

SUSTAINABILITY COMMITTEES & ENVIRONMENTAL INITIATIVES: INSIGHTS FROM DUAL BANKING SYSTEMS IN EMERGING MARKETS

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ABSTRACT

Recently, companies have become more concerned with environmental sustainability, and many of them have established sustainability committees (SCs) to entrench sustainability in their strategic planning and corporate culture. Drawing upon insights from stakeholder and legitimacy theories, this study investigates the nexus between SCs and environmental initiatives (EI) in emerging markets having both conventional and Islamic banks. Applying panel regressions, we find evidence indicates that the presence of an SC is positively associated with overall environmental scores, environmental products, environmental innovations, and resource reduction. Subsample analyses reveal that, for IBs, establishing SCs significantly affects overall environmental and resource reduction scores, suggesting that SCs in IBs may primarily drive symbolic (e.g., overall environmental and resource reduction scores) rather than substantive environmental efforts (e.g., environmentally-friendly products and innovations). In contrast, SC establishment shows a significant effect across all four dimensions of EI for conventional banks (CBs), underscoring its more comprehensive role in shaping environmental outcomes within CBs. These findings have important theoretical, practical, and policy implications for bank managers, regulators, and other key stakeholders.

Keywords: Sustainability committee, Environmental initiatives, Emerging markets, Dual banking systems, Islamic banks.

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I. INTRODUCTION

Environmental concerns has gained increasing prominence in recent years. Particularly, climate change and a broad range of environmental degradation represent some of the most critical threats currently confronting humanity (Issa & Zaid, 2023). Policymakers increasingly recognize the complex risks from climate change, spanning economic, social, and environmental dimensions, with implications for biodiversity preservation and long-term economic resilience (Altunbas et al., 2022).

In response to these escalating threats, corporate governance mechanisms have placed greater emphasis on the advisory role of the boardroom in enhancing environmental performance (Aguilera et al., 2021; de Villiers et al., 2011; Walls et al., 2012). This shift is increasingly institutionalized through the establishment of board-level sustainability committees (SCs), which serve to strategically drive the alignment of corporate operations with environmental objectives. These committees are central to shaping and implementing environmental management tools, promoting a sustainability-oriented culture, and developing industry-specific responses to emerging ecological challenges (Jo et al., 2015).

Beyond internal corporate governance, the financial sector also plays a pivotal role in addressing global environmental issues vis reduction in emissions across industries (Atlason et al., 2023). In particular, banks are increasingly recognized as key actors in the transition toward a low-carbon economy, given their ability to mobilize capital and direct investments toward sustainable initiatives (Liu et al., 2024; Khaer & Anwar, 2022). However, recent evidence shows that major banks continue to channel substantial financing into fossil fuel sectors, with the 60 largest banks providing USD 4.6 trillion between 2015 and 2021, reflecting a persistent gap between climate commitments and actual financial practices (Rainforest Action Network, 2022).

Efforts to promote sustainable business practices within the banking sector can be traced back to the mid-2000s, when stakeholders began demanding accountability from banks for carbon emissions associated with their financing activities (Dupré et al., 2013). In response to this growing pressure, the establishment of the Net Zero Banking Alliance (NZBA) in 2021 marked a coordinated global effort to align banking portfolios with net-zero targets. By 2024, the NZBA comprises more than 140 member banks managing assets of over US\$74 trillion, underscoring the sector's collective capacity to mobilize capital for decarbonization and climate change mitigation (UNEP, 2024).

Amid this global shift, Islamic banks (IBs) have been positioned as supportive actors in the global environmental and sustainability goals (ESG) movement due to their inherent alignment with sustainability-oriented values (Nasution et al., 2023). Rooted in *Maqasid al-Shariah*, IBs integrate environmental responsibility into their ethical and legal frameworks. Rather than treating sustainability as an external requirement, Islamic law intrinsically prioritizes the protection of life and the natural environment. The higher ethical objectives of Shari'ah entail the preservation and advancement of the value of human life, individual well-being, societal welfare, and the natural environment (Azmat & Subhan, 2022; Mergaliyev et al., 2021). Moreover, the key stakeholders of IBs rely considerably on Shari'ah governance structure to achieve *Maqasid al-Shariah* by ensuring environmental

adherence to established ethical principles (Boudawara et al., 2023; Sencal & Asutay, 2021). This conceptual alignment has been increasingly acknowledged in the literature and by international organizations, including UNEP (2023), as a basis for IBs' engagement in climate-related initiatives. While this commitment is a significant step forward, incorporating internal governance structures such as SCs could enhance its effectiveness. However, empirical research examining sustainability committees has largely centered on non-financial firms with mixed results (Berrone & Gomez-Mejia, 2009; Oyewo, 2023; García Martín & Herrero, 2020; Walls et al., 2012; Jaggi et al., 2018; Mallin & Michelon, 2011), paying little attention to the financial sector (Moussa, 2019).

Furthermore, IBs are predominantly concentrated in emerging economies, particularly the Gulf Cooperation Council (GCC) member countries. They are oil-abundant and fossil fuel-dependent economies where environmental risks, for instance, excessive carbon emissions, methane pollution, and water scarcity are pronounced (Sadriwala et al., 2024; Sharma et al., 2022). Moreover, emerging markets continue to face substantial environmental challenges from rapid urbanization (Abulibdeh et al., 2019), unsustainable natural resource depletion (Al-Saidi et al., 2019), and increasing water stress (Pirani & Arafat, 2016). Despite these challenges, several emerging economies have notable progress in advancing sustainability strategies; for instance, the Qatar National Vision 2030 (QNV2030) outlines a roadmap for achieving sustainable economic and environmental development in the country (State of Qatar, n.d.). Likewise, the United Arab Emirates Vision 2021 sets ambitious targets for waste treatment, renewable energy development, and water recycling, all contributing to the transition towards sustainability (United Arab Emirates, 2024). However, with the energy sector accounting for over 70% of global carbon emissions (IEA, 2022), dependence on oil and gas perpetuates the region's high carbon footprint, making it vulnerable to climate change and fluctuations in global oil prices that may affect its sustainability governance mechanisms.

Our study investigates the relationship between SCs and environmental initiatives (EI). Using a panel of 85 banks from 12 countries over the period 2012–2024, comprising 21 IBs and 64 conventional banks (CBs), we employ panel regressions for the purpose. The finding reveals that the presence of an SC is positively associated with overall environmental scores, environmental products, environmental innovation, and resource reduction among emerging market banks, with stronger effects observed in CBs.

This study offers several key contributions to the field. First, it extends the literature on sustainability governance in the banking sector by examining the relationship between the presence of a sustainability committee and environmental initiatives, a link that has been extensively studied in non-financial firms but rarely in banks. Second, this study extends the legitimacy and stakeholder theory by showing that the influence of sustainability committees varies depending on the source of legitimacy pursued by organizations, particularly in dual banking systems, where religious and social legitimacy coexist, and by highlighting how different stakeholder structures in IBs and CBs shape the effectiveness of sustainability governance mechanisms. Specifically, the weaker effect observed in IBs suggests that sustainability governance operates within a dual legitimacy

framework, where religious legitimacy derived from Sharia compliance interacts with broader social legitimacy. The results also provide insights into symbolic action in sustainability governance, as some EIs—particularly those related to operational adjustments—may primarily serve as signals of environmental commitment rather than substantive changes to core banking activities.

Third, this study complements the work of Agnese et al. (2023), which examines the presence of sustainability committees of CBs in general; this study expands the scope of analysis to include IBs. Incorporating Islamic banks not only broadens the empirical base but also enables a comparative analysis of CBs and IBs. This is particularly valuable as IBs operate under a distinct ethical and legal framework, rooted in *Maqasid al-Shariah*, that may influence their approach to environmental sustainability. By examining these two banking models, the study provides a richer and more comprehensive perspective on the role of SCs across diverse institutional contexts. Fourth, while Tumewang et al. (2025) and Issa et al. (2025) compare IBs and CBs and find that SCs are linked to higher ESG performance and support emissions mitigation, they do not focus specifically on EIs. This study addresses that gap by using detailed environmental data from the Refinitiv database. It examines not only the overall environmental performance score but also disaggregated indicators of three core components: emissions, environmental innovation, and resource use. This multidimensional approach allows for a deeper understanding of the specific environmental activities and outcomes linked to SCs.

Finally, since the majority of existing empirical evidence originates from developed economies, including the United States (Bui et al., 2020; Dixon-Fowler et al., 2017; Liu, 2024; Mahoney et al., 2013; Velte, 2024), European countries (Alodat et al., 2025; Beji et al., 2021; García Martín & Herrero, 2020; Gürbüz & Gürbüz, 2025; Morrison et al., 2025), the United Kingdom (Liao et al., 2015), and Australia (Biswas et al., 2018; Li et al., 2023), their results may not be extended to emerging economies as their financial markets are generally less mature, more fragmented, and often prioritizes economic growth over environmental impact, which can often cause environmental degradation and depletion of natural resources (Asif, 2016). Emerging markets also exhibit distinct political, cultural, and social dynamics that may shape the governance role of SCs. This study addresses this gap by examining banks in emerging economies, capturing context-specific factors influencing their effectiveness as a governance mechanism.

The remainder of the article is structured as follows: Section 2 reviews the literature on SCs and EIs, leading to the study's hypotheses. Section 3 describes data, sampling, and empirical models. Section 4 reports and discusses the regression results. Section 5 concludes with key findings, implications, and limitations.

II. LITERATURE REVIEW

2.1. Stakeholder Theory

The present study integrates the stakeholder theory and legitimacy theory to examine the relationship between SCs and EIs. The stakeholder theory, initially proposed by Freeman (1984), posits that firms are expected to address the interests of multiple stakeholders. It emphasizes that firms must consider all stakeholder groups—not just shareholders—when making decisions (Rao & Tilt, 2016; Mensah

& Bein, 2023). In the banking industry, the key stakeholders typically include shareholders, customers, employees, regulators, creditors, and local communities, all of whom directly influence and are affected by bank's operations and strategic decisions. Given that stakeholder expectations often differ and can even conflict, managing these interests requires thoughtful balance (Fernando & Lawrence, 2014).

Ngatia (2014) explains that the theory's core aim is to align corporate activities with stakeholders' expectations on financial performance, social responsibility, environmental stewardship, and governance transparency. In practice, particularly in environmental matters, this alignment is facilitated through the establishment of SCs at the board level, which plays a pivotal role in driving strategic transformation (Boivie et al., 2021). By overseeing environmental strategies, monitoring progress, and facilitating transparent public reporting, SCs play a pivotal role in ensuring environmental accountability (Liao et al., 2015). The presence of an active SC is often associated with credible environmental disclosures, which, in turn, is positively reflected in external environmental performance ratings—metrics that encompass emissions, waste, water usage, and biodiversity considerations (Velte & Stawinoga, 2020).

Most studies on environmental actions employ aggregated indicators, which potentially obscure variance, materiality weight, and sector-specific variance, potentially resulting in a 'black box' phenomenon that hides specific environmental actions (Berg et al., 2022; Faqera et al., 2026). In investigating the role of SCs in EIs, merely aggregating environmental pillars would affect the initiative it influences. Current ESG ratings from Revinitiv (LSEG) have composited EIs among environmental products, environmental innovation, and resource reduction. Adopting a disaggregated approach helps identify specific actions that institutions may take, such as which indicators dual banking systems have already advanced, and which need attention. For banks, environmental actions mostly manifest in the form of lending portfolios, thus having detailed indicators provides precise and empirical views into the manner in which governance mechanisms respond to stakeholder and legitimacy pressures, and aiming for quantifiable environmental outcomes, rather than to general sustainability signals (Chiaramonte et al., 2022; Ersoy et al., 2022). Therefore, using disaggregated environmental indicators is necessary to gain empirical insight and to address stakeholders' concerns.

Recent research shows a growing stakeholder demand for stronger climate governance (Tingbani et al., 2020). In addition, Rodrigue et al. (2013) describe climate governance as an expansion of boards' responsibilities to include carbon planning, environmental systems, and formal SCs. Within the stakeholder theory, such practices help managers respond to environmental expectations while supporting broader accountability (Peng & Isa, 2020).

Furthermore, stakeholders increasingly expect firms to demonstrate responsible resource use. This pressure has led organizations to adopt measures aimed at reducing energy intensity, water usage, and material consumption. SCs play a central role in these measures by allocating capital to efficiency initiatives, setting measurable reduction goals, and disclosing outcomes to promote accountability (Burke et al., 2019). These practices operationalize normative stakeholder demands into actionable strategies that simultaneously yield cost savings and reduce ecological impact (Hussain et al., 2018).

2.2. Legitimacy Theory

This study also incorporates the legitimacy theory, given the increasing societal focus on climate change mitigation. The theory provides a robust explanatory framework for understanding how and why banks adopt sustainability and environmental initiatives. The legitimacy theory has become central in explaining corporate sustainability behavior, including in the banking industry. According to Suchman (1995), legitimacy reflects the extent to which people see an organization's actions aligned with current societal norms, values, beliefs, and ideas in a specific social setting. The theory posits that organizations operate within a broader social system and their survival depends on maintaining congruence between organizational actions and the expectations of that system (Dowling & Pfeffer, 1975; Deegan, 2002). In this regard, legitimacy functions as a form of intangible capital that enables firms to secure critical resources, attract investors, and maintain their "license to operate" (Pfeffer & Salancik, 1978; Oliver, 1991).

From an efficiency perspective, the legitimacy theory suggests that organizations can enhance both legitimacy and performance by engaging in cost-effective sustainability practices that deliver measurable environmental outcomes (Mazouz & Zhao, 2019; Haque & Ntim, 2020). In the banking sector, this involves financing low-carbon projects, integrating climate risk into credit assessments, and reducing financed greenhouse gas emissions (GHGE). Such practices reflect a substantive approach, where legitimacy is achieved through genuine alignment with environmental objectives (Orazalin et al., 2024).

Conversely, the social legitimacy perspective highlights that firms may pursue legitimacy through symbolic actions that conform to societal norms without significantly altering operational activities (Ashforth & Gibbs, 1990). In banking, such symbolic strategies include expanding sustainability disclosures, forming SCs, or adopting high-profile green policies without embedding them in lending portfolios or risk management processes (Aguilera et al., 2007; Berrone & Gomez-Mejia, 2009). These practices are closely associated with corporate greenwashing, where firms project an image of environmental responsibility that is not fully supported by underlying actions.

Furthermore, this divergence between symbolic representation and substantive implementation can be understood by examining organizational decoupling, whereby formal policies are disconnected from actual practices (Manning et al., 2019). In this context, banks may adopt symbolic sustainability policies/disclosures while maintaining the conventional and carbon-intensive financing activities. These initiatives can improve perceptions among stakeholders including regulators, customers, and investors, without necessarily achieving substantive environmental outcomes. As a result, it creates a legitimacy-performance gap, particularly in sectors where disclosure requirements are more visible than actual environmental impact (Manning et al., 2019).

In practice, the legitimacy theory implies that banks may strategically deploy EIs to manage external perceptions and safeguard their competitive positions. Enhanced sustainability disclosures, for example, can help banks demonstrate accountability and transparency, which are critical for maintaining public trust (Adu et al., 2023; Crossley et al., 2021). However, without robust governance mechanisms such as clear executive incentives for climate performance or

third-party assurance of ESG reports, these disclosures risk becoming a form of greenwashing rather than evidence of substantive environmental commitment (Haque & Ntim, 2020).

Finally, the legitimacy theory highlights the tension between the need to meet societal expectations and the potential for organizations to rely on image management to achieve legitimacy. This theoretical perspective is particularly relevant for assessing whether board-level sustainability structures in banks, such as SCs, serve as genuine drivers of environmental performance or merely as symbolic gestures to maintain legitimacy.

2.3. Prior Studies and Hypotheses Development

2.3.1. Sustainability Committee and Environmental Initiatives

Driven by increasing demand for sustainability, companies have formalized internal governance mechanisms in managing their environmental and social responsibilities. One such mechanism is establishing an SC at the board level to oversee and monitor the implementation and integration of sustainability-related practices. From the stakeholders' standpoint, through its active oversight and monitoring, SCs are crucial for meeting the needs of stakeholders where the demands for sustainability disclosure increase (Burke et al., 2019; Kılıç et al., 2021).

Although SCs have been widely established by many large firms, empirical evidence regarding their effectiveness in addressing greenwashing remains inconclusive. Some studies suggest that the mere presence of SCs may be largely symbolic, potentially intensifying greenwashing practices (Pratama et al., 2025). Moreover, a study by Orazalin et al. (2024) on non-financial companies around the world also shows that the presence of a board-level SC has a positive impact on the firms' value but does not affect outcome-based carbon performance, implying that it still has not reached the expected performance of environmental practices. In other words, firms are likely to employ process-based climate change initiatives under a symbolic approach merely to impress stakeholders.

In contrast, Li et al. (2023) demonstrate that there is a positive relationship between SCs and environmental performance within Australian firms, indicating that SC composition and function play a role in enhancing environmental performance. In their study, Driss et al. (2024) also highlight the importance of SCs in engaging higher-quality GHGE disclosure in international firms from 35 countries, implying that SCs play a crucial role in tackling greenwashing/decoupling practices.

In existing studies, SCs are also found to play a moderating role. Alodat et al. (2025) note that SCs moderate the relationship between ESG performance and environmental innovation, which aligns with sustainability goals. Gull et al. (2024) also find that SCs, particularly their diversity and independence, narrow the gap between firms' actual and disclosed environmental performance, turning environmental disclosure into actual practice.

Prior studies have explored SCs mostly in non-financial firms where SCs act as a moderating variable in affecting financial outcomes, enhancing ESG disclosure quality, and improving environmental performance (Gürbüz & Gürbüz, 2025; Li et al., 2023; Orazalin et al., 2024). Those studies reinforce the strategic value of SCs

as a governance mechanism to strengthen firms' environmental accountability. However, other studies document mixed results. For instance, Berrone & Gomez-Mejia (2009) report no significant relationship between SCs and environmental performance among US firms, while Oyewo (2023) find that ESG committees are negatively linked to carbon emission rates of multinational companies. Despite the effectiveness of SCs in accomplishing EIs, this relationship still varies depending on the environmental strategies employed, demonstrating the need for a tailored approach in different sectors (Soana, 2024).

In terms of financial companies, due to their intermediary roles potentially more exposed to sustainability and financial risks (Uyar et al., 2022), the studies of SCs impact on EIs are limited. Tumewang et al. (2025) find that SCs are important for ESG performance in banks. Additionally, Orazalin et al. (2024) find that SCs play a moderating role in shaping Corporate Social Responsibility (CSR) performance and financial stability. While studies in financial companies reveal that SCs play a role in improving ESG performance in general, few studies address the role of SCs in EIs in specific, as they mostly explore the determinants influencing the ESG or sustainability reporting such as the role of audit committee (Buallay & Al-Ajmi, 2020); the role of sustainability reporting towards bank performance (Buallay, Fadel, Alajmi, & Saudagaran, 2021), and the extent of IBs in disclosing sustainability activities (Abu Al-Haija et al., 2021; Al Adawiyah et al., 2025; Jan et al., 2021). EI is one of the components of ESG, reflecting the company's actual performance on environmental concerns, making the study of the role of SCs towards EIs imperative.

Drawing upon the stakeholder theory as well as existing empirical findings that SC has an association with environmental performance (Driss et al., 2024; Li et al., 2023; Orazalin, 2020; Rini, 2024; Tumewang et al., 2025), it is expected that the presence of SCs positively influences the EIs. We thus propose the following hypotheses:

H1. The presence of SCs is positively associated with EIs in banking systems.

2.3.2. Sustainability Committees and Environmental Initiatives in Conventional and Islamic Banks

From the perspective of the stakeholder theory (Freeman, 1984), companies are expected to create value for a more extensive range of stakeholders, including those related to or affected by environmental sustainability. In IBs, this responsibility is stronger as it is embedded in the unique characteristics of Islamic banking itself, which involves a deeper layer of religious and ethical stakeholders demanding adherence to Sharia principles, including the prohibition of usury and a pledge of social justice (Alfiansyah & Nisa, 2024; Dusuki & Abdullah, 2007; Najid et al., 2024). Given the Islamic tenets, green banking practices allow IBs to effectively promote green products to Muslim consumers, thereby boosting engagement (Bukhari et al., 2020). This is consistent with the stakeholder theory, as IBs can address both religious and environmental stakeholder demands. Consequently, SCs in IBs are likely to more vigorously protect the environment to meet their stakeholders' ethical and environmental expectations.

From a legitimacy perspective, companies attempt to maintain their legitimacy through conforming their operations to public norms and values. For IBs, legitimacy is conceptualized as a dual-layered construct: religious legitimacy, defined by adherence to Sharia principles (Abedeem & Salman, 2024), and social legitimacy, aligned with global sustainability agendas such as ESG frameworks and green finance guidelines. This dual pursuit of legitimacy intensifies institutional pressures on IBs to adopt environmental engagement practices. Practically, as the presence of SCs in IBs remains limited, ESG and CSR disclosure for IBs is frequently governed by the composition of the relevant Sharia Supervisory Boards (SSBs), the size, independence, and cross-membership of the SSB, which ensure the sustainability initiatives are in line with religiously acceptable norms, enhancing Muslim stakeholders (Farook et al., 2011; Wijayanti & Setiawan, 2023).

Empirical studies on dual banking systems show that IBs are more strongly oriented towards EIs. For instance, in Bangladesh, as in other developing economies, Julia & Kassim (2019) find that IBs are more committed to green banking policies than CBs; however, neither type of bank fully meets the sustainability requirements. The commitment to sustainability of Bangladeshi IBs is also depicted in their focus on energy savings and natural resource preservation (Uddin & Ahmmed, 2018). Another study also shows IBs' devotion to green practices by utilizing green sukuk and climate financing (Utomo et al., 2024), indicating that IBs have a great concern for EIs. Furthermore, previous studies indicate that SCs make a substantial contribution to sustainability performance, with a stronger impact observed in IBs compared to CBs (Tumewang et al., 2025). CBs' sustainability practices tend to be compliance-oriented, whereas IBs' sustainability practices are based on moral and ethical values, resulting in greater accordance with sustainable development and EIs.

In contrast, while CBs also align with the stakeholder and legitimacy theories, the practices are often driven by regulatory standards and reputational concerns, without the added concern for religious legitimacy (Buallay, Al Hawaj, & Hamdan, 2021). However, in comparing CBs and IBs, studies have not found a significant difference in terms of sustainable banking performance, recommending that both types of banks are equally committed to sustainability practices (Karisma & Rani, 2023). This necessitates further exploration and hence our hypothesis:

H2. The positive impact SCs on EIs in IBs is more pronounced than in CBs due to the dual pursuit of social and religious legitimacy.

III. METHODOLOGY

3.1. Data and Sample

In line with Mollah et al. (2017) and Tumewang et al. (2025), this study focuses on emerging economies with dual banking systems, where CBs and IBs operate alongside each other. Data for EIs for IBs in the Eikon Refinitiv Database are limited, where we obtain them from only 21 full-fledged IBs. We exclude Islamic banking windows from the analysis because they operate as Islamic business units within conventional banks and generally follow organizational structures, governance arrangements, and reporting systems that are closely aligned with their parent CBs.

The final dataset comprises 85 banks (21 IBs and 64 CBs) across 12 countries spanning from 2012 to 2024 for a total of 670 bank-year observations. The period covered is dictated by the availability of data for IBs included in the sample. Table 1 shows the country-wise distribution of our sample, while Table 2 depicts the sample selection process from the initial stage to the final dataset.

Table 1.
Country-Wise Sample Distribution

Country	Total Number of Banks	Islamic Banks	Conventional Banks	Obs	Percent
Bahrain	5	3	2	25	3.73%
Egypt	2	1	1	23	3.43%
Indonesia	18	4	14	103	15.37%
Jordan	4	1	3	31	4.63%
Kuwait	4	1	3	46	6.87%
Malaysia	10	1	9	108	16.12%
Oman	6	1	5	52	7.76%
Pakistan	8	3	5	36	5.37%
Qatar	5	1	4	50	7.46%
Saudi Arabia	5	2	3	62	9.25%
Turkey	7	1	6	67	10.00%
United Arab Emirates	11	2	9	67	10.00%

Source: Author's calculation

Table 2.
Sample Selection

	No. of observations
Initial firm-year observations	1,105
Less: observations with unavailable ESG data on Refinitiv	420
Less: observations with insufficient financial data	15
Final sample	670

3.2. Measurement of Variables

Table 3 provides the definitions measurements, and data sources of the variables. For the dependent variable, we employ four indicators of EI - the overall environment, environmental products, environmental innovations, and resource reduction scores (Chiaramonte et al., 2022; Chiaramonte et al., 2024). Meanwhile, for the independent variable, we utilize the dummy variable of SCs, which is in line with prior literature (Driss et al., 2024; Orazalin et al., 2024; Tumewang et al., 2025).

Table 3.
Definition and Source of Variables

Variables names	Symbol	Explanations	Sources
Dependent variables			
Environmental pillar score	Env_Overall	This is an overall environmental score measuring the adoption of environmental practices	Refinitiv Eikon
Environmental Product Score	Env_Product	"Environmental product score is a composite score measuring the creation of product and/or services that have positive environmental impacts"	Refinitiv Eikon
Environmental Innovation Score	Env_Innov	"Environmental innovation score is a composite score measuring the engagement in environmental innovation financing practices"	Refinitiv Eikon
Resource Reduction Score	Resource_Red	"Resource reduction policy is a composite score measuring banks' resource reduction practices"	Refinitiv Eikon
Independent variables			
Sustainability Committee	SC	"A dummy variable indicating the presence of Sustainability Committee on the board, where a value of 1 is assigned when company has Sustainability Committee, otherwise 0"	Refinitiv Eikon
Moderating variable			
Islamic Bank	IB	"A dummy variable that takes 1 if the bank is Islamic"	Annual Report
Control variables			
<i>Governance-specific variables</i>			
Board Size	bsize	"Total number of BOD members"	Refinitiv Eikon
Board Independence	bind	"The number of independent directors scaled by total BOD members"	Refinitiv Eikon
Board Gender Diversity	bdiv	"The number of women directors scaled by total BOD members"	Refinitiv Eikon
Board Meetings	bmeet	"Total number of BOD meetings"	Refinitiv Eikon
<i>Bank-specific variables</i>			
Firm Size	fsize	"Natural logarithm of total asset"	Refinitiv Eikon
Return on Assets	roa	"The percentage of net income to total assets"	Refinitiv Eikon
Capital Intensity	capin	"The percentage of property, plant, and equipment to total assets"	Refinitiv Eikon
Leverage	lev	"The ratio of debt to total assets"	Refinitiv Eikon
<i>Country-specific variables</i>			
Gross Domestic Product	gdp	"National GDP growth per year"	World Bank Database
Inflation	inf	"National inflation growth per year"	World Bank Database

Source: Author's compilation

As for the control variables, the study uses financial-, governance-, and country-level variables deemed to affect EIs. Bank-specific indicators include firm size, return on assets, capital intensity, and leverage ratios (Issa, 2024; Velte, 2024). For corporate governance indicators, the study considers board size, board independence, board gender diversity, and board meeting frequency (Bhuiyan & Hooks, 2016; Tumewang et al., 2025). Many existing studies (Cordeiro & Tewari, 2015; Farza et al., 2021; García Martín & Herrero, 2020) document the effects of both financial and governance metrics on environmental initiatives. Lastly, to account for the confounding effect of country-level characteristics that might affect EIs, this study employs the country's inflation and GDP as control variables, consistent with previous literature (Orazalin, 2020; Simsek et al., 2024).

3.3. Empirical Models

Building on previous studies (Ali et al., 2023; Luo & Tang, 2023), we employ panel data regressions to investigate the relationship between sustainability committees and environmental initiatives (H1-H4). Based on the results of the Hausman test, fixed-effects panel regression is most suitable. In line with earlier literature (Choi & Luo, 2021; Haque & Ntim, 2022), we include year and country dummy variables to control for time- and country-specific effects. The same regression analyses are applied to both the IB and CB subsamples across all models. To further validate the findings, we also conducted a series of robustness checks, including analyses with alternative measures as well as 2SLS, and GMM regressions (Ding et al., 2023; Tumewang et al., 2024). The SCs may be potentially endogenous for several reasons. First, there may be reverse causality, whereby banks with more ambitious EIs are more likely to adopt and disclose stronger SC practices. Second, omitted variable bias could arise if unobserved bank characteristics (e.g., managerial quality, risk culture, or strategic orientation) affect both SCs and EIs. To address these concerns, we implement 2SLS using the first and second lags of SC as the instrumental variables. This approach allows us to mitigate the potential endogeneity of SC and provide more credible estimates of its causal impact.

Our model specification is:

$$EI_{it} = \beta_0 + \beta_1 SC_{it} + \sum_{i=2}^n \beta_i CONTROLS_{it} + \sum_{i=1}^n \beta_n Country\ Fixed\ Effect_{it} + \sum_{i=1}^n \beta_n Year\ Fixed\ Effect_{it} + \delta_t + \varepsilon_{it} \quad (1)$$

where EI represents the environmental initiatives, which include the overall environmental score, the environmental product score, the environmental innovation score, the resource reduction score. SC represents the sustainability committee for bank i in year t ; β_i are the coefficients to be estimated and ε_{it} as the error term.

3.4. Descriptive Statistics and Correlation Matrix

Table 4 shows the descriptive statistics. The t-test results show that all four measures of EIs and SCs are significantly higher in CBs. For the control variables, the t-test reveals that all governance characteristics of IBs are significantly different from those of CBs, except for board size. Meanwhile, for the bank-specific control variables, the t-test shows that only the firm size of CBs is significantly different from that of their conventional counterparts.

Descriptive statistics further indicate that the average EI score across the full sample is relatively low, particularly among Islamic banks, which register scores below 50 out of 100. This finding is consistent with prior studies (Boudawara et al., 2023; Jan et al., 2023) that have identified a limited focus by IBs' on environmental concerns. In both bank types, the lowest-performing indicator is the environmental innovation score. In terms of the independent variable, 59.7% of CBs have a dedicated sustainability committee, compared with only 41.3% of IBs. Further, the t-test shows that the means of SC for both types of banks are significantly different.

Moreover, as presented in the correlation matrix (Table 5), the four environmental initiative indicators are positively associated with the presence of an SC. According to Gujarati (2004), multicollinearity may be a serious concern when the correlation coefficients between predictors exceed the 0.80 threshold. In our study, the Pearson correlation results show that none of the coefficients exceed this threshold, except those between the overall environmental score and its sub-dimensions (i.e., environmental innovation score), which is expected. Moreover, Variance Inflation Factor (VIF) values are below the commonly accepted threshold of 10, indicating no problematic multicollinearity among variables (Table 5).

Table 4.
Descriptive Statistics

Variable	Full Sample					Islamic Banks					Conventional Banks					Paired t-test	
	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	Obs	Mean	Std. Dev.	Min	Max	t-stat	p-value
Env_Overall	670	37.799	27.279	0	97.286	126	22.498	22.042	0	85.045	544	41.342	27.167	0	97.286	7.25***	
Env_Product	670	44.125	37.885	0	84.032	126	35.642	37.595	0	84.032	544	46.089	37.715	0	84.032	2.8***	
Env_Innov	670	26.727	30.339	0	97.547	126	16.845	24.305	0	80.525	544	29.016	31.148	0	97.547	4.1***	
Resource_Red	670	55.786	28.060	1.116	78.578	126	49.479	30.577	1.116	78.578	544	57.246	27.266	1.116	78.578	2.81***	
SC	670	0.563	0.496	0	1	126	0.413	0.494	0	1	544	0.597	0.491	0	1	3.8***	
bsize	670	9.579	2.309	3	18	126	9.325	2.419	3	17	544	9.638	2.280	3	18	1.37	
bind	670	45.310	21.283	0	100.000	126	38.236	22.667	0	90.909	544	46.948	20.627	0	100	4.19***	
bdiv	670	10.439	11.880	0	57.143	126	7.097	11.157	0	50	544	11.213	11.918	0	57.143	3.53***	
bmeet	670	13.087	12.593	3	89	126	8.667	4.690	3	28	544	14.110	13.592	3	89	4.43***	
fsize	670	24.064	1.249	19.466	26.599	126	23.440	1.386	19.533	26.281	544	24.208	1.170	19.466	26.599	6.39***	
roa	670	0.042	0.027	0.010	0.343	126	0.043	0.034	0.012	0.246	544	0.042	0.026	0.010	0.343	-0.69	
capin	670	0.011	0.008	0.001	0.066	126	0.012	0.007	0.002	0.037	544	0.011	0.009	0.001	0.066	-1.39	
lev	670	0.915	1.268	0	15.342	126	1.006	1.317	0	6.970	544	0.894	1.257	0.000	15.342	-0.89	
gdp	670	3.659	3.171	-8.855	11.354	126	3.000	3.055	-4.712	11.354	544	3.811	3.181	-8.855	11.354		
inf	670	4.851	9.371	-2.540	72.310	126	4.767	9.586	-2.540	72.310	544	4.870	9.329	-2.540	72.310		

Table 5.
Correlation Matrix

	Env_ Overall	Env_ Product	Env_ Innov	Resource_ Red	SC	bsize	bind	Bdiv	bmeet	fsize	roa	capin	lev	gdp	inf	vif
Env_ Overall	1															-
Env_ Product	0.712**	1														2.37
Env_ Innov	0.902**	0.706***	1													2.72
Resource_ Red	0.538**	0.519***	0.430**	1												1.58
SC	0.512**	0.453***	0.466**	0.448**	1											1.60
bsize	0.135**	0.0602	0.164**	-0.0325	0.152***	1										1.36
bind	0.0874*	0.0178	0.0704	0.110*	0.0974*	-0.207**	1									1.16
bdiv	0.273**	0.193**	0.313**	0.125*	0.130**	-0.128**	0.176**	1								1.25
bmeet	0.291**	0.207**	0.225**	0.159**	0.150**	-0.0733	0.0697	-0.0240	1							1.20
fsize	0.468**	0.278**	0.382**	0.236**	0.358***	0.281**	0.0948*	-0.0354	0.225**	1						1.59
roa	0.0385	-0.0107	0.0363	0.122*	-0.0563	-0.277**	0.0128	0.159**	0.0802*	-0.283**	1					1.32
capin	0.00663	0.0682	0.0704	0.0764*	-0.148**	-0.00360	-0.0726	-0.0533	0.128**	-0.165**	0.259**	1				1.20
lev	0.127**	0.107**	0.179**	0.00236	-0.0323	0.190**	-0.146**	0.0174	0.0842*	-0.0434	-0.0421	0.103**	1			1.16
gdp	0.136**	0.0580	0.117*	0.0776*	0.0353	-0.0840*	0.106*	0.142**	0.128**	0.0491	0.104**	0.012	0.086*	1		1.11
inf	0.219**	0.113*	0.240**	0.0370	0.100*	0.132**	-0.149**	0.0671	0.160**	0.0124	0.125**	0.107**	0.206**	0.210**	1	1.22

* $p < 0.05$, ** $p < 0.01$, *** $p < 0.001$

IV. RESULTS AND ANALYSIS

4.1. Main Regression Results

Table 6 reports the fixed-effect regression results for the full sample (Columns 1-4), followed by the sub-samples of Islamic banks (Columns 5-8) and conventional banks (Columns 9-12), respectively. The finding demonstrates that the sustainability committee is positively associated with the overall environmental score at a 1% level of significance (Column 1, Table 5), implying that emerging market banks with a sustainability committee exhibit higher environmental initiatives. Furthermore, similar results (significantly positive at 1% levels) are also observed when considering environmental products, environmental innovations and resource reduction scores (Columns 2-4, Table 5).

The results suggest that a designated committee for addressing sustainability issues will drive banks to offer more environmental products, to be more environmentally innovative, and to engage in greater resource reductions. These findings support previous studies documenting that SCs are an effective tool for better environmental performance (Biswas et al., 2018; Li et al., 2023; Orazalin, 2020). Particularly in the context of the banking industry, several studies (Allodi & Soana, 2025; Birindelli et al., 2018) demonstrate that the establishment of SCs would be effective in stimulating banks to be more environmentally responsible. From a stakeholder theory perspective, we argue that such governance structures reflect an organization's responsiveness to the expectations and demands of diverse stakeholder groups, including customers, investors, regulators, and the wider community, who increasingly prioritize environmental stewardship (Burke et al., 2019). At the same time, the adoption of these mechanisms is consistent with the legitimacy theory, as it helps banks maintain or enhance their social license to operate by demonstrating alignment with society's values and expectations pertaining to environmental responsibility (Velte & Stawinoga, 2020). Overall, the findings indicate that the establishment of SCs is positively associated with environmental initiatives of the banks, implying the support for H1.

When CBs and IBs are analyzed separately, the results indicate that the positive association between SCs and the overall environmental score is more pronounced in CBs than in IBs, leading to the rejection of H2. This finding is somewhat unexpected, as IBs are theoretically expected to demonstrate a stronger commitment to broader social and ethical objectives embedded in Islamic finance principles.

From a stakeholder theory perspective, CBs are subject to stronger and more direct pressure from a wide range of stakeholders, including institutional investors, regulators, customers, and civic organizations who increasingly demand improved environmental performance and transparency (Simsek et al., 2024). In response to these expectations, the establishment of SCs can function as a governance mechanism that signals commitment to environmental responsibility and enhances accountability in environmental decision-making.

Table 6.
Main Regression Results

VARIABLES	Full Sample				Islamic Banks				Conventional Banks			
	Env_ Overall	Env_ Product	Env_ Innov	Resource_ Red	Env_ Overall	Env_ Product	Env_ Innov	Resource_ Red	Env_ Overall	Env_ Product	Env_ Innov	Resource_ Red
SC	12.81*** (1.779)	21.03*** (3.245)	9.851*** (2.035)	19.64*** (2.324)	8.104** (3.933)	3.101 (7.519)	3.896 (4.744)	19.50*** (5.231)	14.37*** (2.081)	26.24*** (3.720)	12.50*** (2.403)	19.52*** (2.807)
bsize	-0.389 (0.372)	-0.793 (0.593)	-0.148 (0.430)	-0.600 (0.460)	-2.210** (1.068)	-3.705 (2.248)	-3.348*** (1.208)	3.030* (1.534)	-0.533 (0.413)	-1.568** (0.661)	-0.166 (0.481)	-0.990* (0.506)
bind	0.0480 (0.0387)	-0.131* (0.0752)	0.0163 (0.0448)	0.100** (0.0501)	0.0550 (0.0826)	0.0542 (0.184)	-0.0286 (0.102)	0.0965 (0.126)	0.0757 (0.0504)	-0.0523 (0.0850)	0.0803 (0.0568)	0.122* (0.0627)
bdiv	0.193** (0.0763)	0.0903 (0.127)	0.357*** (0.0863)	-0.280*** (0.0960)	0.134 (0.200)	-0.492 (0.466)	0.265 (0.237)	0.257 (0.270)	0.269*** (0.0838)	0.228* (0.134)	0.451*** (0.0961)	-0.330*** (0.109)
bmeet	-0.112* (0.0673)	0.219** (0.0994)	-0.160* (0.0900)	-0.141** (0.0670)	-0.0261 (0.552)	1.204 (1.260)	0.198 (0.721)	-0.361 (0.798)	-0.0769 (0.0677)	0.203** (0.0994)	-0.145 (0.0905)	-0.166** (0.0698)
fsize	10.08*** (0.797)	9.496*** (1.407)	11.36*** (0.964)	2.292*** (0.875)	9.585*** (2.895)	15.99*** (5.651)	11.64*** (3.719)	-4.348 (3.499)	9.688*** (0.996)	7.518*** (1.762)	10.89*** (1.196)	2.519** (1.018)
roa	43.85 (28.08)	-19.01 (49.03)	16.13 (33.72)	81.87*** (28.07)	10.68 (29.85)	162.8 (104.2)	-43.02 (36.39)	-10.29 (51.36)	62.21 (38.69)	-85.62* (46.96)	41.08 (40.60)	90.57*** (30.75)
capin	164.7 (122.6)	83.99 (186.0)	167.9 (142.7)	97.09 (112.8)	-195.2 (291.6)	-1,247* (634.6)	-371.8 (347.5)	-14.30 (381.6)	194.9 (140.1)	224.0 (204.0)	245.8 (161.0)	86.38 (117.3)
lev	1.483* (0.819)	0.165 (1.110)	1.578* (0.943)	-0.809 (1.019)	-1.493 (1.659)	-5.563 (3.506)	-1.703 (2.069)	-8.375** (3.306)	1.564* (0.919)	0.148 (1.226)	1.435 (1.051)	0.708 (0.918)
gdp	-0.0407 (0.233)	-0.131 (0.403)	0.0273 (0.274)	-0.101 (0.276)	-0.223 (0.556)	0.827 (1.005)	-0.614 (0.701)	0.362 (0.652)	-0.0850 (0.253)	-0.262 (0.453)	0.0608 (0.298)	-0.386 (0.291)
inf	-0.109 (0.129)	-0.174 (0.122)	-0.143 (0.134)	-0.217 (0.148)	-0.261* (0.155)	-0.243 (0.318)	-0.265 (0.175)	-0.00504 (0.212)	-0.184 (0.138)	-0.267** (0.120)	-0.225 (0.141)	-0.227 (0.186)
Year Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Country Fixed Effect	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES	YES
Constant	-234.2*** (18.25)	-230.2*** (32.31)	-279.9*** (22.36)	-51.77** (20.74)	-187.0*** (57.76)	-357.1*** (109.7)	-230.2*** (72.92)	40.87 (70.25)	-215.9*** (23.43)	-157.1*** (40.35)	-263.7*** (28.09)	-41.54* (24.38)
Observations	670	670	670	670	126	126	126	126	544	544	544	544
R-squared	0.616	0.418	0.568	0.411	0.670	0.534	0.598	0.650	0.612	0.451	0.593	0.432

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

From the perspective of legitimacy theory, environmental governance structures may also serve different legitimacy functions across bank types. For CBs, environmental performance is closely tied to social legitimacy, where alignment with societal expectations and global sustainability norms helps protect a firm's reputation and maintain its license to operate. In this context, SCs are important institutional arrangements that allow banks to respond to environmental pressures and demonstrate alignment with the broader sustainability agenda (Li et al., 2023; Rodrigue et al., 2013).

For IBs, however, the primary source of legitimacy often lies in religious legitimacy, which is anchored in compliance with Sharia principles and supervised by Sharia governance bodies such as SSBs. These institutional structures play a central role in ensuring adherence to Islamic financial principles and may therefore dominate governance priorities. As a result, governance mechanisms specifically dedicated to environmental oversight, such as SCs, may receive less strategic emphasis compared to Sharia compliance mechanisms. This institutional arrangement may partially explain why SCs appear to exert a weaker influence on environmental performance in IBs.

This finding is consistent with prior studies suggesting that, despite the strong ethical foundations of Islamic finance, the operational focus of many Islamic financial institutions tends to prioritize formal Sharia compliance over the broader objectives of *Maqasid al-Sharia*, which include social and environmental welfare (Jan et al., 2019; Mergaliyev et al., 2021). Consequently, environmental governance structures may not yet be fully integrated into the core governance architecture of IBs.

Furthermore, when examining the other three environmental indicators more closely, the positive and significant coefficients remain consistent across all models for CBs (*Env_Product*, *Env_Innov*), whereas for IBs, such significance is evident in only one model (*Resource_Reduc*). As argued by Furrer et al. (2012), organizations may be perceived as engaging in symbolic actions when the EIs they implement have only a minimal impact on their core value creation processes. For the banking sector, the fundamental drivers of value are primarily embedded in their financing and investment operations, which could be more meaningfully demonstrated through the development of environmentally friendly financial products, the incorporation of green financing schemes, or the adoption of innovative environmental solutions, which are more evident in the CBs in this study. In contrast, initiatives confined to operational adjustments, such as reducing electricity consumption or introducing paperless banking, are unlikely to significantly alter a bank's overall capability portfolio. Consequently, these actions can be characterized as largely symbolic in nature (Aravind & Christmann, 2011; Fiss & Zajac, 2006).

4.2. Robustness Tests

To address the potential endogeneity issues, we follow Haque & Ntim (2022) by re-estimating the model using lagged SC (L.SC). We replace the independent variables with their lagged values to account for the possibility that firms may require approximately one year to observe the effects of policy implementation

SC remains consistent with the main findings, confirming the robustness of our results, as depicted in Table 7.

In addition, this study also adopts the 2SLS method to address endogeneity concerns. We employ instrumental variables (IVs) that are correlated with the explanatory variables but not with the error term. As suggested by Xie (2024), the first and second lags of SC are chosen as the instrumental variables in this study.

Table 7.
Robustness Tests: Sensitivity Tests with Lagged Values of Independent Variable

	(1)	(2)	(3)	(4)
VARIABLES	Env_Overall	Env_Product	Env_Innov	Resource_Red
L.SC	13.35*** (1.838)	21.22*** (3.075)	10.37*** (2.184)	15.92*** (2.281)
Bsize	-0.340 (0.443)	-1.023 (0.741)	-0.0497 (0.527)	-0.772 (0.550)
Bind	0.0669 (0.0479)	-0.149* (0.0802)	0.0434 (0.0570)	0.137** (0.0595)
Bdiv	0.177* (0.0937)	0.0729 (0.157)	0.350*** (0.111)	-0.201* (0.116)
Bmeet	-0.106 (0.0837)	0.252* (0.140)	-0.181* (0.0995)	-0.116 (0.104)
Fsize	10.63*** (0.911)	10.19*** (1.523)	12.16*** (1.082)	2.314** (1.130)
Roa	41.51 (36.96)	-6.174 (61.84)	19.55 (43.93)	43.34 (45.89)
Capin	189.5 (121.5)	21.50 (203.2)	235.8 (144.4)	10.15 (150.8)
Lev	1.279 (0.777)	0.150 (1.299)	1.476 (0.923)	-0.404 (0.964)
Gdp	-0.163 (0.261)	-0.353 (0.436)	-0.158 (0.310)	0.243 (0.324)
inf	-0.123 (0.102)	-0.157 (0.170)	-0.127 (0.121)	-0.314** (0.126)
Year Fixed Effect	YES	YES	YES	YES
Country Fixed Effect	YES	YES	YES	YES
Constant	-244.2*** (21.00)	-233.2*** (35.13)	-296.0*** (24.96)	-31.58 (26.07)
Observations	535	535	535	535
R-squared	0.627	0.425	0.575	0.372

Standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

(Yang et al., 2024; Yuan et al., 2022). Moreover, the L.SC variable is unlikely to be directly influenced by simultaneous shocks to environmental performance captured in the error term, making it plausibly exogenous to the regression disturbance. Our results suggest that the positive and significant coefficient of

These instruments are employed in the first regression to estimate the endogenous variable (SC). In the second stage, the predicted values replace the original variable in the regression model to obtain consistent estimates. As illustrated in Table 8, the Kleibergen-Paap rk LM statistic significantly rejects the null hypothesis, confirming that the model does not suffer from under-identification. The Cragg-Donald Wald F statistic exceeds the 10% critical threshold of the Stock-Yogo weak instrument test, indicating that weak instruments are not a concern. The results show that the coefficient of SC remains statistically significant and positive across all models, reinforcing the robustness of our findings.

Lastly, as outlined by previous research (Aydemir & Guloglu, 2017; Baum et al., 2007), a fixed-effect GMM regression is also performed. This technique differs from the two-step difference and system GMM methods of Arellano & Bond (1991) and Blundell & Bond (1998) in two key aspects. First, it accounts for autocorrelation and heteroskedasticity in the disturbances of the baseline model, resulting in more efficient estimates. Second, it avoids the use of dynamic instruments, thereby keeping the number of instruments constant over time. These features make the fixed-effect GMM approach particularly suitable for our model, given the use of static instruments in this study and the potential presence of autocorrelation and heteroskedasticity, as evidenced by the LM_{het} and F_{AC} results in Table 8.

Table 8.
Robustness Tests: OLS, 2SLS, and GMM Regressions

	OLS	GMM-FE	2SLS IV= L1.SC	2SLS IV= L2.SC
VARIABLES	Env_Overall	Env_Overall	Env_Overall	Env_Overall
CLGI2_SC	18.71*** (1.704)	3.912** (1.923)	18.07*** (4.943)	21.75** (10.85)
L.Env_Overall		0.735*** (0.0366)		
bsize	0.146 (0.382)	-0.245 (0.355)	-0.434 (0.437)	-0.593 (0.462)
bind	0.0106 (0.0385)	-0.00750 (0.0395)	0.0693 (0.0456)	0.0421 (0.0579)
bdiv	0.510*** (0.0679)	0.0422 (0.0646)	0.176* (0.0916)	0.197* (0.106)
bmeet	0.261*** (0.0659)	-0.0158 (0.0473)	-0.0930 (0.0786)	-0.0436 (0.0919)
fsize	7.903*** (0.729)	3.274*** (0.910)	10.14*** (1.013)	10.01*** (1.287)
roa	91.13*** (31.68)	25.22 (24.28)	51.25 (31.95)	105.2** (48.64)
capin	218.1** (97.12)	199.8* (102.1)	194.5 (135.1)	338.6** (140.5)
lev	2.441*** (0.639)	0.952 (0.687)	1.324 (0.890)	1.095 (0.954)

Table 8.
Robustness Tests: OLS, 2SLS, and GMM Regressions (Continued)

VARIABLES	OLS	GMM-FE	2SLS IV= L1.SC	2SLS IV= L2.SC
	Env_Overall	Env_Overall	Env_Overall	Env_Overall
gdp	0.160 (0.253)	-0.299 (0.188)	-0.149 (0.265)	-0.346 (0.293)
inflation	0.290*** (0.0888)	0.0509 (0.0849)	-0.135 (0.145)	-0.0460 (0.164)
Year Fixed Effect	YES	YES	YES	YES
Country Fixed Effect	YES	YES	YES	YES
Constant	-184.0*** (17.09)	-71.04*** (20.42)	-234.9*** (22.40)	-227.2*** (29.36)
Kleibergen-Paap rk LM		144.022***	196.813***	109.899***
Cragg-Donald Wald F		310.917***	919.254	287.568
Hansen		0.119		
F		140.54***		
LM _{het}		3.654*		
F _{AC}		162.816***		
Observations	670	412	535	423
R-squared	0.484	0.843	0.618	0.613

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

The estimation includes 71 groups and two instruments. The first and second lags of the exogenous variables serve as instruments for both the lagged dependent variable and other endogenous regressors. To verify the adequacy of these instruments, we conduct three diagnostic tests: the Kleibergen-Paap rk LM test (2006), the Cragg-Donald F statistic (1993), and the Hansen J statistic (1982). The first two evaluate the correlation between endogenous regressors and IVs, while the Hansen J statistic examines the relationship between IVs and the error term.

As shown in Table 8, both the Kleibergen-Paap rk LM test and the Cragg-Donald F statistic reveal weak correlations between the IVs and endogenous variables, while the Hansen J statistic fails to reject the null of valid overidentifying restrictions. This indicates that the IVs in our model are appropriate. Overall, the findings from both the 2SLS and GMM estimations show that SC coefficients remain significant and positively associated with *Env_Overall*. These results reinforce our main conclusions, demonstrating that our findings are robust to potential endogeneity concerns. Lastly, Table 9 presents the results of additional regressions controlling for bank fixed effects instead of country fixed effects, which remain consistent with the main findings.

Table 9.
Robustness Tests: Regression Results with Bank Fixed Effects

VARIABLES	(1) Env_Overall	(2) Env_Product	(3) Env_Innov	(4) Resource_Red
SC	8.003*** (2.387)	19.48*** (3.906)	7.635*** (2.922)	14.33*** (3.288)
bsize	-1.143** (0.471)	-1.808** (0.749)	-1.003* (0.557)	-1.026 (0.640)
bind	-0.0359 (0.0503)	-0.133 (0.0855)	-0.0484 (0.0592)	0.132* (0.0745)
bdiv	0.435*** (0.104)	0.271 (0.188)	0.617*** (0.126)	-0.281** (0.137)
bmeet	0.118 (0.145)	0.00218 (0.221)	-0.0129 (0.168)	-0.0221 (0.174)
fsize	8.764** (4.287)	20.85*** (7.141)	12.92** (5.215)	13.52** (5.758)
roa	48.21 (56.50)	86.38 (90.28)	50.68 (64.62)	120.5 (78.62)
capin	264.1 (198.7)	-192.0 (300.0)	209.4 (248.1)	369.8 (244.9)
lev	1.380* (0.719)	1.537 (1.403)	1.575* (0.882)	3.029*** (1.071)
gdp	-0.0169 (0.184)	0.328 (0.322)	-0.0273 (0.221)	-0.181 (0.203)
inflation	-0.0721 (0.0751)	-0.279*** (0.0979)	-0.0608 (0.0810)	-0.285** (0.141)
Year Fixed Effect	YES	YES	YES	YES
Bank Fixed Effect	YES	YES	YES	YES
Constant	-195.6* (103.1)	-478.3*** (172.3)	-323.5** (126.3)	-308.5** (139.2)
Observations	670	670	670	670
R-squared	0.824	0.738	0.797	0.720

Robust standard errors in parentheses. *** p<0.01, ** p<0.05, * p<0.1

V. CONCLUSION AND RECOMMENDATIONS

Using a panel of 85 banks across 12 countries between 2012 and 2024—which includes 21 IBs and 64 CBs—this study finds that SCs significantly enhance environmental performance in emerging market banks, with the most pronounced effects in CBs. Grounded in the stakeholder and legitimacy theories, the results show that SCs act as effective governance mechanisms, driving product innovation, environmental initiatives, and resource efficiency. For IBs, the weaker association—particularly in products and innovations—reflects a stronger emphasis on religious legitimacy over broader social legitimacy, highlighting the need to align *Maqasid al-Sharia* with environmental objectives. The results remain robust with lagged key independent variable, instrumental variable approaches, and fixed-effect GMM estimations to mitigate endogeneity concerns. By isolating the environmental dimension of

ESG and distinguishing between CBs and IBs, this study extends the governance literature and provides new empirical evidence from the emerging markets.

This study offers several theoretical implications. First, this study provides insight into the role of SCs in the environmental performance of both IBs and CBs, suggesting that SCs are a governance mechanism capable of enhancing EIs in the banking sector, thereby validating the stakeholder theory. Regarding the unanticipated finding of a weaker influence of SCs on EIs in IBs, this study suggests that in IBs, there might be dual legitimacy concerns, both religious legitimacy and social legitimacy. However, the findings challenge the assumption that multiple legitimacy is complementary; rather, they propose that legitimacy is more substitutive. The institutionalization of religious legitimacy by IBs through Shariah compliance independently satisfies stakeholder expectations, thereby reducing the additional legitimacy gained from a formal SSBs and mitigating environmental impacts, which could result in symbolic EIs. This suggests that the legitimacy theory should be broadened in its sources of interactions, particularly in companies with dual legitimacy concerns, including IBs, where religious legitimacy may be decoupled from environmental performance, indicating that SCs are insufficient to drive specific EI outcomes, such as environmental innovation and resource reduction.

From a policy perspective, this study offers several recommendations particularly for Bank Indonesia. First, Bank Indonesia could introduce formal regulatory guidelines mandating or strongly recommending the establishment of SCs at the board level, particularly for large and systemically important banks. Such guidelines should go beyond structural requirements and specify the roles, responsibilities, and competencies of SC members to increase their effectiveness. Second, Bank Indonesia may develop standardized green governance and disclosure frameworks, requiring banks to link sustainability reporting with measurable environmental outcomes (e.g., financed emissions, green lending ratios), thereby reducing the risk of mere symbolic compliance and greenwashing. Third, Bank Indonesia could implement monitoring and evaluation mechanisms, such as integrating sustainability-related metrics into supervisory assessments or stress testing frameworks, to ensure that SC activities are aligned with substantive environmental performance.

In addition, Bank Indonesia may promote capacity-building programs and industry-wide awareness initiatives, encouraging banks to embed sustainability into core business strategies rather than treating it as a peripheral obligation. Incentive-based policies such as preferential regulatory treatment, green financing quotas, or refinancing schemes for environmentally sustainable projects could further motivate banks to operationalize SC recommendations into tangible actions.

For IBs, the findings indicate that the impact of SCs is less pronounced compared to CBs, particularly in relation to EIs associated with products and innovation. This suggests that the management of IBs must place greater emphasis on enhancing the innovation of their financial products and financing mechanisms. Such innovations can be advanced through the development of green and environmentally sustainable financial instruments, alongside a more active role of SCs in aligning sustainability efforts with Shariah principles.

Moreover, the IBs' EIs can be incorporated into Sharia governance frameworks by integrating environmental considerations into the deliberations of SSBs when issuing Sharia rulings (*fatwas*). In practice, environmental aspects may be considered when assessing the permissibility and broader impact of financial products, investment activities, and financing decisions. By doing so, IBs can ensure that their operations are not only compliant with Sharia principles but also aligned with the broader objectives of *Maqasid Al-Sharia*, particularly the protection of life and the preservation of natural resources. This approach would allow environmental responsibility to be embedded in existing religious governance structures rather than treated as a separate sustainability mechanism.

While this study provides several important insights, it is subject to a number of limitations related to data availability, methodological constraints, and generalizability. First, data limitations arise from the limited availability of environmental performance information on Islamic banks. The dataset is limited to banks for which complete data were accessible, resulting in a relatively small sample size that is largely concentrated in developing economies. Future studies could expand the dataset by incorporating IBs from developed economies once more comprehensive data are available. Such an expansion would allow for additional evidence from countries with more mature financial markets and stricter regulatory environments.

Second, methodological limitations stem from the reliance on secondary data sources for the construction of key variables, including SC, Env_Overall, Env_Product, Env_Innov, and Resource_Red. Although these indicators provide useful proxies, they may not fully capture the actual implementation of environmental practices within organizations. Consequently, the extent to which these measures reflect real operational practices may be subject to measurement constraints. Future research could complement these quantitative indicators with qualitative research, such as case studies or structured interviews with managers, shareholders, and regulatory authorities, to obtain deeper contextual insights.

Finally, there are generalizability consideration. The study focuses exclusively on banking institutions within the formal financial sector, which may limit the extent to which the findings can be generalized to other industries. Future research could extend the analysis to a broader range of entities, including firms operating in different segments of the capital markets and other financial institutions, such as insurance and energy companies. Expanding the scope in this way would contribute to a more comprehensive understanding of the issues examined in this study.

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