

“Does sustainable finance strengthen corporate governance? Evidence from ASEAN banks”

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DOES SUSTAINABLE FINANCE STRENGTHEN CORPORATE GOVERNANCE? EVIDENCE FROM ASEAN BANKS

Abstract

The growing global demand for the integration of strong corporate governance in the banking industry is essential for enhancing financial performance. However, the interactive role of sustainable finance in strengthening governance mechanisms remains relatively underexplored. This study aims to examine whether adopting sustainable finance practices strengthens corporate governance mechanisms in the banking sector in ASEAN countries during the period from 2018 to 2022. Utilizing the Fixed Effects Model, this study presents a notable finding. The results indicate that the interaction between management scores and green bonds has a positive and significant effect on Return on Assets, whereby a 5% increase in green bonds exposure raises ROA by 0.248, but exerts a negative effect on Return on Equity, with a decrease of 0.340 for every 1% increase. In contrast, the interaction between shareholder scores and green bonds has a negative and significant impact on ROA, with a decline of 0.223 for each 5% increase, while positively influencing ROE by 0.222 for every 1% increase. This study confirms that green bonds asymmetrically moderate the relationship between corporate governance and banking performance, in which management-oriented governance enhances asset efficiency but suppresses ROE, whereas shareholder-oriented governance reduces ROA while improving ROE. Conceptually, green bonds function as a balancing mechanism between corporate governance and banking performance, whereby managerial governance improves asset efficiency at the expense of equity returns, while shareholder-based governance enhances ROE with the trade-off of lower ROA.

Keywords

corporate governance, sustainable finance, banking
performance, ASEAN, green bonds, social bonds

JEL Classification

G21, C20, G32, Q56

INTRODUCTION

ASEAN economic integration is driving the transformation of the banking sector to implement good corporate governance (GCG) that is more transparent, accountable, and adaptive to regional risk dynamics (Karim et al., 2024; Lee, 2022). Amidst increasing competition and market demands, the implementation of strong governance has proven to be a crucial foundation for bank operational stability, preventing opportunistic practices, and maintaining investor confidence (Fauzie et al., 2025; Wolff, 2022). However, in an increasingly sustainability-oriented financial ecosystem, governance alone is insufficient without the support of a sustainable financing paradigm.

This study focuses on seven ASEAN countries (Indonesia, Malaysia, the Philippines, Singapore, Thailand, Vietnam, and Myanmar) based on considerations of data availability, the level of financial market development, and the comparability of corporate governance practices and sustainability disclosures (Chairina & Tjahjadi, 2023; Salem et al., 2025). In the ASEAN region, the situation regarding sustainability reporting and ESG disclosure remains uneven; as such, reporting is still

largely voluntary in many countries, which limits the availability of consistent data for empirical analysis (Abu Afifa et al., 2025). Therefore, focusing on these seven countries allows this study to produce more reliable and comparable analyzes in examining the relationship between sustainable finance and corporate governance in the ASEAN banking sector.

The development of sustainable finance in ASEAN presents new tools for banks to incorporate environmental, social, and governance (ESG) perspectives into their business strategies (Shahimi et al., 2024). The implementation of sustainable finance, sustainability-based risk management, and ESG integration in lending strengthen existing governance structures (Kaakandikar & Bhalerao, 2025; Mariappan et al., 2025). Sustainable finance also creates new transparency standards through sustainability disclosures, enabling banks to pursue not only profitability but also long-term value for stakeholders (Distefano et al., 2025; Hummel & Jobst, 2024). This improves governance quality and creates synergies in risk management.

Ultimately, the synergy between good governance and sustainable finance can strengthen banking performance in ASEAN through increased efficiency, long-term stability, and broader access to global funding (Nathanian & Ekawati, 2024; Van & Abu Afifa, 2024). Banks with strong governance and consistent implementation of sustainable finance principles tend to gain greater market trust, attract quality investors, and achieve more stable profitability (Palmieri et al., 2025; Porzio & Battaglia, 2024). Thus, sustainable finance is not merely a supporting instrument but a catalyst that strengthens the influence of governance on banking performance in ASEAN.

1. LITERATURE REVIEW

Corporate governance and sustainable finance have become central issues in the global banking industry, particularly in emerging economies where financial stability and sustainable development are closely interconnected (Ahmed et al., 2025; Liu et al., 2024; Shahimi & Zahari, 2025). Effective corporate governance mechanisms are essential for ensuring transparency, accountability, and responsible decision-making within financial institutions (Boulaksili et al., 2023; X. Y. Chen, 2024; Dongol & Kumar Shrestha, 2026; Kulmie & Ibrahim, 2024). At the same time, the growing emphasis on sustainable finance reflects increasing awareness of the need to integrate environmental, social, and governance (ESG) considerations into financial activities (Baldissarro et al., 2026; Joubrel & Maksimovich, 2023; Kaluvilla, 2025; Mariappan et al., 2025; Stoicescu & Sima, 2025). These developments highlight the importance of understanding how governance structures and sustainable finance practices interact to influence banking performance.

Building on this perspective, recent studies have increasingly emphasized the importance of integrating corporate governance and sustainable

finance practices in the banking sector. Strong governance mechanisms help ensure transparency, accountability, and effective risk management within financial institutions (Jallali & Zoghلامي, 2022; Nafti & Kateb, 2025; Tanbour et al., 2025a). In banking organizations, governance structures such as board independence, ownership structure, and regulatory oversight play a crucial role in reducing agency conflicts and improving institutional performance (Alnor et al., 2024; Ebbini et al., 2024; Palmieri et al., 2026; Singh, 2025; Vetrivel et al., 2024). Empirical evidence suggests that banks with stronger governance frameworks tend to demonstrate better financial performance, greater resilience to financial shocks, and higher investor confidence (Gavious et al., 2026; Gulati, 2022; Rabby et al., 2026; Zhang et al., 2022).

From a theoretical perspective, agency theory provides an important foundation for understanding the role of corporate governance in financial institutions. According to agency theory, conflicts of interest between shareholders (principals) and managers (agents) may lead to inefficient managerial behavior if adequate monitoring mechanisms are not in place (Cherkaoui & Oudrhough, 2024; Kasbar et al., 2023; Shiyyab et al., 2024). Corporate governance mechanisms such as board oversight,

transparency requirements, and shareholder protection are designed to mitigate these agency conflicts (Ammer & Sattarov, 2025; Cherkaoui & Oudrhough, 2024; Ebbini et al., 2024; Hassanein & Kokel, 2022; Kasbar et al., 2023; Palmieri et al., 2026; Shiyyab et al., 2024; Vetrivel et al., 2024; Vickneswaran, 2024). Empirical studies have consistently demonstrated that stronger governance structures are associated with improved financial performance, reduced risk exposure, and increased investor confidence in banking institutions (Adnan et al., 2023; Kacem & Harbi, 2022; C. Lee et al., 2023; Tanbour et al., 2025b; Wu & Chen, 2024).

In parallel with governance developments, sustainable finance has gained significant attention as a strategic approach to promoting responsible investment and long-term financial stability. Sustainable finance refers to financial activities that integrate environmental, social, and governance (ESG) considerations into investment and lending decisions (Behera & Nanda, 2025; Dimmelmeier, 2024; Dwivedi et al., 2025; Edmans & Kacperczyk, 2022; Hilal & Imad, 2025; Kanungo et al., 2025; Koundal et al., 2025; Macpherson & Rimmel, 2025). Financial institutions increasingly adopt sustainable finance instruments such as green bonds, social bonds, and sustainability bonds, and ESG-based investment strategies to address climate risks, social challenges, and regulatory expectations (Aracil & Sancak, 2023; Hanna et al., 2026; Hridhya et al., 2025; Meo & Staniewski, 2024; Özdemir & Taşpunar Altuntaş, 2024). These instruments not only contribute to sustainable economic development but also enhance the credibility and transparency of financial institutions (Dahbi et al., 2025; Gupta, 2026; Jacob et al., 2025; Jamali & Voghouei, 2025; Keitel & Öner, 2024; Macit & Göçer, 2025; Randa, 2026).

Importantly, sustainable finance does not operate independently from governance structures. Several empirical studies indicate that the adoption of sustainable finance practices can strengthen governance mechanisms within organizations (Irfan et al., 2025; Pellegrino et al., 2025; Raheer et al., 2025). ESG oriented financial policies encourage greater transparency, improved disclosure practices, and stronger accountability mechanisms (Biswas & Dygas, 2025b; Cam & Klovienne,

2025; Ferdous et al., 2025; Yuan et al., 2022). As a result, financial institutions that actively implement sustainable finance initiatives tend to demonstrate higher governance quality and stronger stakeholder trust (Adu, 2022; Elarabi & Khalifa, 2025; Hussain, 2025; Kant et al., 2025; Nanduri et al., 2025; Susan & Pan, 2024). In addition, sustainable finance initiatives often require financial institutions to comply with international reporting standards and sustainability disclosure frameworks, which further improve governance transparency (Emer et al., 2026; Oliveira & Leal, 2024).

This interaction becomes even more relevant in emerging economies where financial systems are undergoing rapid transformation. In such contexts, governance reforms and sustainable finance initiatives are often implemented simultaneously as part of broader financial sector modernization efforts (Adow, 2025; Gaviyau & Sibindi, 2025; Wang & Shao, 2024). Previous research has shown that emerging markets that adopt sustainable finance policies tend to experience improvements in governance quality, institutional credibility, and financial stability (Mirza et al., 2025; Rajput & Jindal, 2025; Zhang, 2023).

The relationship between governance and sustainable finance is particularly important in the ASEAN region. Over the past decade, ASEAN countries have increasingly promoted sustainable financial systems through various regional initiatives, including the development of green bond markets and sustainable banking frameworks (Dung & Hanh, 2025; Khoi & Dinh, 2026; Mo et al., 2025; Quang & Thao, 2022; Setyawati & Pranindita, 2025). Regulatory authorities and financial institutions in several ASEAN countries have also introduced sustainability disclosure requirements and ESG reporting standards (Biswas & Dygas, 2025a; Pratama et al., 2022; Salgueiro et al., 2025). These developments highlight the growing role of sustainable finance in shaping governance practices within the regional banking sector.

Despite the growing attention to sustainable finance in ASEAN, empirical research examining its role in strengthening corporate governance remains limited. Most existing studies focus primarily on the relationship between governance mechanisms and financial performance (Adegbayibi &

Adelowotan, 2024; Malik et al., 2026; Singh et al., 2022), while relatively few studies investigate how sustainable finance initiatives may enhance governance effectiveness (Kunjumammed, 2025; Liu et al., 2026). Moreover, cross-country analyses of ASEAN banking systems remain scarce, even though the region provides an important context for examining the interaction between governance reforms and sustainable finance policies (Badriah et al., 2024; Nguyen, 2022; Quoc et al., 2025; Shahimi et al., 2024).

Overall, previous studies emphasize the importance of corporate governance in improving banking performance and highlight the growing relevance of sustainable finance in shaping responsible financial systems (Jallali & Zoghalmi, 2022; Pellegrino et al., 2025; Pyka et al., 2025). However, empirical research examining whether sustainable finance strengthens governance mechanisms in ASEAN banks remains limited. Therefore, this study has two objectives: (1) to examine the effect of corporate governance on banking performance in ASEAN countries, and (2) to investigate whether sustainable finance strengthens the relationship between corporate governance and banking performance.

2. RESEARCH METHODOLOGY

2.1. Data

The research scope focuses on banking performance and the moderating role of sustainable finance. The banking industry has a central impact on the environment due to its primary role as a source of funding for various industrial sectors (Mirza et al., 2023). Evaluating banking performance is also crucial for regulators and financial authorities to ensure the stability of the overall financial system (Spaseska et al., 2025). Monitoring banking performance is also necessary to prevent financial crises and protect the interests of shareholders and the economy as a whole (Rathnayake et al., 2022). ASEAN is one of the fastest-growing economies in the world and one of the most vulnerable regions in the world to the economic and humanitarian impacts of climate change over the past two decades (Overland et al., 2021).

This study employs a panel data approach that combines cross-country and time-series observations to examine the relationship between sustainable finance and corporate governance in ASEAN banks. The purpose of using panel data is to capture general patterns across the region rather than to estimate separate models for each country (H. Sun et al., 2019). ASEAN countries differ considerably in terms of economic conditions, social environments, regulatory systems, and institutional structures (Karabiyik et al., 2019). Such heterogeneity makes direct comparison at the individual country level less reliable within a unified empirical framework. Panel data analysis allows the model to control for unobserved heterogeneity across countries while improving estimation efficiency by increasing the number of observations and degrees of freedom. Therefore, the analysis focuses on the aggregated panel results rather than presenting separate estimates for each country, enabling the study to identify broader regional relationships between sustainable finance and corporate governance in the ASEAN banking sector.

This research data covers seven countries in the ASEAN region, namely Indonesia, Malaysia, the Philippines, Singapore, Thailand, Vietnam, and Myanmar, with a time span of 2018 to 2022. The diversity of economic development levels in ASEAN creates challenges for the integration of ESG principles in banking practices, as each country has different regulatory readiness and institutional capacity (Shahimi et al., 2024). This challenge is increasingly apparent when ASEAN countries face environmental issues such as climate change and deforestation, thus driving the need for green banking to shift financing towards more sustainable activities (Hermawan & Khoirunisa, 2024). The dependent variable used is banking performance as measured by ROA (Return on Assets), while the independent variable is corporate governance proxied by the governance score, consisting of the management score and shareholder score. The moderating variable is measured using sustainable finance indicators, namely green bonds, social bonds, and sustainability bonds that reflect commitments to sustainable financing. All data were collected from secondary sources such as annual reports, sustainability reports, official websites of state financial regulators, as well as supporting literature in the form of journals, books, and scientific publications. The analy-

Table 1. Operational definition of variables

Variable	Definitions	Proxy	Measurement
Bank Performance	Bank performance reflects the ability of a bank to efficiently generate profits from its assets and equity while maintaining financial stability and regulatory compliance	LNROA	Natural Logarithm of Return on Assets
		LNROE	Natural Logarithm of Return on Equity
Corporate Governance	Corporate governance represents the system of managerial control and shareholder oversight mechanisms that regulate decision-making, accountability, and risk management within banks	LNMC	Natural Logarithm of Management Score
		LNCS	Natural Logarithm of Shareholder Score
Sustainable Finance	Sustainable finance refers to banking activities that integrate environmental and social considerations into financing decisions to support long-term sustainability objectives	LNGB	Natural Logarithm of Green Bonds
		LNCSB	Natural Logarithm of Social Bonds
Risk Capital Adequacy	Capital adequacy risk reflects a bank's capacity to absorb potential losses while maintaining regulatory capital requirements	LNCR	Natural Logarithm of Capital Adequacy Ratio
Credit Risk	Credit risk represents the potential loss arising from borrowers' failure to meet their contractual obligations	LNPL	Natural Logarithm of Non-Performing Loan
Liquidity Risk	Liquidity risk reflects a bank's ability to meet short-term financial obligations without incurring excessive costs.	LNDR	Natural Logarithm of Loan to Deposit Ratio

sis was conducted using a static panel data model with Ordinary Least Squares (OLS) to address potential endogeneity, ensure estimation consistency, and provide more valid results in describing the influence of governance and sustainable finance on banking performance in the ASEAN region.

2.2. Model specification

This study employs a static panel data approach to examine the effect of corporate governance on bank performance, while assessing the moderating role of sustainable finance. Bank performance is proxied by Return on Assets (ROA) and Return on Equity (ROE). Corporate governance is measured using management score and shareholder score, whereas sustainable finance is captured through the issuance of green bonds and social bonds. To control bank-specific risk factors, the model includes Capital Adequacy Ratio (CAR) as a proxy for capital risk, Non-Performing Loans (NPL) for credit risk, and Loan to Deposit Ratio (LDR) for liquidity risk. The empirical specification incorporates an interaction term between corporate governance and sustainable finance to capture the moderating effect on bank performance. Here is an illustration of the static panel data model in this study:

$$\begin{aligned} \text{BankPerf}_{i,t} = & \alpha_0 + \beta_1 CG_{i,t} \\ & + \beta_2 (CG_{i,t} \cdot SF_{i,t}) + \beta_3 CAR_{i,t} + \beta_4 NPL_{i,t} \\ & + \beta_5 LDR_{i,t} + \varepsilon. \end{aligned} \quad (1)$$

Specific models in this study are:

Model 1

$$\begin{aligned} ROA_{i,t} = & \alpha_0 + \beta_1 CG_{i,t} + \beta_2 (CG_{i,t} \cdot SF_{i,t}) \\ & + \beta_3 CAR_{i,t} + \beta_4 NPL_{i,t} + \beta_5 LDR_{i,t} + \varepsilon. \end{aligned} \quad (2)$$

Model 2

$$\begin{aligned} ROE_{i,t} = & \alpha_0 + \beta_1 CG_{i,t} + \beta_2 (CG_{i,t} \cdot SF_{i,t}) \\ & + \beta_3 CAR_{i,t} + \beta_4 NPL_{i,t} + \beta_5 LDR_{i,t} + \varepsilon. \end{aligned} \quad (3)$$

The model is estimated using Ordinary Least Squares (OLS) on panel data, given the static nature of the specification and the absence of a lagged dependent variable. OLS is considered appropriate as the analysis focuses on contemporaneous relationships and assumes that unobserved bank-specific characteristics are either time-invariant or adequately captured through the included explanatory variables. The error term is assumed to follow a one-way error component structure, consisting of an unobserved individual-specific effect and an idiosyncratic disturbance term. This specification allows for consistent estimation of parameters while maintaining model parsimony. Moreover, OLS estimation facilitates straightforward interpretation of interaction effects, which is particularly relevant for evaluating the moderating role of sustainable finance. Overall, this methodological approach provides a robust and transparent framework for assessing governance-performance linkages in the banking sector.

2.3. Estimation procedure

The analysis follows these steps:

- 1) descriptive statistics;
- 2) correlation and multicollinearity diagnostics;
- 3) chow test to compare pooled OLS and fixed effects;
- 4) Hausman test to compare fixed and random effects;
- 5) final estimation using fixed-effects models with heteroskedasticity-robust standard errors.

3. RESULTS

3.1. Descriptive statistics

Table 2 presents descriptive statistics for the observed variables in seven ASEAN countries: Indonesia, Malaysia, the Philippines, Singapore, Thailand, Vietnam, and Myanmar. The described values are all within a reasonable range and demonstrate a high degree of consistency with those generally documented in previous studies. Based on the descriptive analysis, the banking performance variables measured by LNROA and LNROE show average values of 0.625 and 0.837, respectively, with relatively stable data variation reflected by standard deviations of 0.082 and 0.102, and a minimum-to-maximum range reflecting differences in profitability levels between banks. The governance variables represented by LNMCG and LNSCG also show relatively high average values of 1.611 and 1.555, respectively, indicating consistency

between management and shareholder scores. Furthermore, sustainable finance instruments through LNGB and LNSCB reflect varied development, where green bonds have an average of 1.019 with a low valley, while social bonds have an average of 0.369 with the highest variability (std. dev. 0.258), illustrating differences in implementation between institutions. Risk variables measured through LNCAR, LNNPL, and LNLDR show relatively controlled conditions, with LNCAR of 1.046, a fairly low NPL (0.265), and LDR approaching a full unit (0.999), so the overall data indicate stable performance and risk management across 355 observations.

In this study, the Ordinary Least Squares (OLS) panel estimator formulated in the study is used to estimate the statistical panel model (Nolan, 2020; Víšek, 2015). This approach is applied to a statistical panel dataset with White cross-section robust standard errors to minimize potential bias arising from endogeneity originating from unobserved heterogeneity, heteroscedasticity, and autocorrelation in the model (Cribari-Neto & Lima, 2010; Lee & Pustejovsky, 2024). The dependent variables used are Return on Assets (ROA) and Return on Equity (ROE) as proxies for banking performance, while management corporate governance (MCG) and shareholder corporate governance (SCG) are included as the main independent variables. To control for specific banking risks, this model also includes the Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), and Non-Performing Loans (NPL) as control variables, as well as green bonds (GB) and social bonds (SCB) as moderating variables representing sustainable finance. The main focus of this study is to examine the role of sustainable finance in moderating the influence of corporate governance on banking performance.

Table 2. Descriptive statistics

Variable	Definitions of variable	Mean	Std. dev	Minimum	Maximum	Observation
LNROA	Natural Logarithm of Return on Assets	0.625	0.082	0.427	0.907	355
LNROE	Natural Logarithm of Return on Equity	0.837	0.102	0.513	1.157	355
LNMCG	Natural Logarithm of Management Score	1.611	0.128	0.741	1.723	355
LNSCG	Natural Logarithm of Shareholder Score	1.555	0.212	0.526	1.716	355
LNGB	Natural Logarithm of Green Bonds	1.019	0.115	0.350	1.270	355
LNSCB	Natural Logarithm of Social Bonds	0.369	0.258	0.012	0.693	355
LNCAR	Natural Logarithm of Capital Adequacy Ratio	1.046	0.090	0.796	1.282	355
LNNPL	Natural Logarithm of Non-Performing Loan	0.265	0.157	0.040	0.825	355
LNLDR	Natural Logarithm of Loan-to-Deposit Ratio	0.999	0.027	0.926	1.099	355

Table 3. Empirical model estimation results

Independent variable	Model 1			Model 2		
	Return on Assets			Return on Equity		
	Coefficient		Prob	Coefficient		Prob
MCG	−0.177		0.032**	0.218		0.037**
SCG	0.145		0.016**	−0.143		0.053*
MCG × GB	0.248		0.006**	−0.340		0.000***
MCG × SCB	−0.129		0.124	0.127		0.142
SCG × GB	−0.223		0.016**	0.222		0.000***
SCG × SCB	0.144		0.079*	−0.132		0.122
CAR	−0.051		0.214	−0.048		0.637
NPL	−0.085		0.015**	−0.157		0.000***
LDR	0.912		0.000***	0.041		0.848
Constanta	−0.207		0.363	0.964		0.001**
R-Squared		0.802			0.752	
Adjusted R-squared		0.742			0.677	
Prob (F-Statistic)		0.000***			0.000***	
Durbin-Watson stat		1.645			1.813	
Multicollinearity		< 0.80			< 0.80	
Chow test						
Cross-section F		0.000			0.000	
Hausman test						
Cross-section random		0.041			0.035	
Lagrange multiplier test						
Breusch-Pagan		0.000			0.000	
Model		FEM			FEM	

Note: ***, **, and * indicate statistical significance at the 1%, 5%, and 10% levels, respectively.

First, autocorrelation is examined using the Durbin–Watson statistic. The reported values indicate no severe serial correlation in the residuals, suggesting that the model specification adequately captures the dynamic structure of the data. Third, potential multicollinearity among explanatory variables is assessed through correlation analysis. The results indicate that correlation coefficients remain below critical thresholds, implying that multicollinearity does not materially distort coefficient estimates. Finally, the overall model adequacy is confirmed through F-statistics, which consistently indicate joint significance of the explanatory variables. The relatively high adjusted R-squared values further suggest that the models exhibit strong explanatory power in capturing variations in banking performance. Based on the results of the Chow test which consistently rejects the pooled OLS model and the Hausman test which indicates a correlation between unobserved individual effects and explanatory variables, all model specifications are estimated using the Fixed Effects Model (FEM) to obtain consistent and unbiased parameter estimates (Collischon & Eberl, 2020; Rüttenauer & Ludwig, 2023; Stater & Hoag, 2023; Sun & Wang, 2022).

Based on Table 3, corporate governance proxied through the management score (MCG) shows a negative and significant influence on banking performance as measured by return on assets (ROA), reflected in the coefficient value of −0.177 with a probability of 0.032. This finding indicates that improving the quality of governance in the managerial aspect does not necessarily directly encourage the efficiency of bank asset utilization in generating profits, even tending to reduce ROA (Adam et al., 2025; Yeboah et al., 2026). This condition may reflect an increase in compliance costs, internal bureaucracy, or more cautious managerial policies that limit management flexibility in making operational decisions oriented towards short-term profitability (Do et al., 2024). Conversely, corporate governance proxied through the shareholder score (SCG) is proven to have a positive and significant influence on ROA (Lunawat et al., 2025; Tahtamoni et al., 2025), with a coefficient of 0.145 and a probability value of 0.016. These results indicate that the stronger the protection of shareholder rights and ownership-based oversight mechanisms, the more effective the bank's performance in managing its assets to generate profits. Thus,

these findings confirm that the role of shareholders in the governance structure has a more direct contribution to improving banking performance than governance aspects focused on internal management.

Furthermore, the results of the study indicate that the role of sustainable finance as a moderating variable in the relationship between corporate governance and return on assets (ROA)-based banking performance is heterogeneous and highly dependent on the type of instrument and the governance dimensions involved. In the managerial governance aspect, green bonds (GB) are proven to be able to strengthen the influence of management score (MCG) on ROA positively and significantly, with a coefficient of 0.248 and a probability of 0.006, indicating that the integration of environmentally based financing is aligned with management policies in improving asset management efficiency. However, when sustainable finance is proxied through social bonds (SCB), the moderating effect on the relationship between MCG and ROA is actually negative and insignificant, reflected in a coefficient of -0.129 with a probability of 0.124, thus suggesting a potential trade-off between social objectives and optimizing asset profitability. In contrast to the shareholder-based governance dimension, green bonds moderate the relationship between shareholder score (SCG) and ROA negatively and significantly, with a coefficient of -0.223 and a probability of 0.016, indicating that an orientation toward environmental compliance and long-term investment may limit the achievement of asset profitability in the short term. Conversely, social bonds show a positive moderating direction on the relationship between SCG and ROA, with a coefficient of 0.144 and a probability of 0.079, which, although significant at a looser level, indicates that socially oriented financing is relatively more aligned with shareholder interests by increasing legitimacy and public trust. Thus, this finding confirms that the effectiveness of sustainable finance as a moderating variable is not universal, but rather determined by the fit between the characteristics of sustainable financing instruments and corporate governance mechanisms in influencing banking performance.

The research findings indicate that corporate governance, as measured by the management score (MCG), has a positive and significant effect on

banking performance, as measured by return on equity (ROE), as reflected by a coefficient of 0.218 with a probability value of 0.037. These results indicate that the more effective the role and quality of governance at the managerial level, the greater the bank's ability to optimize shareholder capital to generate profits. Strengthening management functions, as reflected in strategic decision-making, internal control, and operational efficiency, is a key factor driving increased returns on equity. Conversely, corporate governance, as measured by the shareholder score (SCG), shows a negative effect on ROE, with a coefficient of -0.143 and a probability value of 0.053, which is at the borderline of significance. These findings suggest that governance mechanisms focused on shareholder interests have the potential to create excessive supervisory pressure or more conservative policy preferences, thus limiting management flexibility in increasing equity profitability. Thus, these results confirm the differences in roles between governance dimensions, with managerial effectiveness contributing more directly to increased ROE than governance that emphasizes shareholder control.

Overall, the results of this study indicate that the role of sustainable finance as a moderating variable in the relationship between corporate governance and return on equity (ROE)-based banking performance varies depending on the type of instrument and the governance dimensions involved. In terms of managerial governance, green bonds (GB) negatively and significantly moderate the relationship between management score (MCG) and ROE, with a coefficient of -0.340 and a probability of 0.000, indicating that green financing orientation encourages management to focus more on long-term, low-risk environmental investments, potentially suppressing short-term equity returns. Conversely, social bonds (SCB) exhibit a positive moderating effect on the relationship between MCG and ROE with a coefficient of 0.127, although not statistically significant (probability of 0.142), suggesting that social financing is relatively more aligned with managerial policies, but not yet strong enough to significantly improve equity performance. In contrast to the shareholder-based governance dimension, green bonds are shown to significantly strengthen the relationship between shareholder score (SCG) and ROE,

reflected by a positive coefficient of 0.222 with a probability of 0.000, thus confirming that strong shareholder engagement, when combined with green financing commitments, can encourage the optimization of equity management and increase company value. Conversely, social bonds actually moderate the relationship between SCG and ROE negatively and insignificantly, with a coefficient of -0.132 and a probability of 0.122, indicating a potential trade-off between social objectives and financial profitability. Thus, this finding confirms that the effectiveness of sustainable finance as a moderating variable is largely determined by the suitability of the characteristics of sustainable financing instruments with corporate governance orientation in influencing bank equity returns.

4. DISCUSSION

Banking performance is strongly influenced by the quality of corporate governance and the sustainable financing strategies implemented (Bansal et al., 2025; Temba et al., 2023). In this context, the use of ROA and ROE as performance indicators allows for a more comprehensive analysis of asset efficiency and return on equity, particularly in the heavily regulated banking industry (Alzwi et al., 2025; Gallas et al., 2025). The integration of governance and sustainable finance variables reflects a modern approach that positions banks not only as profit-oriented institutions but also as agents of sustainable development (Koundal et al., 2025). Thus, this research's analytical framework is relevant to explaining the dynamics of contemporary banking performance.

The negative impact of managerial governance on ROA is consistent with the view that strengthening internal controls does not always improve asset efficiency (Gutman et al., 2024). Previous studies have also found that ESG has an inverse effect on bank stability in the short term, suggesting that while ESG integration may pose challenges initially, it can lead to long-term stability and sustainability (Do et al., 2024). In the banking industry, this condition can limit management's ability to respond quickly to market opportunities. Therefore, these findings confirm that overly strict managerial governance has the potential to reduce asset utilization efficiency.

Conversely, shareholder-based governance has been shown to play a significant role in improving banking asset efficiency (Athar et al., 2023). Protection of shareholder rights and external oversight encourage management to allocate assets more productively and with discipline (Duong et al., 2022). Furthermore, market pressure from shareholders contributes to suppressing agency costs, which can harm asset performance (Nanda & Gopalaswamy, 2024). Thus, ownership-based governance is more effective in driving increased ROA than managerial governance.

The differences in the influence of MCG and SCG on ROA reinforce the relevance of agency theory in the banking context (Lunawat et al., 2025). Conflicts of interest between managers and shareholders necessitate targeted governance mechanisms. Excessive focus on internal control can compromise operational efficiency, while shareholder oversight tends to enhance performance orientation (Chen et al., 2021). Therefore, a balance between governance dimensions is key to improving banking asset performance.

The role of green bonds in strengthening the relationship between managerial governance and ROA supports the literature stating that green financing can improve operational efficiency (Sun et al., 2025). Environmentally based investments encourage management to adopt more efficient, transparent, and long-term-oriented projects (Habib & Khan, 2025). In addition, green finance is often associated with improved reputation and stakeholder trust that have a positive impact on performance (Susan & Pan, 2024; Tan et al., 2025). Thus, green bonds are able to correct the weaknesses of managerial governance towards asset efficiency.

Unlike green bonds, social bonds have not yet demonstrated a strong role in supporting banking asset efficiency. Social financing tends to be oriented towards welfare and inclusion impacts, whose financial benefits are more long-term (Leung et al., 2023; Suárez et al., 2020) (Leung et al., 2023; Suárez et al., 2020). This condition can create a trade-off between social goals and optimizing asset performance (Bae & Choi, 2025; Sharam, 2025). Therefore, this finding indicates that social financing has not been fully integrated with managerial strategies to increase ROA.

The negative moderation of green bonds on the relationship between shareholder governance and ROA aligns with findings that green investments can suppress short-term profitability (Farrash & Smolo, 2025). A focus on environmental compliance often shifts shareholder pressure from profit achievement to long-term sustainability (Cavaco et al., 2020; A. K. Gupta & N. Gupta, 2021). While positive for long-term value, this orientation can limit asset efficiency in the initial implementation period. Thus, green bonds are not always aligned with shareholder interests in increasing ROA.

In contrast, social bonds are relatively more aligned with shareholder interests by enhancing social legitimacy and the bank's reputation (Lenzi, 2021; Leung et al., 2023). Increased public trust can boost the stability of third-party funds and gradually improve asset performance (Fisch & Seligman, 2022; Onyshchenko et al., 2022). While the impact is not always strong financially, social financing strengthens banks' relationships with stakeholders. Thus, social bonds have the potential to be a supporting instrument for shareholder-based governance.

In ROE measurements, managerial governance plays a more dominant role in increasing return on equity. Strategic management decisions related to capital structure and cost efficiency directly impact equity profitability (Arhinful et al., 2025). Strengthening managerial functions allows banks to optimize leverage more effectively. Therefore, managerial governance is a key factor in driving banking ROE.

Conversely, shareholder-based governance tends to limit management flexibility in increasing ROE (Ishida & Kochiyama, 2024; Warrad & Khaddam, 2020). Excessive supervisory pressure often encourages conservative policies and risk aversion (Chen et al., 2025). In the banking context, this condition can hinder capital structure optimization. Thus, dominant shareholder control does not always have a positive impact on returns on equity.

The moderating effect of green bonds on the relationship between managerial governance and ROE supports the argument that green investments lower short-term returns. Conversely, the strengthening relationship between shareholder governance and ROE suggests that environmental commitment can be viewed as a signal of long-term value by investors (Mugova et al., 2025; Rohisham et al., 2025). This confirms that investor perceptions play a significant role in equity performance. Therefore, the impact of green bonds on ROE is highly dependent on governance orientation.

Overall, the findings of this study confirm that the effectiveness of sustainable finance as a moderating variable is not universal. The alignment between the type of financing instrument and the dimensions of governance is a determining factor in influencing banking performance. Proper integration of governance with sustainable financing strategies enables banks to achieve a balance between financial performance and sustainability. Therefore, banking policies need to be designed contextually and adaptively to governance and sustainability objectives.

CONCLUSION

This study examines the effect of corporate governance on banking performance and the moderating role of sustainable finance in ASEAN banking. The findings indicate that the effects of corporate governance on banking performance are heterogeneous across governance dimensions and performance measures. Managerial governance tends to weaken asset utilization efficiency, whereas shareholder-based governance contributes positively to banking asset performance. These findings suggest that the effectiveness of corporate governance depends on the specific governance mechanism and the dimension of bank performance being considered.

The findings indicate that managerial governance tends to weaken asset utilization efficiency, while shareholder-based governance contributes positively to banking asset performance. This reflects that strengthening internal control and managerial compliance does not always align with increased operational efficiency, especially when decision-making flexibility is limited. Conversely, external oversight

mechanisms by shareholders encourage disciplined resource allocation and reduced agency costs. Thus, these results strengthen the relevance of agency theory in explaining differences in the effectiveness of governance dimensions on banking performance.

The role of sustainable finance as a moderating variable has been shown to be contextual and dependent on the type of instrument and the governance dimensions involved. Green finance tends to strengthen the effectiveness of managerial governance in improving asset efficiency, but can weaken short-term performance orientation when linked to shareholder interests. Conversely, social finance is relatively more aligned with shareholder-based governance by increasing legitimacy and public trust, although its financial impact is not yet fully optimal. These findings confirm that sustainable finance instruments do not have a homogeneous moderating effect.

In equity-based performance, managerial governance plays a more dominant role than shareholder governance. However, the integration of sustainable finance again produces mixed effects, with green financing suppressing short-term equity returns while enhancing long-term value perceptions for investors. Overall, this study concludes that the effectiveness of sustainable finance is largely determined by the alignment between the characteristics of financing instruments and corporate governance orientation. Therefore, banking policies need to be designed adaptively to balance financial performance and sustainability goals.

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