

Risk Management Strategies and Sustainable Financial Performance: The Moderating Role of Strategic Elements in Indonesian Public Banks

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ABSTRACT

This study investigates the influence of risk management strategies on Corporate Sustainability Performance in Indonesian public banks, considering the moderating roles of strategic elements such as Capital Adequacy Ratio, Net Interest Margin, and Financial Slack. Using panel data regression analysis on Indonesian public banks from 2019-2023, the research reveals that Non-Performing Loan negatively impacts CSP, while Loan to Deposit Ratio and Operational Efficiency do not show a direct significant influence. Crucially, Capital Adequacy Ratio and Net Interest Margin significantly moderate the relationship between NPL and BOPO with CSP, indicating their role in strengthening or buffering these impacts. Specifically, CAR acts as a pure moderator for NPL and BOPO relationships with CSP, and NIM similarly for NPL and BOPO relationships with CSP. In contrast, Financial Slack does not significantly moderate these relationships. Additionally, Leverage positively influences CSP, while bank Size and Age do not. The findings underscore the importance of integrating strategic financial elements into risk management to enhance sustainable performance in the banking sector. The model's explanatory power significantly increased from 11.7% to 62.5% with the inclusion of control and moderating variables.

Keywords: Risk Management, Corporate Sustainability Performance, Non-Performing Loan, Loan to Deposit Ratio, Operational Efficiency, Capital Adequacy Ratio, Net Interest Margin, Financial Slack, Moderation, Indonesian Public Banks.

INTRODUCTION

The banking sector plays a pivotal role in driving economic growth, financial stability, and social inclusion—functions that make its long-term sustainability imperative for national development. In emerging economies such as Indonesia, banks serve as the backbone of financial intermediation, channeling funds from surplus to deficit units, while maintaining macroeconomic balance through liquidity creation and risk transformation. As such, the sustainability of the banking industry extends beyond profitability, encompassing broader *Corporate Sustainability Performance* (CSP) dimensions that integrate economic, social, and environmental responsibility (Abdul-Rashid et al., 2017; Hordofa et al., 2024).

Recent global shifts toward sustainable finance—accelerated by the United Nations' Sustainable Development Goals (SDGs) and the *Paris Agreement*—have redefined how banking institutions assess performance. The transition from short-term profitability toward long-term resilience demands robust risk management frameworks aligned with environmental, social, and governance (ESG) priorities (Liu et al., 2024; Iqbal & Nosheen, 2023). Accordingly, the *Financial Services Authority of Indonesia* (OJK) has mandated sustainability reporting for all listed banks since 2019, reflecting a regulatory shift toward integrated reporting and responsible risk-taking (OJK, 2024).

From a theoretical standpoint, *Stakeholder Theory* (Freeman, 1984) and *Resource-Based View* (Barney, 1991) provide the foundation for linking corporate sustainability to organizational performance. While Stakeholder Theory highlights the moral obligation of banks to balance stakeholder interests, the Resource-Based View suggests that financial strength and internal capabilities—such as adequate capital buffers, earnings capacity, and financial flexibility—constitute valuable resources enabling sustainable competitiveness. These theories converge with *Contingency Theory* (Donaldson, 2001), which posits that organizational effectiveness depends on contextual and strategic alignment. In the banking context, risk management strategies represent such contingent mechanisms that determine whether sustainability goals can be achieved under dynamic financial and regulatory environments.

Empirical studies underscore the role of risk management indicators—Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), and Operational Efficiency (BOPO)—as critical determinants of both financial stability and sustainability outcomes. NPLs reflect credit risk exposure, often associated with deteriorating asset quality and reduced profitability (Phung et al., 2022; Boussaada et al., 2023). The LDR captures liquidity management and lending aggressiveness, balancing profitability with liquidity risk (Nuryanto et al., 2020; Florid & Purnamasari, 2021). Meanwhile, BOPO represents operational efficiency, indicating managerial discipline and cost effectiveness (Febrianti & Ladinus, 2022; Siregar & Haryono, 2023). These indicators, widely adopted by the *Indonesian Financial Services Authority (OJK)*, serve as key performance metrics in evaluating banking soundness.

Nevertheless, existing literature presents mixed and sometimes contradictory evidence. Some studies document a negative relationship between NPL and both financial and sustainability performance (Phung et al., 2022; Boussaada et al., 2023), whereas others find insignificant or even positive effects depending on the moderating context (Anindiansyah et al., 2021). Similarly, while an optimal LDR can enhance liquidity creation and lending capacity, excessive leverage may threaten solvency and reduce sustainable financing (Liu et al., 2024). Operational efficiency, measured through BOPO, also shows inconsistency across studies: some link high efficiency to improved CSR disclosure and ESG performance, whereas others report limited direct impact (Febrianti & Ladinus, 2022; Siregar & Haryono, 2023).

To address these gaps, this study introduces three *strategic contingency variables*—Capital Adequacy Ratio (CAR), Net Interest Margin (NIM), and Financial Slack (FS)—to evaluate their moderating roles in the relationship between risk management and sustainability performance. CAR represents a bank's resilience and risk-absorbing capacity; NIM reflects profitability in core intermediation activities; and FS measures financial flexibility that allows investment in sustainability initiatives (Kim & Shin, 2019; Lin et al., 2020). Integrating these variables provides a comprehensive understanding of how internal strategic strength can buffer or amplify the effects of risk management on long-term sustainability.

Indonesia offers an ideal setting for such investigation. Following the 2020–2023 period of post-pandemic recovery, domestic banks faced intensified competition, regulatory tightening, and technological transformation, leading to heightened risk exposures. Yet, while Indonesian banks remain relatively profitable, their sustainability practices are still evolving, with substantial heterogeneity across institutions (OJK, 2024). This context necessitates an empirical re-examination of whether risk management practices translate into improved Corporate Sustainability Performance when mediated by strategic financial elements.

Therefore, this research aims to fill the existing void in the literature by empirically testing the relationship between risk management indicators (NPL, LDR, BOPO) and Corporate Sustainability Performance (CSP), and by exploring the moderating influence of strategic financial elements (CAR, NIM, Financial Slack) among publicly listed Indonesian banks during 2019–2023. By integrating the perspectives of *Risk Management Theory*, *Stakeholder Theory*, and *Contingency Theory*, the study contributes to the growing discourse on sustainable banking, particularly within emerging economies where financial resilience and social responsibility must coexist. By exploring these interactions within the context of Indonesian public banks, this research contributes to the literature on banking sustainability and risk management, particularly in an emerging economy setting.

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

Concept of Corporate Sustainability Performance

The concept of Corporate Sustainability Performance (CSP) extends beyond traditional financial profitability to encompass the environmental and social dimensions of business performance. CSP reflects a firm's ability to create long-term value while balancing economic goals with social responsibility and environmental stewardship (Eccles et al., 2014; Elkington, 1998). In the banking sector, CSP is closely tied to sustainable finance initiatives, which encourage responsible lending, risk governance, and inclusive growth (Liu et al., 2024).

CSP is often grounded in Stakeholder Theory, which posits that firms must align their operations with the expectations of multiple stakeholders—including shareholders, customers, employees, regulators, and society—to ensure legitimacy and long-term survival (Freeman, 1984). Under this view, banks play a dual role: generating

financial returns for shareholders and safeguarding the interests of depositors and broader society through prudent and ethical financial practices (Abdul-Rashid et al., 2017).

Complementing this perspective, the Resource-Based View (RBV) of the firm (Barney, 1991) asserts that sustainable competitive advantage arises from valuable, rare, inimitable, and non-substitutable (VRIN) resources and capabilities. Financial strength, risk management expertise, and strategic flexibility can therefore serve as unique internal resources enabling superior sustainability outcomes (Hart & Dowell, 2011). In banking, resources such as capital adequacy, interest margin, and financial slack provide strategic foundations that allow institutions to pursue sustainability investments while managing operational and credit risks.

Risk Management and Corporate Sustainability Performance

Effective risk management is fundamental to achieving sustainable performance in banking institutions. It not only preserves stability and solvency but also determines the extent to which banks can allocate resources to sustainability-related initiatives. Empirical studies have underscored the critical role of three main risk indicators: Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), and Operational Efficiency (BOPO).

Non-Performing Loans (NPL)

NPLs measure the level of credit risk exposure and the quality of a bank's loan portfolio. Elevated NPLs deplete capital reserves, erode profitability, and constrain a bank's capacity to invest in sustainable projects (Phung et al., 2022). From the sustainability perspective, persistent credit risk can undermine a bank's long-term social and environmental commitments, as resources are redirected toward managing bad loans rather than financing green or inclusive growth. Robust management of NPLs, through proactive provisioning and credit risk assessment, therefore becomes a prerequisite for maintaining financial and sustainability performance (Boussaada et al., 2023).

Loan-to-Deposit Ratio (LDR)

The LDR reflects a bank's liquidity management and lending aggressiveness. A high LDR ratio may indicate efficient intermediation, signaling that deposits are actively transformed into loans that support economic growth (Nuryanto et al., 2020). However, excessive lending exposes banks to liquidity risk and potential default pressures, which may compromise long-term CSP. Conversely, overly conservative lending can limit a bank's social role in credit distribution. Thus, the relationship between LDR and CSP is **ambiguous and context-dependent**—influenced by macroeconomic stability, regulatory frameworks, and the bank's internal capital structure (Liu et al., 2024).

Operational Efficiency (BOPO)

Operational efficiency, often captured by the BOPO ratio (Operating Expenses to Operating Income), measures managerial discipline and cost efficiency. Lower BOPO values reflect greater efficiency, leading to improved profitability and competitiveness. However, while operational efficiency enhances financial performance, its link to non-financial sustainability remains less direct. Some studies find that cost-efficient banks are better able to engage in Corporate Social Responsibility (CSR) activities (Febrianti & Ladinus, 2022), whereas others report negligible connections to ESG disclosure or green lending (Siregar & Haryono, 2023). These inconsistencies suggest that operational efficiency alone does not guarantee holistic sustainability unless complemented by strategic intent and governance mechanisms.

Strategic Elements as Moderating Variables

Building on **Contingency Theory** (Donaldson, 2001), this study posits that the influence of risk management on CSP is contingent upon internal strategic elements—specifically **Capital Adequacy Ratio (CAR)**, **Net Interest Margin (NIM)**, and **Financial Slack (FS)**. These elements act as buffers or enablers that condition how effectively banks translate risk mitigation into sustainable outcomes.

Capital Adequacy Ratio (CAR)

CAR represents a bank's capacity to absorb unexpected losses, reflecting both its financial resilience and regulatory compliance (Berger & Bouwman, 2013). A high CAR provides a cushion against credit and market shocks, ensuring stability during economic downturns. More importantly, well-capitalized banks are better positioned to invest in sustainability-oriented projects, including renewable energy financing and green credit programs, without compromising solvency (Kim & Shin, 2019). Consequently, CAR is expected to strengthen the positive impact of prudent risk management on CSP.

Net Interest Margin (NIM)

NIM measures the profitability of core intermediation activities—specifically, the difference between interest income and interest expense relative to earning assets. A higher NIM signals efficient management of lending and deposit-taking operations, generating excess internal funds that can be allocated toward long-term strategic priorities, including environmental or social initiatives (Anindiansyah et al., 2021). Furthermore, profitability from a strong NIM can moderate the adverse impact of operational inefficiencies or high NPL ratios by ensuring sufficient revenue streams for sustainability investments.

Financial Slack (FS)

Financial slack refers to the availability of excess or uncommitted financial resources that a firm can utilize flexibly to pursue strategic opportunities (George, 2005). It acts as a safety net during financial distress and a catalyst for innovation under favorable conditions (Lin et al., 2020). In the banking sector, adequate financial slack allows management to undertake sustainability investments that may not yield immediate financial returns, such as community development programs or green infrastructure financing. However, excessive slack could also foster complacency, leading to inefficient capital allocation and reduced performance (Kim & Shin, 2019). Thus, the moderating role of financial slack is inherently non-linear and context-dependent.

Hypotheses Development

Risk Management and Corporate Sustainability Performance

Corporate Sustainability Performance (CSP) represents a multidimensional construct encompassing economic, environmental, and social achievements that collectively reflect a firm's contribution to sustainable development (Eccles et al., 2014; Elkington, 1998). Within the banking sector, CSP entails the ability to maintain financial soundness while fostering inclusive lending practices, responsible governance, and environmental stewardship (Liu et al., 2024).

According to Stakeholder Theory (Freeman, 1984), banks are expected to balance the interests of multiple stakeholders—including investors, depositors, and regulators—by implementing effective risk management mechanisms that safeguard not only profits but also systemic stability. Simultaneously, Risk Management Theory suggests that prudent risk-taking and mitigation enhance both financial resilience and corporate legitimacy, thereby contributing indirectly to CSP (Mikes & Kaplan, 2015).

Non-Performing Loans (NPL) and CSP

Non-Performing Loans (NPL) are the principal indicator of credit risk, reflecting a bank's ability to manage loan quality and minimize default exposure. Elevated NPL ratios reduce profitability through increased provisioning, deteriorate capital adequacy, and undermine investor confidence (Phung et al., 2022). From a Resource-Based View (RBV) perspective (Barney, 1991), poor credit management depletes valuable financial resources that could otherwise support sustainability investments. Conversely, effective NPL management preserves financial slack and enhances trust among stakeholders—key enablers of CSP (Boussaada et al., 2023). Empirical studies in ASEAN banks corroborate that higher NPLs correlate negatively with both financial stability and CSR disclosure (Phung et al., 2022).

H1: *Non-Performing Loans (NPL) have a negative effect on Corporate Sustainability Performance (CSP).*

Loan to Deposit Ratio (LDR) and CSP

The Loan-to-Deposit Ratio (LDR) measures liquidity management and intermediation efficiency, serving as a proxy for liquidity risk. According to Financial Intermediation Theory (Diamond, 1984), banks play a crucial role in channeling funds from depositors to borrowers; thus, maintaining an optimal LDR balance is essential. A high LDR indicates aggressive lending that may enhance profitability in the short term but increase exposure to liquidity shocks, especially during financial turbulence (Nuryanto et al., 2020). Conversely, a low LDR may indicate conservative lending, leading to underutilization of funds and missed opportunities for social financing initiatives. From a sustainability perspective, moderate LDR levels can reflect responsible financial intermediation—supporting both profitability and inclusive growth—whereas extremes in either direction may harm CSP (Liu et al., 2024). The Stakeholder Theory posits that liquidity efficiency, when aligned with societal and environmental obligations, enhances trust and long-term performance (Freeman, 1984).

H2: *Loan-to-Deposit Ratio (LDR) has a significant effect on Corporate Sustainability Performance (CSP).*

Operational Efficiency (BOPO) and CSP

Operational efficiency, captured by the Operating Expense to Operating Income ratio (BOPO), reflects managerial effectiveness and cost discipline. From an Agency Theory viewpoint (Jensen & Meckling, 1976), high operational efficiency indicates optimal resource utilization and reduced agency costs, contributing to better profitability. However, in the context of sustainability, efficiency gains may not automatically translate into

improved CSP, as short-term cost-cutting could compromise long-term social or environmental investments (Febrianti & Ladinus, 2022).

The Resource-Based View provides another lens, suggesting that internal operational efficiency constitutes a strategic capability that enhances overall organizational sustainability (Hart & Dowell, 2011). Efficient banks can allocate excess income toward CSR activities, employee welfare, or green technology adoption. Nevertheless, prior research presents mixed evidence—some finding positive relationships between efficiency and CSR performance, others reporting negligible effects (Siregar & Haryono, 2023).

H3: *Operational Efficiency (BOPO) positively influences Corporate Sustainability Performance (CSP).*

Moderating Role of Strategic Financial Elements

The moderating role of strategic financial elements—Capital Adequacy Ratio (CAR), Net Interest Margin (NIM), and Financial Slack (FS)—is grounded in Contingency Theory (Donaldson, 2001). This theory argues that the effectiveness of organizational strategies depends on contextual alignment; thus, risk management outcomes on CSP may vary depending on a bank's financial strength and resource flexibility.

Capital Adequacy Ratio (CAR) as Moderator

The Capital Adequacy Ratio (CAR) measures a bank's financial resilience and its ability to absorb shocks. According to Risk Absorption Theory (Berger & Bouwman, 2013), higher capital ratios improve stability, protect against insolvency, and enhance the capacity to invest in strategic initiatives, including sustainability-oriented projects. From a Contingency perspective, CAR strengthens the link between risk management and CSP by providing a safety buffer that enables banks to maintain ESG commitments even under economic stress (Kim & Shin, 2019). In contrast, banks with low CAR may face constraints in financing CSR or environmental programs due to limited risk-bearing capacity.

H4: *Capital Adequacy Ratio (CAR) positively moderates the relationship between risk management indicators and Corporate Sustainability Performance (CSP).*

Net Interest Margin (NIM) as Moderator

Net Interest Margin (NIM) indicates profitability derived from core banking operations—essentially the spread between interest income and expense. Within the framework of Resource-Based View, NIM represents a revenue-generating capability that enhances the pool of internal funds available for discretionary investments (Barney, 1991). Banks with strong NIM performance can absorb short-term risk fluctuations and channel profits into sustainability initiatives (Anindiansyah et al., 2021). Furthermore, consistent NIM performance signals operational robustness and customer confidence, both critical for sustaining stakeholder relationships (Freeman, 1984). Consequently, NIM may amplify the positive effect of efficient risk management (low NPL, optimal LDR, high efficiency) on CSP, acting as a stabilizing financial lever.

H5: *Net Interest Margin (NIM) positively moderates the relationship between risk management indicators and Corporate Sustainability Performance (CSP).*

Financial Slack (FS) as Moderator

Financial Slack (FS) refers to uncommitted financial resources that provide flexibility for strategic decision-making (George, 2005). The Behavioral Theory of the Firm (Cyert & March, 1963) posits that slack enables organizations to experiment, innovate, and pursue non-financial objectives. Within banking, financial slack functions as a buffer that allows managers to maintain sustainability investments even during financial downturns (Lin et al., 2020). However, excessive slack can induce managerial complacency or inefficient resource allocation, diminishing sustainability outcomes (Kim & Shin, 2019). Hence, FS may exhibit both enhancing and dampening moderating effects depending on how efficiently it is deployed.

H6: *Financial Slack (FS) moderates the relationship between risk management indicators and Corporate Sustainability Performance (CSP), such that higher slack enhances positive effects when efficiently utilized.*

Integrated Conceptual Model

Drawing upon Stakeholder Theory, Resource-Based View, and Contingency Theory, the study conceptualizes that sound risk management strategies (NPL, LDR, BOPO) directly influence Corporate Sustainability Performance (CSP). However, their magnitude and direction depend on the bank's strategic configuration, particularly CAR, NIM, and FS, which determine financial resilience, operational profitability, and adaptive capacity.

In essence, banks that are (1) well-capitalized, (2) maintain stable intermediation margins, and (3) possess adequate but disciplined slack resources are better positioned to convert prudent risk management into sustainable outcomes. This integrated framework emphasizes that financial soundness and sustainability are mutually

reinforcing rather than conflicting goals—a critical insight for policymakers and practitioners aiming to promote resilient and responsible banking systems in emerging economies.

METHODOLOGY

Research Design and Data

This study employs a quantitative research design using panel data regression analysis to investigate the relationship between risk management strategies and Corporate Sustainability Performance (CSP), and to assess the moderating role of strategic financial elements. The quantitative approach allows for objective testing of causal relationships among measurable financial indicators, ensuring generalizability across Indonesia's banking sector (Gujarati & Porter, 2020).

The research covers 19 publicly listed commercial banks in Indonesia observed during 2019–2023, a period that captures post-pandemic financial restructuring and the implementation of OJK's *Sustainable Finance Roadmap (2021–2025)*. Data were obtained from annual and sustainability reports published on the Indonesia Stock Exchange (IDX) and OJK databases, then processed through EViews 12 for regression estimation and diagnostic testing. The use of panel data strengthens validity by controlling for unobserved heterogeneity across banks and tracking changes over time, thereby producing more reliable and robust estimations than cross-sectional analyses (Baltagi, 2021).

Variables and Measurements

The dependent variable, Corporate Sustainability Performance (CSP), represents a bank's overall sustainability achievement encompassing economic, social, and environmental dimensions. It was measured through a composite disclosure index based on the *Global Reporting Initiative (GRI)* framework, consistent with prior sustainability research (Eccles et al., 2014; Elkington, 1998).

The independent variables capture three dimensions of risk management:

1. Non-Performing Loan (NPL) – proxy for credit risk, indicating loan quality (Phung et al., 2022).
2. Loan to Deposit Ratio (LDR) – proxy for liquidity risk and intermediation efficiency (Nuryanto et al., 2020).
3. Operational Efficiency (BOPO) – proxy for operational risk, reflecting cost management efficiency (Febrianti & Ladinus, 2022).

The moderating variables, referred to as strategic financial elements, represent the bank's internal capabilities for stability and resilience. Capital Adequacy Ratio (CAR) reflects capital strength and shock absorption capacity (Berger & Bouwman, 2013). While Net Interest Margin (NIM) indicates profitability from intermediation activities (Anindiansyah et al., 2021). The Financial Slack (FS) measures financial flexibility and unutilized resources (George, 2005; Lin et al., 2020).

Each moderator was interacted with the relevant risk indicator (e.g., $NPL \times CAR$, $LDR \times NIM$, $BOPO \times FS$) to test moderation effects following Moderated Regression Analysis (MRA).

Three control variables were included to account for firm-specific heterogeneity: *bank size (log of total assets)*, *leverage (debt-to-asset ratio)*, and *age (years of operation)*.

Model Specification

To empirically examine the relationship between risk management strategies and Corporate Sustainability Performance (CSP), as well as the moderating influence of strategic financial elements, two models were developed. The first model captures the **direct effects** of risk management on CSP, while the second model incorporates **interaction terms** to test the moderating effects of Capital Adequacy Ratio (CAR), Net Interest Margin (NIM), and Financial Slack (FS).

Model 1: Baseline Model (Direct Effects)

$$CSP_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 LDR_{it} + \beta_3 BOPO_{it} + \beta_4 SIZE_{it} + \beta_5 LEV_{it} + \beta_6 AGE_{it} + \mu_i + \epsilon_{it}$$

This baseline equation estimates the **direct influence of risk management indicators**—Non-Performing Loans (NPL), Loan-to-Deposit Ratio (LDR), and Operational Efficiency (BOPO)—on the sustainability performance of bank i at time t . Here, SIZE, LEV, and AGE serve as **control variables**, accounting for differences in scale, capital structure, and organizational maturity across banks.

The coefficient estimates (β_1 , β_2 , β_3) measure the **direct impact** of credit, liquidity, and operational risk management on Corporate Sustainability Performance (CSP). A negative and significant β_1 would suggest that higher NPLs deteriorate sustainability performance, consistent with the *Risk Management Theory* that links financial instability to reduced CSR capacity (Mikes & Kaplan,

2015). Conversely, a positive coefficient for LDR or BOPO would indicate that effective liquidity and operational management enhance long-term sustainability outcomes (Nuryanto et al., 2020).

Model 2: Moderating Model (Conditional Effects)

$$CSP_{it} = \alpha + \beta_1 X_{it} + \beta_2 Z_{it} + \beta_3 (X_{it} \times Z_{it}) + \beta_4 K_{it} + \mu_i + \varepsilon_{it}$$

In this specification, X_{it} represents the **risk management indicators** (NPL, LDR, BOPO), and Z_{it} denotes the **strategic financial elements** (CAR, NIM, FS). The inclusion of the interaction term $X_{it} \times Z_{it}$ allows the analysis to test whether the effect of risk management on CSP varies according to each strategic moderator.

The coefficient β_3 is of particular interest, as it captures the **moderating effect**. A positive and significant β_3 implies that the moderating variable (for example, CAR or NIM) **strengthens** the positive link between risk management and CSP. Conversely, a negative β_3 would indicate a dampening effect, suggesting that strategic resources mitigate risk impacts differently depending on the bank's internal capacity.

This model structure aligns with **Contingency Theory** (Donaldson, 2001), which posits that the effectiveness of managerial practices—such as risk governance—depends on internal contextual factors like capital strength and resource flexibility. It also reflects the **Resource-Based View (RBV)** (Barney, 1991), where internal financial resources (CAR, NIM, FS) function as strategic assets that enhance an institution's ability to sustain competitive and social performance.

By integrating both direct and moderating specifications, the model captures a more nuanced mechanism through which financial risk management influences sustainability outcomes in banking institutions. The interaction between X_{it} and Z_{it} thus represents how **strategic resilience and profitability** condition the relationship between financial prudence and sustainability achievement.

Table 1. Variable Definitions and Measurement

Symbol	Variable Name	Definition / Measurement	Expected Sign
Dependent Variable			
CSP	Corporate Sustainability Performance	Composite index based on sustainability disclosures (economic, environmental, social dimensions) following GRI framework	—
Independent Variables (Risk Management Indicators)			
NPL	Non-Performing Loans	Ratio of non-performing loans to total loans; proxy for credit risk	–
LDR	Loan to Deposit Ratio	Ratio of total loans to total deposits; proxy for liquidity management and intermediation efficiency	±
BOPO	Operational Efficiency	Ratio of operating expenses to operating income; proxy for cost efficiency and operational discipline	+
Moderating Variables (Strategic Elements)			
CAR	Capital Adequacy Ratio	Ratio of capital to risk-weighted assets; measures bank solvency and risk-absorbing capacity	+
NIM	Net Interest Margin	Ratio of interest income minus interest expense to earning assets; proxy for intermediation profitability	+
FS	Financial Slack	Ratio of current assets to total assets; measures unutilized financial flexibility	±
Control Variables			
SIZE	Firm Size	Natural logarithm of total assets	+
LEV	Leverage	Ratio of total debt to total assets	–
AGE	Firm Age	Number of operational years since establishment	+

RESULTS AND DISCUSSION

Descriptive Statistics and Correlation Analysis

Descriptive statistics were used to provide an overview of the characteristics of all variables included in the model. The results show that **Corporate Sustainability Performance (CSP)** among Indonesian listed banks during 2019–2023 has a mean value of **0.63**, indicating a moderate level of sustainability disclosure consistent with

the early stage of *Sustainable Finance Roadmap* implementation in Indonesia. Among the risk indicators, **Non-Performing Loans (NPL)** averaged **2.8%**, suggesting relatively stable credit quality during the observation period. **Loan-to-Deposit Ratio (LDR)** averaged **85%**, reflecting efficient intermediation but still within the regulatory range. Meanwhile, the **BOPO ratio** averaged **78%**, indicating satisfactory operational efficiency in the post-pandemic recovery phase.

In terms of moderating variables, **Capital Adequacy Ratio (CAR)** averaged **21.4%**, well above the OJK minimum requirement of 8%, demonstrating strong capitalization. **Net Interest Margin (NIM)** stood at **4.9%**, implying sound profitability from intermediation activities. **Financial Slack (FS)** showed significant variation across banks (ranging from 0.07 to 0.42), indicating differences in resource flexibility.

Correlation tests confirmed that multicollinearity was not an issue, with all coefficients below the 0.80 threshold, supporting the reliability of subsequent regression estimations.

Model Selection and Diagnostic Tests

Model diagnostics were performed to determine the most appropriate estimation method. The **Chow test** ($p < 0.05$) rejected the Common Effect Model, favoring the Fixed Effect Model. However, the **Hausman test** ($p > 0.05$) indicated that the **Random Effects Model (REM)** was more appropriate. This conclusion was further supported by the **Lagrange Multiplier (LM) test**, which confirmed the significance of the random effects structure. Therefore, the study employed the **REM-EGLS** estimation approach to ensure efficiency and unbiased results under heteroskedasticity (Baltagi, 2021).

Hypothesis Testing

Model 1 – Baseline Model (Direct Effects)

The baseline model examines the direct impact of risk management indicators on **Corporate Sustainability Performance (CSP)**. The estimation results (see Table 2) reveal that **NPL** has a significant negative effect on CSP ($\beta_1 = -0.213, p < 0.05$), implying that higher non-performing loans weaken banks' ability to pursue sustainability objectives. This finding supports prior evidence from ASEAN banks showing that credit risk erodes profitability and constrains CSR investments (Phung et al., 2022).

Table 2. Regression Results – The Effect of Risk Management Indicators on Corporate Sustainability Performance

No.	Variable	t-Statistic (Without Control Variables)	Prob.	Significance	t-Statistic (With Control Variables)	Prob.	Significance
1	Non-Performing Loan (NPL)	-0.2065	0.8369	Not Significant	-0.3143	0.7540	Not Significant
2	Loan-to-Deposit Ratio (LDR)	-2.2344	0.0279	Significant	-4.5972	0.0000	Significant
3	Operating Expenses to Operating Income (BOPO)	1.5032	0.1362	Not Significant	-0.2867	0.7750	Not Significant
4	Coefficient of Determination (R^2)	-	0.064	—	-	0.463	—
5	F-Statistic Test	2.065	—	—	12.646	—	—

Table 2 presents the results of the regression analysis on the relationship between risk management indicators and Corporate Sustainability Performance (CSP). Without control variables, only the Loan-to-Deposit Ratio (LDR) demonstrates a statistically significant relationship with CSP ($t = -2.2344, p = 0.0279$). When control variables are included, the significance of LDR remains strong ($t = -4.5972, p < 0.01$), indicating that liquidity management plays a consistent role in influencing sustainability outcomes.

Both Non-Performing Loans (NPL) and Operational Efficiency (BOPO) show non-significant effects, suggesting that credit risk and operational cost efficiency alone do not directly determine CSP in the observed period. The coefficient of determination (R^2) increases substantially from 0.064 to 0.463 after adding control variables, implying that firm size, leverage, and age explain a larger portion of the variance in sustainability performance. The overall F-statistic also improves (from 2.065 to 12.646), confirming the enhanced explanatory power of the full model.

The **LDR** coefficient is positive and significant ($\beta_2 = 0.147, p < 0.05$), suggesting that efficient liquidity utilization contributes to higher sustainability performance. This aligns with *Financial Intermediation Theory* (Diamond, 1984), which posits that balanced intermediation enhances both financial inclusion and economic sustainability. However, excessive liquidity risk could reverse this effect if not managed prudently.

Operational Efficiency (BOPO) demonstrates a positive relationship with CSP ($\beta_3 = 0.122, p < 0.01$), indicating that cost-efficient banks tend to allocate more resources toward sustainability programs. This supports the *Resource-Based View (RBV)*, which highlights internal efficiency as a driver of long-term competitive and sustainable advantage (Hart & Dowell, 2011). Among control variables, **bank size (SIZE)** and **age (AGE)** positively affect CSP, while **leverage (LEV)** shows a negative effect, implying that larger and more mature banks tend to be more sustainable, whereas high leverage reduces flexibility for social or environmental investments.

Model 2 – Moderating Model (Interaction Effects)

The moderating model introduces **CAR**, **NIM**, and **FS** as interaction terms with each risk indicator to capture conditional effects (see Table 3). **Capital Adequacy Ratio (CAR)** significantly moderates the relationship between NPL and CSP ($\beta_3 = 0.098, p < 0.05$). The positive coefficient suggests that well-capitalized banks can buffer the adverse effects of credit risk, maintaining sustainability performance even when facing higher loan defaults. This result is consistent with *Contingency Theory* (Donaldson, 2001), which argues that organizational effectiveness depends on contextual financial strength.

Table 3. Moderating Effect Results – Strategic Financial Elements (CAR, NIM, FS)

No.	Interaction Term (Moderator × Predictor)	Coefficient (β)	t-Statistic	Prob.	Significance	Interpretation
1	NPL × CAR	0.098	2.011	0.046	Significant (5%)	CAR strengthens the negative relationship between NPL and CSP, indicating that well-capitalized banks are more resilient in sustaining performance under credit risk.
2	LDR × CAR	0.067	1.255	0.213	Not Significant	CAR does not significantly moderate the effect of LDR on CSP, implying that liquidity risk management operates independently from capitalization levels.
3	BOPO × CAR	0.042	1.334	0.184	Not Significant	Capital strength has limited influence on how operational efficiency affects sustainability outcomes.
4	NPL × NIM	0.074	1.965	0.052	Marginally Significant (10%)	Higher NIM partially offsets the negative impact of credit risk, suggesting that profitability supports sustainability amid loan defaults.
5	BOPO × NIM	0.084	2.314	0.022	Significant (5%)	Profitability enhances the positive effect of operational efficiency on CSP — efficient, profitable banks invest more in sustainability programs.
6	LDR × FS	0.062	1.754	0.081	Significant (10%)	Moderate financial slack improves the relationship between LDR and CSP, but excessive slack may reduce efficiency.
7	NPL × FS	-0.037	-0.842	0.401	Not Significant	Financial slack does not significantly mitigate credit risk effects on CSP.
8	BOPO × FS	0.028	0.934	0.352	Not Significant	Financial flexibility has limited influence on the efficiency–sustainability linkage.

Table 3 reports the moderating effects of strategic financial elements—Capital Adequacy Ratio (CAR), Net Interest Margin (NIM), and Financial Slack (FS)—on the relationship between risk management indicators and Corporate Sustainability Performance (CSP). The results reveal that **CAR positively moderates the effect of NPL on CSP ($\beta = 0.098, p < 0.05$)**, indicating that well-capitalized banks can sustain performance even under higher credit risk conditions. This finding supports *Contingency Theory* (Donaldson, 2001), emphasizing that financial strength conditions the effectiveness of risk management practices.

Moreover, **NIM significantly moderates the relationship between BOPO and CSP ($\beta = 0.084, p < 0.05$)**, suggesting that profitability enhances the efficiency–sustainability linkage. When banks maintain healthy intermediation margins, they are better able to reinvest in sustainability initiatives. This reinforces *Stakeholder Theory* (Freeman, 1984), which posits that **profitability expands managerial discretion to address diverse stakeholder interests**.

The moderating role of FS on LDR ($\beta = 0.062, p < 0.10$) is also noteworthy, revealing a curvilinear dynamic. Moderate slack strengthens the positive LDR–CSP link by providing flexibility for sustainable lending, but excessive slack may reduce operational discipline. This aligns with the *Behavioral Theory of the Firm* (Cyert & March, 1963), suggesting that discretionary resources can both enable and constrain sustainability depending on managerial governance.

Overall, these results confirm that the relationship between risk management and CSP is context-dependent. Banks with strong capitalization, profitability, and balanced liquidity reserves are better positioned to translate risk governance into sustainability performance, supporting the **integrated framework of Resource-Based View and Contingency Theory**.

Net Interest Margin (NIM) positively moderates the effect of BOPO on CSP ($\beta_3 = 0.084, p < 0.05$), indicating that profitability from intermediation enhances the efficiency-sustainability link. When banks earn stable margins, operational gains are more likely to be reinvested in sustainable initiatives such as digital inclusion and green lending. This finding aligns with *Stakeholder Theory* (Freeman, 1984), suggesting that financial stability facilitates responsiveness to stakeholder expectations.

Finally, **Financial Slack (FS)** exhibits a curvilinear moderating pattern with LDR ($\beta_3 = 0.062, p < 0.10$), implying that moderate slack strengthens the LDR–CSP relationship, but excessive slack may reduce efficiency. This supports the *Behavioral Theory of the Firm* (Cyert & March, 1963), which posits that slack enables flexibility and innovation but may lead to inefficiency if not managed properly. Collectively, these results confirm that strategic financial elements enhance the translation of risk management practices into sustainable outcomes. Banks with higher capitalization, profitability, and flexible resource structures are better positioned to balance risk control with long-term social and environmental commitments.

Discussion

The empirical findings substantiate the argument that **effective risk management is a critical enabler of sustainability performance** in the banking sector. Consistent with *Risk Management Theory*, minimizing credit, liquidity, and operational risks safeguards the financial base required to support sustainability-oriented projects (Mikes & Kaplan, 2015). The significant moderating effects of **CAR, NIM, and FS** further highlight the importance of strategic alignment between financial resilience and sustainability goals. High capitalization not only mitigates shocks but also increases stakeholder confidence, allowing banks to undertake long-term ESG investments. Similarly, profitability through stable NIM expands the resource base for sustainability disclosure and green financing. Meanwhile, financial slack—when optimally managed—provides flexibility for innovation and non-financial performance enhancement.

These results align with the **Resource-Based View (RBV)**, which posits that unique internal capabilities drive sustainable advantage (Barney, 1991), and with **Contingency Theory**, which emphasizes that strategic fit determines effectiveness (Donaldson, 2001). The findings also reinforce *Stakeholder Theory* by demonstrating that prudent financial and risk management practices align with stakeholder interests, thereby ensuring both legitimacy and long-term value creation (Freeman, 1984).

From a policy standpoint, the study underscores the need for **integrating sustainability objectives into banks' risk governance frameworks**. Regulators such as OJK should continue promoting risk-based sustainability metrics in supervisory assessments. Banks, in turn, should focus on strengthening capitalization and intermediation profitability to enhance their capacity for sustainable transformation.

Table 4. Summary of Hypothesis Testing

Hypothesis	Statement	Result
H1	NPL negatively affects CSP	Supported
H2	LDR significantly affects CSP	Supported
H3	BOPO positively affects CSP	Supported
H4	CAR positively moderates the relationship between NPL and CSP	Supported
H5	NIM positively moderates the relationship between BOPO and CSP	Supported
H6	FS moderates the relationship between LDR and CSP	Partially supported

H1: *The Effect of Non-Performing Loans (NPL) on Corporate Sustainability Performance (CSP)*

The results on table 4 confirm that **Non-Performing Loans (NPL)** have a **negative and significant** impact on **Corporate Sustainability Performance (CSP)**, indicating that higher credit risk erodes banks' capacity to engage in sustainability activities. This finding aligns strongly with *Risk Management Theory* (Mikes & Kaplan, 2015), which posits that increased exposure to financial risk limits an institution's ability to maintain stability and allocate funds for non-financial objectives. From a *Stakeholder Theory* perspective (Freeman, 1984), deteriorating loan quality undermines stakeholder confidence—particularly that of depositors, investors, and regulators—reducing the

bank's legitimacy and willingness to invest in socially responsible activities. Similarly, under the *Resource-Based View (RBV)* (Barney, 1991), higher NPLs reflect inefficient utilization of core financial resources, depleting the capital base that serves as a prerequisite for sustainability investment.

Empirical evidence supports these findings. Studies by Phung et al. (2022) and Boussaada et al. (2023) observed similar relationships in ASEAN and MENA regions, where poor asset quality constrained banks' ESG disclosures and social investments. Within the Indonesian context, the impact is even more pronounced given the sector's relatively higher dependency on credit income. Hence, effective credit risk control—through robust provisioning and underwriting standards—becomes a critical enabler of long-term sustainability.

H2: The Effect of Loan-to-Deposit Ratio (LDR) on CSP

The **Loan-to-Deposit Ratio (LDR)** shows a **positive and significant** influence on CSP, suggesting that efficient liquidity management contributes to sustainable performance. This result is consistent with *Financial Intermediation Theory* (Diamond, 1984), which views optimal lending as central to economic and social value creation. Banks that effectively transform deposits into productive credit contribute not only to profitability but also to financial inclusion and sustainable economic growth. From the *Stakeholder Theory* lens, maintaining a balanced LDR aligns with depositors' and regulators' expectations for stability while simultaneously supporting broader developmental objectives. When managed prudently, higher LDR values reflect the bank's commitment to channeling resources toward productive sectors, including sustainable and inclusive financing.

Empirically, Nuryanto et al. (2020) found that efficient liquidity use enhances financial and sustainability outcomes among ASEAN banks. However, this positive effect remains conditional: excessive LDR may increase liquidity risk, thereby constraining long-term CSP. Thus, the result affirms *Contingency Theory* (Donaldson, 2001)—that liquidity management must fit with contextual factors such as market conditions and capital adequacy. In Indonesia, where credit intermediation remains the primary profit source, a balanced LDR becomes vital not only for profitability but also for achieving the social dimensions of sustainability mandated by the OJK's *Sustainable Finance Roadmap (2021–2025)*.

H3: The Effect of Operational Efficiency (BOPO) on CSP

The study finds that **Operational Efficiency (BOPO)** has a **positive and significant** effect on CSP, demonstrating that managerial discipline and cost efficiency enhance banks' capacity for sustainable performance. According to the *Resource-Based View (RBV)*, operational efficiency represents an internal capability that allows firms to reallocate savings from reduced costs into sustainability-related initiatives such as green banking and digital transformation (Hart & Dowell, 2011).

This result also resonates with *Agency Theory* (Jensen & Meckling, 1976), suggesting that efficient resource utilization reduces agency costs, enabling management to pursue both financial and non-financial goals. Operational efficiency thus becomes a tangible manifestation of a bank's strategic competency that enhances stakeholder value. Empirical evidence corroborates this. Febrianti & Ladinus (2022) found that cost-efficient Indonesian banks demonstrated higher profitability and social engagement. Similarly, Siregar & Haryono (2023) highlighted operational discipline as a key determinant of successful green banking practices. This consistency reinforces the idea that operational efficiency not only improves financial results but also supports the broader *Triple Bottom Line*—economic, social, and environmental dimensions (Elkington, 1998).

H4: The Moderating Role of Capital Adequacy Ratio (CAR)

The findings reveal that **Capital Adequacy Ratio (CAR)** positively moderates the relationship between NPL and CSP. This means that banks with stronger capital buffers can mitigate the adverse effects of credit risk on sustainability. The result validates *Contingency Theory* (Donaldson, 2001), emphasizing that the effectiveness of risk management depends on the organization's contextual financial strength. From the *Resource-Based View* perspective, capital serves as a critical strategic asset that enables firms to absorb shocks and continue investing in innovation and sustainability (Berger & Bouwman, 2013). In contrast, banks with weak capitalization are more vulnerable to financial distress, often prioritizing short-term solvency over long-term ESG commitments.

This moderating pattern is consistent with Kim & Shin (2019), who demonstrated that capital strength enhances sustainability engagement among Korean financial institutions. In Indonesia, where regulatory capital requirements ($CAR \geq 8\%$) are already exceeded by most listed banks, higher CAR values provide flexibility to maintain CSR expenditures even during volatile periods. Hence, CAR strengthens the link between prudent risk management and sustainability by acting as a financial safeguard that preserves stakeholder confidence and ensures operational continuity.

H5: The Moderating Role of Net Interest Margin (NIM)

The analysis indicates that **Net Interest Margin (NIM)** significantly strengthens the relationship between operational efficiency (BOPO) and CSP. This implies that profitability from intermediation activities amplifies the positive effects of operational efficiency on sustainability performance. The finding aligns with *Stakeholder Theory* (Freeman, 1984), which posits that financial strength allows firms to address a broader range of stakeholder interests. Profitable banks, reflected in stable NIM, can afford to invest in environmental and social programs

without compromising shareholder returns. Moreover, under the *Resource-Based View*, NIM represents a dynamic capability—an internal resource that generates the financial surplus necessary for long-term sustainability investments (Anindiandyah et al., 2021).

Empirically, Liu et al. (2024) found that profitability from core banking activities enables the integration of ESG practices into lending policies. The Indonesian context mirrors this relationship: banks with healthy NIMs are better positioned to support green lending, financial literacy initiatives, and digital inclusion. Thus, profitability—when aligned with efficiency—serves as a catalyst that transforms operational success into sustainability outcomes, bridging financial and non-financial objectives in line with *Triple Bottom Line* principles.

H6: The Moderating Role of Financial Slack (FS)

The study finds a **partial moderating effect of Financial Slack (FS)** on the relationship between LDR and CSP, confirming a *non-linear* dynamic. Moderate levels of slack enhance the LDR–CSP relationship by providing flexibility and liquidity to pursue sustainable investments, whereas excessive slack can diminish efficiency and discipline. This pattern is consistent with the *Behavioral Theory of the Firm* (Cyert & March, 1963), which argues that slack enables innovation and adaptability but may also induce complacency. From a *Contingency Theory* standpoint, the effectiveness of slack depends on managerial discipline and strategic alignment with long-term objectives.

Empirical studies such as Lin et al. (2020) emphasize that financial slack positively influences sustainability when effectively governed. Similarly, George (2005) found that discretionary resources enhance firm performance only when managers deploy them strategically. In Indonesia, this result implies that maintaining optimal liquidity buffers—not excessive reserves—is crucial for balancing financial prudence and sustainability investment. Well-managed slack serves as a strategic cushion that allows banks to maintain green financing and CSR commitments amid financial uncertainty.

CONCLUSION AND POLICY RECOMMENDATIONS

Summary of Findings

This study empirically examined the relationship between **risk management strategies** and **Corporate Sustainability Performance (CSP)** among publicly listed banks in Indonesia, focusing on the moderating roles of **Capital Adequacy Ratio (CAR)**, **Net Interest Margin (NIM)**, and **Financial Slack (FS)**. Drawing upon *Stakeholder Theory*, *Resource-Based View (RBV)*, *Contingency Theory*, and *Risk Management Theory*, the analysis revealed that financial prudence, when supported by strategic internal resources, significantly enhances sustainability outcomes. The results demonstrate that **Non-Performing Loans (NPL)** negatively affect CSP, confirming that credit risk deteriorates financial and non-financial performance. In contrast, both **Loan-to-Deposit Ratio (LDR)** and **Operational Efficiency (BOPO)** exert positive influences, indicating that prudent liquidity management and efficient operations contribute to improved sustainability performance.

Regarding the moderating variables, **CAR** and **NIM** significantly strengthen the relationship between risk management and CSP, whereas **FS** exhibits a partial and curvilinear moderation, enhancing sustainability only when maintained at optimal levels. These findings underscore that sustainability in banking is contingent upon the institution's **financial resilience, profitability, and resource flexibility**. Taken together, the results affirm that **effective risk management, when aligned with internal financial strength, forms the foundation of sustainable banking**. This alignment allows institutions to balance profitability with broader social and environmental objectives—an increasingly vital capability in emerging economies such as Indonesia.

Theoretical Contributions

This research extends existing knowledge in three major ways. **First**, it integrates **Risk Management Theory** and **Corporate Sustainability frameworks** by empirically demonstrating that risk mitigation is not only a defensive mechanism but also a strategic driver of sustainable performance. **Second**, it advances the **Resource-Based View (RBV)** by identifying **CAR, NIM, and FS** as strategic internal resources that enable banks to convert financial stability into sustainability outcomes. The findings reveal that these financial capacities act as *moderating mechanisms* that either amplify or dampen the effectiveness of risk management on CSP—supporting the RBV's assertion that firm-specific resources underpin competitive and sustainable advantages (Barney, 1991; Hart & Dowell, 2011). **Third**, the study reinforces **Contingency Theory**, confirming that the impact of risk management on sustainability is context-dependent. Banks with stronger capital buffers, higher profitability, and optimal financial flexibility demonstrate greater capacity to sustain ESG-oriented investments, validating the idea that organizational effectiveness depends on contextual fit (Donaldson, 2001). Collectively, these theoretical integrations provide a comprehensive understanding of sustainable banking—one that views **financial discipline and sustainability not as trade-offs, but as mutually reinforcing constructs**.

Managerial Implications

For banking practitioners, the findings provide several actionable insights. **(1)** Banks must prioritize the **integration of sustainability goals into risk governance frameworks**. Managing credit, liquidity, and operational risks effectively ensures that financial stability can support—not hinder—sustainability initiatives. **(2)** Strengthening **Capital Adequacy Ratio (CAR)** is crucial. Higher capitalization not only protects against volatility but also enhances confidence among stakeholders and regulators, enabling banks to sustain long-term sustainability commitments even during economic downturns. **(3)** Enhancing **profitability through Net Interest Margin (NIM)** offers flexibility to fund sustainability-oriented programs such as green lending, community engagement, and financial inclusion. Profitability and sustainability should therefore be pursued in parallel rather than sequentially. **(4)** Managing **Financial Slack (FS)** optimally is essential. While sufficient liquidity facilitates CSR and innovation, excessive slack may signal inefficiency. Banks should adopt dynamic liquidity policies that maintain flexibility without compromising discipline. **(5)** The findings further encourage Indonesian banks to **institutionalize sustainability reporting and ESG integration** in line with OJK's *Sustainable Finance Roadmap (2021–2025)*. Embedding CSP indicators within risk and performance dashboards will help align internal performance systems with global standards such as GRI, SASB, and UNEP FI.

Policy Recommendations

From a regulatory perspective, this study offers several policy insights:

1. **Strengthen supervisory frameworks** to ensure that sustainability metrics (CSP, ESG) are integrated into the *Risk-Based Bank Rating (RBBR)* system. Regulators such as **OJK** and **Bank Indonesia** should align sustainability assessment criteria with credit risk and capital adequacy supervision.
2. **Introduce incentives**—such as lower reserve requirements or tax relief—for banks that demonstrate consistent sustainability performance or ESG-aligned lending portfolios. These mechanisms would motivate banks to embed sustainability within their core strategies.
3. Mandate enhanced **transparency in sustainability reporting**, especially for risk-related disclosures. Linking CSP to capital requirements could encourage better governance and stakeholder trust.
4. **Encourage collaboration between regulators, financial institutions, and academia** to develop standardized sustainability metrics that are both globally benchmarked and locally relevant, ensuring that Indonesia's financial system contributes meaningfully to SDG targets.

Limitations and Future Research Directions

Despite its contributions, this study has several limitations that provide avenues for future research. First, the analysis focuses solely on publicly listed banks in Indonesia, which may limit generalizability to rural or Islamic banking institutions. Future studies should expand the sample to capture heterogeneity across financial systems. Second, CSP was measured primarily using disclosure-based indicators; incorporating **qualitative ESG performance data** or **stakeholder perception indices** may yield deeper insights into sustainability outcomes. Third, future research could employ **dynamic panel models (GMM)** or **structural equation modeling (SEM)** to explore causality and mediating mechanisms more robustly. Finally, comparative cross-country studies across ASEAN economies could identify regional patterns and policy harmonization needs for sustainable finance.

Overall, this study concludes that **sound risk management, supported by adequate capital, profitability, and financial flexibility, forms the strategic foundation of sustainable banking**. By aligning risk governance with sustainability imperatives, Indonesian banks can achieve financial resilience, stakeholder trust, and social legitimacy simultaneously. As sustainability transitions from a regulatory compliance issue to a core strategic priority, this research underscores that **the pathway to sustainable finance lies not in reducing risk appetite, but in managing it intelligently—anchored in strategic capability and long-term vision**.

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