainability Reporting (SR) Quality yielded the following results:

ISSN Cetak : 2337-3997
ISSN Online : 2613-9774

Table 2. H1 and H2 Results

Hypothesis	Coefficient	Std. Error	t-Statistic	Prob.	Conclusion
H1.1: GB → ROA (positive)	0.427805	0.112421	3.805370	0.0190	**Accepted**
H1.2: GB → ROE (positive)	0.405260	0.067151	6.035053	0.0038	**Accepted**
H1.3: GB → NPL (negative)	0.408560	0.119967	3.405613	0.0271	**Rejected**
H2: GB → SR (positive)	0.585306	0.187917	3.114699	0.0026	**Accepted**

Note: For H1.3, the hypothesis was rejected because the coefficient's direction was positive (increasing NPL), contrary to the expected negative direction (decreasing NPL), despite being statistically significant.

Source: Eviews 13

Mediation Test (Sobel Test)

According to Baron & Kenny (1986), a mediating variable is one that bridges the influence of an independent variable on a dependent variable. The Sobel test was used to evaluate the significance of this indirect effect.

a. **H3: Mediation by Green Innovation (GI)**
   1. **GB → GI → ROA (H3.1):** The Sobel test yielded a probability value for the mediation effect of **0.0409 (< 0.05)**. This indicates that Green Innovation (GI) significantly mediates the relationship between Green Banking (GB) and the increase in ROA. Therefore, hypothesis **H3.1 is Accepted**.
   2. **GB → GI → ROE (H3.2):** The probability value for the mediation effect was **0.055 (> 0.05)**. This indicates that GI does not significantly mediate the relationship between GB and the increase in ROE. Therefore, hypothesis **H3.2 is Rejected**.
   3. **GB → GI → NPL (H3.3):** The probability value for the mediation effect was **0.0372 (< 0.05)**. This indicates that GI significantly mediates the relationship between GB and NPL. Therefore, hypothesis **H3.3 is Accepted**.

b. **H4: Mediation by Corporate Reputation (CR)**
   1. **GB → CR → SR:** The Sobel test showed a probability value of **0.052 (> 0.05)**. This indicates that Corporate Reputation (CR) does not significantly mediate the relationship between Green Banking (GB) and the Quality of Sustainability Reporting (SR). Therefore, hypothesis **H4 is Rejected**.

Moderation Test (Moderated Regression Analysis - MRA)

Moderated regression analysis was used to test whether a moderating variable strengthens or weakens the relationship between the independent and dependent variables.

Table 3. MRA Test Results for H5 and H6

Hypothesis	Interaction Coefficient	Std. Error	t-Statistic	Prob.	Conclusion
H5.1: CG moderates GB → ROA	0.468496	0.076163	7.436297	0.0017	**Accepted**
H5.2: CG moderates GB → ROE	0.522384	0.092050	5.675020	0.0048	**Accepted**
H5.3: CG moderates GB → NPL	0.526784	0.147129	3.580424	0.0232	**Rejected**
H6: IO moderates GB → SR	0.001267	0.000643	1.969818	0.0525	**Rejected**

Note: For H5.3, the hypothesis was rejected because although significant, the interaction with CG actually strengthened the impact of increasing NPL, contrary to what was expected.

Source: Eviews 13

Key Qualitative Findings

Thematic analysis of in-depth interviews with practitioners from five banks yielded several

key insights that enrich and explain the quantitative results.

a. Governance as the Foundation of Sustainability Strategy.
   Governance as the Foundation of a Proactive Sustainability Strategy. Informants consistently emphasized that a strong "tone at the top" is the primary prerequisite for successful GB implementation. This goes beyond mere compliance; leading banks have established dedicated Sustainability Oversight Committees at the board level and integrated ESG Key Performance Indicators (KPIs) into executive remuneration systems. A Head of Sustainability stated, "Good governance is not just about compliance; it's a catalyst for improved financial performance through more effective Green Banking implementation." This finding explains why Corporate Governance was found to significantly moderate the relationship between GB and financial performance. Despite the green banking regulation (POJK 51/2017) only being effectively implemented since 2019, these governance structures have enabled banks to rapidly pivot towards a more strategic and proactive stance on sustainability.
b. Green Innovation and Proactive Client Engagement as Drivers of Value and Risk.
   Leading banks are actively investing in green R&D, and this innovation has proven to increase efficiency and open new markets, supporting the finding of GI's mediation effect on ROA. This is most evident in the development and deployment of sophisticated financial products such as Sustainability-Linked Loans (SLLs) and green mortgages. With SLLs, for example, banks tie a client's interest rate directly to their achievement of predetermined sustainability targets, creating a powerful financial incentive for greener operations. Similarly, green mortgages offer preferential terms for properties that meet certified energy-efficiency standards. This product-level innovation is the tangible manifestation of a broader strategy to actively engage their clients in the green transition. In the short period since 2019, these banks have moved beyond internal metrics to proactively work with customers in high-impact sectors, such as palm oil, mining, energy, and even SMEs to encourage greener operations. This is achieved through a combination of rigorous due diligence, where legitimate environmental certifications are verified, and the provision of powerful incentives. For instance, clients who commit to and achieve specific sustainability targets, such as installing solar panels or adopting cleaner technologies, are offered tangible benefits like lower interest rates on loans. However, informants also acknowledged the associated risks. A source from one of the banks mentioned, "The payback on green projects is long, and credit risks must be strictly mitigated." This provides context for the quantitative finding of increased NPLs, where financing immature green projects or technologies can elevate credit risk in the initial stages.
c. The Dilemma of Foreign Institutional Ownership.
   The interviews revealed a divided view on the role of foreign investors. On one hand, for several large banks, guidance from their foreign parent companies drives the adoption of global ESG standards. However, in other banks, pressure from foreign institutional investors to achieve short-term profitability was perceived as a hindrance to long-term sustainability investments. An informant from one of the national private banks stated, "There's a dilemma between meeting long-term sustainability targets and the quarterly profit pressure from the group." This helps explain why Institutional Ownership was not found to be a significant moderator and, in fact, trended towards weakening reporting quality.
d. Reputation as a Strategic Asset and a Double-Edged Sword.
   Banks consciously use sustainability reporting to build their reputation. Events like CIMB Niaga's "The Cooler Earth" summit or another bank's mangrove planting program are part of their ESG communication strategy. A positive reputation creates high public expectations, which in turn drives improvements in reporting quality. However, there is also a palpable fear of greenwashing. To mitigate this, leading banks implement multi-layered audits, including external assurance by independent bodies like TÜV Rheinland or PwC, to ensure their sustainability claims are credible.

Discussion

The analysis in this study presents a complex and multifaceted picture of Green Banking implementation in Indonesia. The findings not only confirm several theoretical assumptions but also unveil paradoxes and unique dynamics within an emerging market context.

The Synergy between Sustainability and Profitability

The research results strongly indicate that integrating ESG principles into banking strategy is not a trade-off with financial performance but rather a synergy. The significant positive influence

of GB on ROA and ROE confirms the argument from the Resource-Based View that sustainability capabilities can be a source of competitive advantage. Studies by Nouaili & Khemiri (2025) in the MENA region corroborate these findings, demonstrating that banks with strong green growth initiatives experience enhanced profitability, particularly when measured by return on equity. Similarly, Deloitte's collaborative research with the European Investment Bank found that commercial banks with good performance on material ESG issues outperform banks with poor performance on the same issues by more than 2%.

The qualitative interviews clarified the mechanism: pioneering banks successfully create value by diversifying their portfolios into green sectors, enhancing operational efficiency through digitalization, and strengthening customer loyalty. Strategies like offering sustainability-linked loans with incentive interest rates not only drive decarbonization in the real sector but also prove to maintain a stable Net Interest Margin (NIM), as revealed by a practitioner from one of the leading banks. This finding aligns with the research by Rachman (2021) on Indonesian banks listed in the Sri-Kehati Index, which found a positive correlation between green banking practices and profitability, especially in terms of ROA and ROE. Furthermore, studies from ASEAN banking sector confirm that green banking disclosure has a positive and significant influence on banking performance as measured using ROA and ROE. This demonstrates that sustainability can be commercially integrated without sacrificing profitability, supporting the contention by SAP Fioneer (2023) that companies implementing policies and practices to address sustainability create more value, generate higher equity returns, and see a reduction in downside risk.

The Paradox of Green Credit Risk

One of the most compelling findings is the positive correlation between GB practices and an increase in Non-Performing Loans (NPLs). Intuitively, green financing should lower risk, as environmentally compliant debtors are assumed to be more resilient. However, this finding exposes a tangible "transition risk" that has been extensively documented in recent literature. Projects in the renewable energy or circular economy sectors often involve new technologies and unproven business models, thus carrying a higher risk profile in their initial stages. As revealed in the interviews, long payback periods and market uncertainties are primary challenges. This paradoxical relationship has been observed in other emerging markets, where studies show that extensive disbursement of green credit can initially have a negative impact on profitability due to higher associated risks. Research by Purkayastha (2018) from the Asian Development Bank emphasizes that credit risk assessment and ratings tend to overstate credit risk and thereby constrain finance for clean energy projects, as factors like inadequate credit information, lack of historical data at the project level, and higher risk of technological obsolescence lead to credit market failure in clean energy finance. Interestingly, studies from emerging markets including Indonesia, Russia, Turkey, Brazil, China and India found that green credit variables have a negative and significant relationship to non-performing loans in the long term, suggesting that while initial implementation may increase risk, mature green finance portfolios eventually reduce NPLs. The UAE banking sector research confirms this nuanced relationship, where green loans initially pose higher risks but contribute to overall portfolio stability over time. This finding highlights the critical need for developing climate and environmental risk management capacity within banks. Without adequate expertise to assess and mitigate these new risks, the good intention of funding the green transition could inadvertently jeopardize a bank's financial stability. The role of strong governance becomes crucial here, not just to promote green financing but to ensure it is done prudently.

The Central Roles of Governance and Innovation

This study affirms that governance and innovation are the two central pillars determining the success of a GB strategy. The strong moderating effect of CG demonstrates that commitment from the board of directors and top management is a decisive factor. When ESG KPIs are integrated into executive remuneration and overseen by an independent sustainability committee, GB policies tend to be more substantive and have a tangible impact on performance. This aligns with Agency Theory, where effective governance mechanisms can align the interests of the agent (management) with the long-term goals of the principal (the company and its stakeholders). Studies by Dicuonzo et al. (2022) on European systematically important banks reveal growing awareness of banks to integrate sustainability in their corporate governance, with contributions especially driven by the boards of directors, whose size and composition contribute positively to overall sustainable performance. Research by Del Sarto (2025) using a dynamic panel dataset of 88 European banks found that strong governance structures, characterized by board diversity and independence, effectively

moderate the relationship between ESG controversies and bank risk.

Green innovation, as a manifestation of dynamic capabilities, proved to be a vital bridge transforming policy into results. The theoretical foundation for this relationship is strengthened by recent research that demonstrates how bank digital transformation enhances corporate green innovation through alleviating financing constraints and inhibiting corporate financialization. Studies by Wang et al. (2024) on Chinese commercial banks found that ESG performance can promote green innovation, with this promotion being more obvious when bank remuneration incentives are effective. However, the fact that GI's mediation was only significant for ROA (not ROE) and NPL suggests that the impact of innovation is not always immediate or uniform. This partial mediation effect has been observed in other studies, where green innovation capabilities require integration with dynamic capabilities theory to enhance adaptability and long-term value creation. Investors may not yet fully appreciate the long-term value of green R&D, and the inherent risks of innovation can increase asset volatility in the short term. Research by Xia & Liu (2022) confirms that bank competition promotes corporate green innovation by reducing transaction costs and increasing the possibility and quantity of firms applying for green patents, but the effects vary across different performance measures.

The Complexity of External Influences: Reputation and Ownership

The finding that corporate reputation did not statistically mediate the relationship between GB and reporting quality (though the p-value was close to the threshold) suggests a potential for decoupling. Banks may succeed in building a green image, but this is not necessarily followed by a substantive increase in transparency. Research by Judijanto et al. (2024) in the Indonesian banking industry found that green financing, sustainability report transparency, and ESG implementation all have significant positive effects on corporate reputation, with ESG implementation having the strongest influence. However, the risk of greenwashing remains a significant concern, as highlighted by Venturelli et al. (2024) who found that ESG washing increases a bank's reputational exposure, particularly when environmental claims are not backed by performance. The qualitative interviews indicated that leading banks are highly aware of the risk of greenwashing and strive to mitigate it through external verification. Studies from Pakistan's FinTech and banking sectors reveal that greenwashing challenges include stakeholder distrust, regulatory compliance issues, market confusion, and reputational risk, requiring effective strategies such as stakeholder engagement, third-party verification, and enhanced risk management. This implies that reputation will only become an effective mediator if it is supported by authentic and auditable performance evidence, as emphasized by the European Banking Authority's progress report on greenwashing monitoring, which highlights the adverse impact that greenwashing can have on financial risks and consumer trust.

Similarly, the non-significant moderating role of foreign institutional ownership highlights the dilemma faced by banks in emerging markets. Pressure from global investors can be a double-edged sword: it can drive the adoption of international standards while simultaneously imposing a focus on short-term profitability that can hinder sustainability investments. Research by Lin et al. (2025) using Korean manufacturing firms found that under negative financial feedback, firms with higher foreign ownership reduce ESG engagement by prioritizing short-term returns. This finding is consistent with studies from Taiwan showing that foreign ownership, particularly trust funds, exhibits a negative moderating effect on the relationship between sustainability reporting and company stock market performance. The European Banking Authority's report on short-term pressures confirms that banks focused on short-term profitability are more likely to pass on this focus to corporates and less likely to support long-term projects. However, research from Indonesian state-owned banks suggests that foreign ownership can have positive effects when properly managed, as foreign investors often prioritize environmental and sustainability considerations, encouraging more transparent green banking practices. This suggests that the characteristics and orientation of investors (long-term vs. short-term, activist vs. passive) are more important than mere ownership status (foreign vs. domestic), as confirmed by studies showing that institutional ownership plays an essential role in minimizing agency costs and supporting effective corporate governance mechanisms.

CONCLUSION

Conclusion

This research concludes that the implementation of Green Banking in Indonesia has demonstrated a significant positive impact on both financial performance and the quality of sustainability reporting, aligning with global findings that sustainability practices can enhance firm value (Tia et al., 2023; Bose et al., 2018). However, the process is accompanied by

challenges such as increased credit risk during the initial transition phase, which is consistent with the concept of transition risk discussed in emerging markets literature (Smuda-Kocoń, 2023; Hong, 2025). This paradoxical relationship between green banking and Non-Performing Loans (NPLs) is not unique to Indonesia but has been observed across multiple emerging economies where extensive disbursement of green credit can initially have a negative impact on profitability due to higher associated risks (Naili & Lahrichi, 2022). The success of a Green Banking strategy is not determined by a single factor but by a complex interplay of internal commitment, innovative capabilities, and contextual factors such as governance and ownership structure (Adu, 2023; Wang et al., 2024). Strong corporate governance proved to be a crucial enabler that amplifies the positive impact of Green Banking, echoing findings from Sub-Saharan African banking studies which confirm that banks with higher levels of corporate governance disclosure engage in more climate change initiatives (Adu, 2023). Meanwhile, green innovation serves as an essential mechanism for transforming commitment into economic value, aligning with the dynamic capabilities perspective that emphasizes how financial innovation can catalyze green finance implementation (Allie & Augustine, 2023). Conversely, the influence of external forces like reputation and institutional ownership remains ambiguous, underscoring the importance of authenticity and stakeholder alignment, as discussed in the broader sustainable banking literature (EBA, 2023; KPMG, 2023). Overall, Green Banking is no longer merely an ethical choice but a strategic imperative for the Indonesian banking sector to achieve resilient and sustainable growth, consistent with findings from the Sustainable Banking Network's global progress reports (World Bank, 2019).

Implications

Managerial Implications: Bank management must view sustainability as a core component of business strategy, not a peripheral function. This entails allocating adequate resources to green innovation, building climate risk management capacity, and embedding a culture of sustainability supported by a robust governance structure from the board level down to operations (Adu, 2023; Allie & Augustine, 2023). The paradoxical finding that green banking practices initially increase NPLs necessitates enhanced risk management capabilities specifically tailored to green credit portfolios, as recommended by recent studies on green lending risks in emerging markets (Naili & Lahrichi, 2022). Transparent and authentic communication with investors about the long-term value of ESG strategies is also crucial to managing market expectations and avoiding greenwashing accusations, as emphasized by the European Banking Authority's comprehensive analysis of greenwashing risks (EBA, 2023). Banks must implement comprehensive greenwashing risk management frameworks that include proper governance structures, risk appetite definitions, and monitoring mechanisms to prevent reputational damage from misleading sustainability claims (KPMG, 2023).

Policy Implications: For regulators like OJK and Bank Indonesia, this study suggests the need for a more nuanced policy approach. Beyond mandating sustainability reporting, regulators should foster a supportive ecosystem through harmonizing national green taxonomies and reporting standards with international best practices, as demonstrated by successful implementations in other emerging markets within the Sustainable Banking Network (World Bank, 2019). Providing stronger fiscal and macroprudential incentives for green financing while developing clear transition risk management frameworks to help banks manage initial NPL increases during the green transition period is essential (Smuda-Kocoń, 2023). Strengthening oversight to effectively mitigate greenwashing requires enhanced supervision capabilities and clearer definitions of sustainable finance activities, as highlighted by the European Central Bank's assessment of climate-related disclosures (ECB, 2022). The regulatory framework should also address the information asymmetries and measurement challenges identified in ESG disclosure quality studies, ensuring that sustainability reporting provides meaningful and comparable information to stakeholders (Aatikah & Mutmainah, 2024).

Limitations and Future Research Directions

This study has several limitations that present opportunities for future research. First, the sample is limited to 16 large banks, which may not be representative of smaller or regional banks operating in different institutional contexts, as noted in recent studies of banking sustainability in emerging markets (Ridho & Vinichenko, 2024). Second, the five-year research period may not fully capture the long-term impacts of sustainability initiatives, especially given the evolving regulatory landscape and the relatively recent implementation of sustainable finance regulations since 2019 (Tampikalih & Syafri, 2025). Third, the measurement of variables such as green innovation and reputation relies on proxies that have inherent limitations, suggesting the need for more granular

data collection methods, as identified in studies examining the relationship between green finance and environmental performance (Siahaan et al., 2021). Future research could extend the analysis over a longer horizon to observe whether green credit risks decline as the market matures and banks develop enhanced risk assessment capabilities for green projects, following the trajectory observed in more established green finance markets (Hong, 2025). Comparative studies across ASEAN countries could shed light on how different regulatory environments and institutional frameworks influence green banking effectiveness, building on the cross-country analysis frameworks developed by the Sustainable Banking Network (World Bank, 2019). Additionally, project-level or loan-level data could provide deeper insights into the success factors of green financing and help address the paradoxical relationship between green banking and credit risk observed in this study, as suggested by emerging research on green credit risk management in developing economies (Naili & Lahrichi, 2022).

ACKNOWLEDGEMENT

We would like to express our deepest gratitude to all parties who have contributed to this research. Thank you to colleagues who have provided advice, support, and inspiration during the research process. We would also like to thank all participants and respondents who have taken the time to participate in this research. We would also like to thank the institutions that have provided support and facilities in carrying out this research. All contributions and assistance provided are very meaningful for the smoothness and success of this research. Thank you for all the hard work and collaboration that has been established.

BIBLIOGRAPHY

Aatikah, N. Y., & Mutmainah, S. (2024). Does ESG disclosure and audit quality influence the bank's financial performance? *International Journal of Economics Development Research, 5*(3), 2281-2303.

Adu, D. A. (2023). Sustainable banking initiatives, environmental disclosure and financial performance: The moderating impact of corporate governance mechanisms. *Corporate Social Responsibility and Environmental Management, 30*(4), 1876-1891.

Allie, R., & Augustine, Y. (2023). Analysis of the effect of green banking, corporate social responsibility, ultimate ownership on bank performance with good corporate governance as a moderating variable. *Technium Sustainability, 5*, 75-89.

Astuti, R., & Juwenah, J. (2017). Pengaruh Sustainability Reporting terhadap Kinerja Keuangan Perusahaan. *Jurnal Akuntansi Multiparadigma, 8*(2), 234–247.

Asyura, A., Fadli, M., & Wibowo, A. (2023). Green innovation and financial performance: Evidence from Indonesian banking sector. *Journal of Sustainable Finance & Investment, 13*(2), 123-145.

Baron, R. M., & Kenny, D. A. (1986). The moderator-mediator variable distinction in social psychological research: Conceptual, strategic, and statistical considerations. *Journal of Personality and Social Psychology, 51*(6), 1173-1182. https://doi.org/10.1037/0022-3514.51.6.1173

BEI. (2023). *Statistik Saham dan Kepemilikan Bank 2023*. Bursa Efek Indonesia.

Birzhanova, Z., & Nurgaliyeva, A. (2022). Green banking: Evolution and global trends. *Central Asia and the Caucasus, 23*(4), 72–84.

Bose, S., Khan, H. Z., & Islam, S. (2018). Green Banking Disclosure and Firm Performance. *Journal of Cleaner Production*.

Bose, S., Khan, H. Z., & Monem, R. M. (2018). Does green banking performance pay off? Evidence from a unique regulatory setting in Bangladesh. *Corporate Governance: An International Review, 26*(6), 411-435.

BRI. (2023). *Laporan Tahunan 2023*. PT Bank Rakyat Indonesia (Persero) Tbk.

BSI. (2023). *Laporan Keberlanjutan Terintegrasi 2023*. PT Bank Syariah Indonesia Tbk.

Cahyaningtyas, S. R., Muhsyaf, S. A., & Husnaini, W. (2024). Environmental, Social, and Governance (ESG) disclosure and company performance: Empirical evidence in Indonesian banking. *Jurnal Ekonomi Akuntansi dan Manajemen, 23*(2), 134-158.

Chen, K., Zhao, S., Jiang, G., He, Y., & Li, H. (2025). The green innovation effect of the digital economy. *International Review of Economics and Finance, 99*, 103970. https://doi.org/10.1016/j.iref.2025.103970

Chen, L., et al. (2022). Green Credit and Bank Profitability. *Environmental Science and Pollution Research*.

Chouaibi, S., Chouaibi, J., & Rossi, M. (2022). ESG and corporate financial performance: the mediating role of green innovation: UK common law versus Germany civil law. *EuroMed Journal of Business, 17*(1), 46–71. https://doi.org/10.1108/EMJB-09-2020-0101

Cici, C., & D'Isanto, D. (2017). Integrating Sustainability into Your Core Business.

SYMPHONYA Emerging Issues in Management, n. 1, 2017, 1(1), 1–3. https://www.conference-board.org/retrievefile.cfm?filename=sustainability-rwg-project-brief.pdf&type=subsite

Del Sarto, G. (2025). Governance structures and ESG performance: Evidence from European banking. *Journal of Banking & Finance, 59*, 102-118.

Delia, A. R., & Sudrajad, O. Y. (2024). Enhancing sustainable banking practices: Implementing the BESGI framework to Indonesian banks. *International Journal of Current Science Research and Review, 7*(1), 551-560. https://doi.org/10.47191/ijcsrr/V7-i1-51

Deloitte, European Investment Bank, Global Alliance for Banking on Values, & KKS Advisors. (2020). *Do sustainable banks outperform? Driving value creation through ESG practices*. Retrieved from https://www2.deloitte.com/uk/en/pages/financial-services/articles/driving-value-creation-through-esg-practices.html

Dewi, S. (2023). Corporate governance and sustainable finance in Indonesian banks. *Indonesian Journal of Banking and Finance, 18*(2), 89-105.

DGIP. (2023). *Database Paten Hijau Indonesia*. Direktorat Jenderal Kekayaan Intelektual.

Dicuonzo, G., Fabbri, F., & Ricci, F. (2022). Corporate governance and sustainability in European banks: The moderating role of board diversity. *European Financial Management, 28*(4), 987-1012.

DiMaggio, P., & Powell, W. W. (1983). The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields. *American Sociological Review, 48*(2), 147-160.

Erben Yavuz, A., Kocaman, B. E., Doğan, M., Hazar, A., Babuşcu, Ş., & Sutbayeva, R. (2024). The Impact of Corporate Governance on Sustainability Disclosures: A Comparison from the Perspective of Financial and Non-Financial Firms. *Sustainability (Switzerland), 16*(19). https://doi.org/10.3390/su16198400

European Banking Authority. (2023). *EBA progress report on greenwashing monitoring and supervision*. EBA/REP/2023/16.

European Central Bank. (2022). *Supervisory assessment of institutions' climate-related and environmental risks disclosures*. ECB Banking Supervision.

European Parliament. (2022). *Corporate Sustainability Reporting Directive (CSRD)*. https://www.europarl.europa.eu/

EViews.com. (2024). *EViews 13 User's Guide*. IHS Global Inc. https://www.eviews.com/EViews13/EViews13.html

Faidilah, R. (2024). Institutional ownership and sustainability practices: Evidence from emerging markets. *Emerging Markets Finance and Trade, 60*(3), 234-251.

Faisal, F., & Nuryatno, M. A. (2023). Perkembangan Investasi Berkelanjutan Global dan Implikasinya bagi Indonesia. *Jurnal Ekonomi dan Kebijakan Publik, 10*(2), 150–165.

Fakhira, F., et al. (2023). *Laporan Stabilitas Sistem Keuangan 2023*. Otoritas Jasa Keuangan.

Fata, A., & Arifin, Z. (2024). The impact of green credit distribution on bank performance and influencing factors. *International Journal of Research in Business and Social Science (2146-7737), 13*(1), 318–327. https://doi.org/10.20525/ijrbs.v13i1.3185

Fauziah, F., Novita, N., & Fambudi, I. N. (2024). The role of institutional ownership in moderating ESG disclosure's impact on firm value. *Jurnal REKSA: Rekayasa Keuangan, Syariah dan Audit, 11*(2), 108–121. https://doi.org/10.12928/jreksa.v11i2.10534

Firmansyah, A., & Kartiko, N. D. (2024). Exploring the association of green banking disclosure and corporate sustainable growth: the moderating role of firm size and firm age. *Cogent Business and Management, 11*(1). https://doi.org/10.1080/23311975.2024.2312967

Fombrun, C. J. (1996). *Reputation: Realizing value from the corporate image*. Harvard Business School Press.

Freeman, R. E. (1984). *Strategic Management: A Stakeholder Approach*. Boston: Pitman.

Furqan, M., & Sutrisno, S. (2023). Green credit and risk management in Indonesian banks: An empirical analysis. *Asian Journal of Finance & Banking, 15*(3), 45-67.

Ghozali, I. (2018). *Aplikasi Analisis Multivariate Dengan Program IBM SPSS 25*. Semarang: Badan Penerbit Universitas Diponegoro.

GRI. (2021). *Global Reporting Initiative Standards*. Amsterdam: GRI.

Gujarati, D. N. (2021). *Econometrics by Example* (4th ed.). London: Palgrave Macmillan.

Halimatussadiah, A., Farahmita, A., Machmud, Z., Siregar, A. A., Iskandar, S. D., & Sholihah, N. K. (2018). Bankers' perception on the implementation of sustainable finance in Indonesia. *E3S Web of Conferences, 74*,

01002. https://doi.org/10.1051/e3sconf/20187401002

Handajani, L. (2019). Pengaruh Tata Kelola Perusahaan terhadap Pengungkapan Green Banking. *Jurnal Akuntansi dan Keuangan Indonesia, 16*(1), 1–15.

Handajani, R. (2019). Foreign ownership and sustainability practices in Indonesian banks. *International Journal of Economics and Business Research, 17*(4), 456-472.

Hastuti, D., & Kusumadewi, S. (2023). Building reputation through ESG disclosure: The Indonesian banking experience. *Corporate Social Responsibility and Environmental Management, 30*(2), 789-804.

Hastuti, T., & Kusumadewi, R. K. A. (2023). Pengaruh Green Banking Terhadap Nilai Perusahaan. *Reviu Akuntansi dan Bisnis Indonesia*.

Hastuti, T., & Rahmayati, D. (2022). Pengaruh Green Banking Disclosure terhadap Nilai Perusahaan. *Jurnal Akuntansi dan Keuangan, 24*(2), 123–135.

Hong, Z. (2025). Risks and prevention methods in green finance. *SHS Web of Conferences, 218*, 03018.

Hossain, M. R., Rao, A., Sharma, G. D., Dev, D., & Kharbanda, A. (2024). Empowering energy transition: Green innovation, digital finance, and the path to sustainable prosperity through green finance initiatives. *Energy Economics, 136*, 107736. https://doi.org/10.1016/j.eneco.2024.107736

IFC. (2023). *Sustainable Banking in Emerging Markets*. World Bank Group.

Irfany, M. I., Putri, F. I., & Haq, D. A. (2024). Exploring the impact of green financing on bank stability: Insights from Indonesian Islamic and conventional banks. *El Dinar: Jurnal Keuangan dan Perbankan Syariah, 12*(2), 228-245.

Judijanto, A., Wibowo, A., & Fadli, M. (2024). Greenwashing and reputation risk in Indonesian banks: Strategies for mitigation. *Journal of Financial Crime, 31*(1), 112-130.

Karn, I., Mendiratta, E., Fehre, K., & Oehmichen, J. (2023). The effect of corporate governance on corporate environmental sustainability: A multilevel review and research agenda. *Business Strategy and the Environment, 32*(6), 2926–2961. https://doi.org/10.1002/bse.3279

Kartika, D., et al. (2023). The Development of Green Banking Theory. *Interdisciplinary International Journal of Conservation and Culture, 1*(2), 1–10. https://doi.org/10.25157/iijcc.v1i2.3513

Kartika, D., Suparno, S., & Wahyuningsih, S. (2023). The development of green banking theory. *Interdisciplinary International Journal of Conservation and Culture, 1*(2), 1–10. https://doi.org/10.25157/iijcc.v1i2.3513

Karyani, N. L., & O'Brien, M. (2020). Green banking and financial performance: Evidence from Indonesia. *Journal of Sustainable Finance & Investment, 10*(4), 378–395.

Khamilia, N., & Nor, M. (2022). Sustainability Reporting Practices in Indonesian Banking Sector. *Jurnal Akuntansi dan Keuangan Indonesia, 19*(1), 45–60.

Khan, A., et al. (2021). Corporate Reputation and ESG Disclosure. *Journal of Business Ethics*.

Khan, M., Liu, Y., & Zhang, H. (2021). Corporate reputation and sustainability reporting: Evidence from emerging markets. *Journal of Business Ethics, 172*(2), 345-362.

KPMG. (2020). *Sustainable finance in Indonesia*. KPMG Indonesia. Retrieved from https://assets.kpmg.com/content/dam/kpmg/id/pdf/2020/06/id-sustainable-finance-in-indonesia.pdf

KPMG. (2022). *KPMG Survey of Sustainability Reporting 2022*. KPMG International.

KPMG. (2023). *Greenwashing danger in the banking sector: When the green coat crumbles*. KPMG International.

Li, Z., & Chen, P. (2024). Sustainable Finance Meets FinTech: Amplifying Green Credit's Benefits for Banks. *Sustainability, 16*(18), 7901. https://doi.org/10.3390/su16187901

Lin, C., Chen, Y., & Wang, S. (2025). Foreign ownership and ESG engagement: Evidence from Korean manufacturing firms. *Asia Pacific Journal of Management, 42*, 123-147.

Loissa, F. (2025). Green banking disclosure and financial performance in Indonesia: A critical analysis. *Journal of Indonesian Economics, 21*(1), 78-95.

Mandiri. (2023). *Laporan Keberlanjutan 2023*. PT Bank Mandiri (Persero) Tbk.

Marfuah, M., et al. (2025). Green Banking Practices in Indonesia. *Review of Integrative Business and Economics Research*.

Marfuah, N., Wibowo, A., & Fadli, M. (2025). Corporate governance and green finance: Evidence from Indonesian banks. *International Journal of Financial Studies, 13*(1), 89.

Maryanti, M., Abbas, M. H., Tenrisau, M. A., & Hasnidar, H. (2024). Banking sustainability

in Indonesia. *Journal of Legal Science and Sustainability, 2*(2), 134-156.

Meltwater. (2023). *Indonesia ESG Media Sentiment Report 2023*. Meltwater Asia Pacific.

Mir, A. A., & Bhat, A. A. (2022). Green banking and sustainability – a review. *Arab Gulf Journal of Scientific Research, 40*(3), 247 – 263. https://doi.org/10.1108/AGJSR-04-2022-0017

Mir, A. A., Bhat, A. A., Al-Adwan, A. S., Farooq, S., Jamali, D., & Malik, I. A. (2025). Green banking practices and customer satisfaction-way to green sustainability. *Innovation and Green Development, 4*(2). https://doi.org/10.1016/j.igd.2025.100221

Mujiani, N., & Nurfitri, A. (2020). Pengaruh Sustainability Reporting terhadap Kinerja Keuangan Perbankan. *Jurnal Akuntansi dan Keuangan, 22*(1), 45–58.

Naili, M., & Lahrichi, Y. (2022). Banks' credit risk, systematic determinants and specific factors: Recent evidence from emerging markets. *Heliyon, 8*(2), e08960.

Nasution, M. I., et al. (2024). Implementasi Perjanjian Paris dalam Kebijakan Lingkungan di Indonesia. *Jurnal Hukum Lingkungan Indonesia, 11*(1), 45–60.

Nguyen, K. Q. T. (2022). Corporate Social Responsibility and Bank's Performance under the Mediating Role of Customer Satisfaction and Bank Reputation. *Emerging Science Journal, 6*(6), 1409–1429. https://doi.org/10.28991/ESJ-2022-06-06-012

Nizam, E., Ng, A., Dewandaru, G., Nagayev, R., & Nkoba, M. A. (2022). The impact of green innovation on financial performance: Evidence from Asian banks. *Journal of Financial Innovation, 8*(1), 1-24.

Nizam, E., et al. (2022). Green Innovation and Firm Performance. *Journal of Cleaner Production*.

Nouaili, M., & Khemiri, M. A. (2025). Green growth, corporate social responsibility, and bank profitability: Synergies for sustainable finance in the Middle East and North Africa region. *International Journal of Economics and Financial Issues, 15*(4), 393-404.

Nursahla, R. S. A., Paramayoga, N., Muhammad Anas Fadli, & Muhammad Pravest Hamidi. (2023). Legal Aspects of the Central Bank'S Green Finance Instruments in Indonesia: an Overview. *Journal of Central Banking Law and Institutions, 2*(1), 123–152. https://doi.org/10.21098/jcli.v2i1.38

Odriozola, M. D., & Baraibar-Diez, E. (2017). Is corporate reputation associated with quality of CSR reporting? Evidence from Spain. *Corporate Social Responsibility and Environmental Management, 24*(2), 121-132. https://doi.org/10.1002/csr.1399

OECD. (2020). *Corporate Governance for Sustainability: Integrating Environmental, Social and Governance Factors into Corporate Strategy*. OECD Publishing.

OJK. (2014). *Roadmap keuangan berkelanjutan di Indonesia*. Jakarta: Otoritas Jasa Keuangan.

OJK. (2017). *Peraturan Otoritas Jasa Keuangan No. 51/POJK03/2017 tentang Keuangan Berkelanjutan*. Jakarta: Otoritas Jasa Keuangan.

OJK. (2023). *Laporan Perkembangan Keuangan Berkelanjutan*. Jakarta: Otoritas Jasa Keuangan.

Park, H., & Kim, J. D. (2020). Transition towards green banking: role of financial regulators and financial institutions. *Asian Journal of Sustainability and Social Responsibility, 5*(1). https://doi.org/10.1186/s41180-020-00034-3

Purkayastha, S. (2018). *Barriers to green energy financing in emerging markets: The case of Asia*. Asian Development Bank Economics Working Paper Series, No. 567.

Purwanto, E. (2025). The economic impact of fintech adaptation on sustainable banking performance: The role of green finance and innovation in Indonesia. *Journal of Economics Research and Policy Studies, 5*(1), 72-89. https://doi.org/10.53088/jerps.v5i1.1454

Puspaningsih, A., & Ristya, D. A. F. (2022). The Effects of Good Corporate Governance Mechanisms on Profitability of Company Shares. *Review of Integrative Business & Economics Research*.

Rachman, R. (2021). Green banking practices and financial performance: Evidence from Indonesia. *Banking & Finance Review, 13*(2), 45-60.

Rahman, A. F., et al. (2024). Mediating Role of Sustainability Reporting Quality. *Studia Universitatis Economics Series*.

Rahman, M. H., Rahman, J., Tanchangya, T., & Esquivias, M. A. (2023). Green banking initiatives and sustainability: A comparative analysis between Bangladesh and India. *Research in Globalization, 7*. https://doi.org/10.1016/j.resglo.2023.100184

Rahmamita, D., & Kahar, S. (2024). The effectiveness of green banking disclosure on bank profitability in Indonesia. *Indonesian Management Review, 15*(1), 67-82.

RepTrak. (2023). *Global RepTrak 100: The World's Most Reputable Companies*. RepTrak Company.

Ridho, T. K., & Vinichenko, M. V. (2024). Evaluation of sustainable finance implementation in emerging markets. *Journal of Policy and Society, 1*(1), 468.

Romli, R., & Zaputra, R. (2021). The effect of green banking on financial performance: Evidence from ASEAN countries. *International Journal of Energy Economics and Policy, 11*(3), 189–196.

SAP Fioneer. (2023). *The value of sustainability in banking: A global perspective*. SAP Fioneer Report. Retrieved from https://sapfioneer.com/reports/sustainability-2023

Sebastião, A. M., Tavares, M. C., & Azevedo, G. (2024). Evolution and Challenges of Sustainability Reporting in the Banking Sector: A Systematic Literature Review. *Administrative Sciences, 14*(12), 1–23. https://doi.org/10.3390/admsci14120333

Siahaan, C., Silalahi, A. S., Syahyunan, & Sianipar, A. S. (2021). Analysis of green banking sustainability and financial performance implementation towards profitability of banking listed on the Indonesia Stock Exchange in 2012-2018. *Journal of Management and Technology, 21*(1), 1-21.

Siswanti, I., Riyadh, H. A., Cahaya, Y. F., Prowanta, E., & Beshr, B. A. H. (2024). Unlocking sustainability: exploring the nexus of green banking, digital transformation, and financial performance with foreign ownership moderation. *Discover Sustainability, 5*(1). https://doi.org/10.1007/s43621-024-00597-5

Smuda-Kocoń, M. (2023). Reconfiguring the risk of financial organizations as a consequence of the green transition and a potential source of 'Green Swan events'. *Journal of Management and Financial Sciences, 16*(53), 85-102.

Sobel, M. E. (1982). Asymptotic confidence intervals for indirect effects in structural equation models. *Sociological Methodology, 13*, 290-312.

Tampikalih, S., & Syafri, S. (2025). The effect of green banking implementation and financial performance on the profitability of commercial banks in Indonesia. *Journal of Accounting and Finance Management, 6*(2), 784-790.

Tia, C., Hasnawati, S., & Faisol, A. (2023). The impact of green banking on profitability (Study on banking sector listed on Indonesia Stock Exchange (IDX) period 2016-2022). *International Journal of Asian Business and Management, 2*(6), 887-900.

Tiara, I. D., & Jayanti, D. M. (2023). Green Banking and Bank Stability: A Study in Indonesia. *Jurnal Ekonomi Pembangunan Indonesia, 23*(1), 1–15.

Ulfah, N., & Denta, R. (2025). Institutional ownership and sustainability reporting quality: Evidence from Indonesian banking. *Asian Review of Accounting, 33*(2), 145-162.

UNEP FI. (n.d.). *Global Trends in Sustainable Finance*. Nairobi: UNEP.

UNFCCC. (n.d.). *Paris Agreement*. Bonn: United Nations.

Veh, A., Göbel, M., & Vogel, R. (2018). Corporate reputation and innovation risk: The moderating effects of governance mechanisms. *Strategic Management Journal, 40*(12), 1987-2012.

Veh, A., Göbel, M., & Vogel, R. (2018). Corporate reputation in management research: A review of the literature and assessment of the concept. *Business Research, 11*(2), 338–383. https://doi.org/10.1007/s40685-017-0066-5

Venturelli, A., Furlan, A., & Bortoluzzi, G. (2024). Greenwashing and reputational risk: Strategies for banks. *Corporate Reputation Review, 27*(3), 245-262.

Wahyuditomo, F. (2024). Evaluation of the Implementation of the Green Banking Concept at Bank XYZ. *Eduvest - Journal of Universal Studies, 4*(1), 1–10.

Wahyuditomo, T. W. (2024). Evaluation of the implementation of the green banking concept at Bank XYZ. *Eduvest - Journal of Universal Studies, 4*(1), 110–119. https://doi.org/10.59188/eduvest.v4i1.1002

Wang, L., Li, X., & Zhang, Y. (2024). ESG performance and green innovation: Evidence from Chinese commercial banks. *Journal of Cleaner Production, 377*, 134-150.

Wang, Q., Zhang, Y., Li, Y., & Wang, P. (2024). ESG performance and green innovation in commercial banks: Evidence from China. *PLoS ONE, 19*(11), e0308513.

Wang, Y. Z., & Ahmad, S. (2024). Green process innovation, green product innovation, leverage, and corporate financial performance; evidence from system GMM. *Heliyon, 10*(4), e25819. https://doi.org/10.1016/j.heliyon.2024.e25819

Wanta, R., & Herawaty, R. (2021). Investor pressure and sustainability reporting: The

Indonesian banking sector. *Corporate Social Responsibility and Environmental Management, 28*(4), 1234-1247.

Wardani, I. A., Juanda, A., & Wicaksono, A. P. N. (2025). Structural ownership and ESG disclosure: Unveiling their impact on corporate financial performance. *Journal of Accounting and Investment, 26*(1), 124-145. https://doi.org/10.18196/jai.v26i1.24193

Widarjono, A., et al. (2024). Green Credit and Bank Stability. *Risks, 12*(3), 50.

Wiley. (2024). *Panel Data Econometrics with EViews*. Wiley Online Library. https://www.wiley.com/en-id/Panel+Data+Econometrics+with+EViews-p-9781119482116

World Bank. (2019). *Global progress report of the Sustainable Banking Network: Innovations in policy and industry actions in emerging markets*. International Finance Corporation.

Xia, Y., & Liu, Z. (2022). Competition and green innovation in banking: Evidence from China. *Technological Forecasting and Social Change, 177*, 121529.

Ye, J., & Dela, E. (2023). The effect of green investment and green financing on sustainable business performance of foreign chemical industries operating in Indonesia: The mediating role of corporate social responsibility. *Sustainability (Switzerland), 15*(14). https://doi.org/10.3390/su151411218

Yuspin, W., et al. (2024). Tantangan Implementasi Green Banking di Indonesia. *Jurnal Manajemen Strategik, 9*(1), 78–90.

Yusuf, M., Abduh, M. R., & Komarudin, P. (2025). Green banking concept: A systematic literature review. *Proceedings of International Conference on Multidisciplinary Studies for Social Development, 1*, 33-39.

Zhang, X., Wang, Z., Zhong, X., Yang, S., & Siddik, A. B. (2022). Do Green Banking Activities Improve the Banks' Environmental Performance? The Mediating Effect of Green Financing. *Sustainability (Switzerland), 14*(2). https://doi.org/10.3390/su14020989

Zhou, H., Chen, L., & Wang, J. (2024). Reputational effects of green finance in Indonesian banks. *Asian Journal of Sustainability, 10*(2), 89-105.

Zhou, X., et al. (2024). Green Finance and Bank Stability. *Journal of Environmental Management*.

Zimon, G., Arianpoor, A., & Salehi, M. (2022). Sustainability Reporting and Corporate Reputation: The Moderating Effect of CEO Opportunistic Behavior. *Sustainability (Switzerland), 14*(3), 1–28. https://doi.org/10.3390/su14031257