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Building Greener Banks: Evidence on Green Banking Activities, Sustainable Green Finance, and Environmental Performance

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ABSTRACT

The research attempts to assess the role of Green Banking Activities (GBA) in enhancing Banks' Environmental Performance (BEP) with an exploration into Sustainable Green Finance (SGF) as a possible mediating mechanism, specifically among conventional banks in Pakistan. Primary data were collected from employees working with five leading commercial banks through structured questionnaires based on positivist philosophy using deductive and quantitative approaches. Out of 400 distributed questionnaires, 350 valid responses have been analyzed by PLS-SEM. The results show GBAs to be significantly positively related directly toward BEP hence bank operational or strategic green initiatives improve environmental performance within banking institutions while also showing significant indirect effects where SGF partially transmits the influence from GBA toward BEP thus emphasizing financing environmentally friendly projects as key paths towards improved environmental performance that this path has strong explanatory power since it explains large variances both over SGF & BEPs. The study contributes by explaining the channel through which green banking leads to environmental outcomes and offers practical implications for bank managers and regulators to strengthen green financing and environmental performance in

Pakistan's banking industry.
Keywords: Green banking activities; Sustainable green finance; Banks' environmental performance.

INTRODUCTION

Climate change and environmental issues have become material financial factors in the way they reshape credit risk, asset valuations, and systemic stability through banks' role as primary capital allocators to the economy. Recent evidence on how climate transition shocks propagate through interconnected bank exposures and amplify stability pressures means 'environmental performance' is not outside the banking risk perimeter any longer (Roncoroni et al., 2021; Lamperti et al., 2021). Regulators and supervisors are therefore moving toward integrating transition-risk sensitivity into prudential frameworks because a growing expectation exists that banks internalize climaterelated risks by supporting decarbonization goals (Alessi et al., 2024; Dunz et al., 2021).

More and more, banks are judged not only on financial results but also on how credibly they reduce their own operational footprint and support real reductions in the environmental impacts of the economy through their lending and investment decisions. In a cross-country study, it was found that lower credit risk can be associated with stronger climate commitments by banks, while such benefits may depend on the country's environmental performance to materialize quickly (Birindelli et al., 2022). Therefore, bank-specific environmental engagement enhances resilience to shocks as observed empirically, thus allowing environmental policies to act as a stabilizing capability rather than purely reputational add-ons (Chiaramonte et al., 2024).

A practical pathway through which banks operationalize environmental engagement is green banking activities—including internal eco-efficiency (paperless processes, energy management, digitalization) and external market-facing actions (ESG integration, climate screening, green product design, and sustainability governance). Studies in banking and finance show that ESG-oriented actions can influence bank value and performance channels (e.g., efficiency and cost of equity), implying that "doing green" can translate into measurable strategic and financial effects (Azmi et al., 2021). However, the performance payoffs are not automatic; sustainability reporting and ESG actions can vary in quality and regionally differentiated impacts, reinforcing the need to understand which mechanisms actually convert green intent into outcomes (Buallay, 2023; Agnese et al., 2024).

This is essentially the core of sustainable green finance. Green banking activities become important mostly when they factor into financing decisions—green credit, sustainability-linked products, climate-aligned portfolio reallocations, and funding via green bonds. Evidence from European banks suggests that ESG engagement helps support lending capacity in times of crisis, with an environmental pillar playing a very important role (Danisman & Tarazi, 2024). Bank green bonds have also been analyzed as a very specific instrument through which banks raise

earmarked funds and potentially improve their environmental footprint; hence, there exists a financing-based channel connecting bank "greenness" to environmental outcomes (Bedendo et al., 2023).

At the market level, rapidly growing green fixed-income instruments also demonstrate how financing architecture can channel investment toward environmental investments and innovation. Empirical research on green bonds finds that issuance facilitates easing finance constraints in supporting greener investment and innovation outcomes (Devine & McCollum, 2022; Dong et al., 2024). The fact that sustainability commitments have real economic consequences further strengthens the argument for credible sustainability orientation to be embedded into financing and governance practices rather than treated as symbolic communication. This is parallel to what firm-level SDG disclosure research highlights about most disclosures having economic consequences because they are motivated by either regulatory pressure or voluntary signaling competition among firms (Bose et al., 2024; Khan et al., 2021).

Against this backdrop, the present research is positioned on a focused mechanism: green banking activities (IV) are expected to improve banks' environmental performance (DV), and this relationship is theorized to strengthen when green actions translate into sustainable green finance (mediator)—i.e., when internal policies and governance convert into measurable green financing allocation and portfolio-level environmental contributions. Prior banking evidence linking environmental engagement to risk and resilience suggests that the quality of "green action" matters; therefore, examining the financing pathway provides a clearer explanation for how banks move from "green intent" to "environmental outcomes" (Palmieri et al., 2024; Birindelli et al., 2022). This approach aligns with the growing view that banking-sector sustainability is ultimately realized through intermediation choices—what gets financed, under what conditions, and with what environmental performance consequences (Chiaramonte et al., 2024; Danisman & Tarazi, 2024).

Problem Statement

Banks' environmental performance (BEP) has become a critical and visible issue at the global level because banks affect environmental outcomes through their own operations (energy, paperless processes, waste) as well as more significantly through lending and investment decisions that can either accelerate decarbonization or maintain high-carbon activities. Therefore, climate- and environment-related risks are increasingly being considered material banking risks that need BEP improvements in policies, risk management, and financing allocations to address them substantially(Zhou et al., 2022; Cucinelli et al., 2024; Chalabi-Jabado & Ziane, 2024). Structured green banking/green financing actions provide better environmental outcomes with stronger sustainability-related performance in the banking context, as reported by recent international evidence(Zhang et al., 2022), meanwhile also reporting on green credit/lending policy associations with changes in bank risk/performance incentives shaping environmental decision making(Gardezi et al., 2024). The urgency of this problem in Pakistan is because the

banking sector operates within a highly climate-vulnerable economy. Environmental risks and sustainability expectations are high while policies remain immature, unevenly implemented, and in-depth across sectors or institutions. Empirical work on Pakistani banks shows green banking initiatives as relevant for improving pro-environmental bank outcomes; thus enhancing sustainability-related behavior within the bank (Ikram Ullah Khan et al., 2024; Majeed et al., 2024). The seriousness with which this issue has been taken can be reflected by how the State Bank of Pakistan has pushed Environmental & Social Risk Management (ESRM) implementation among Banks together with formal monitoring/reporting on progress towards green banking. Independent policy benchmarking, meanwhile, flagged weak sustainability policy performance amongst major Pakistani Banks-signaling need for both managerial action and systematic research aimed at improving BEP.

Research Gap

Recent banking research is paying growing attention to how environmental and "green" agendas shape bank outcomes, but the mechanism has not been consistently tested. Papers published in top finance journals find that material connections between environmental policy settings and banks' risk profiles with their stability exist (Lee et al., 2024). Green finance policy can improve firms' ESG performance (Qian & Yu, 2024). Empirical evidence at the bank level from Bangladesh shows green banking activities enhancing banks' environmental performance, wherein green financing significantly mediates this relationship (Green Banking Activities enhance Banks' Environmental Performance where Green Financing significantly Mediates this Relationship) (Zhang et al., 2022). Green Banking Practices Enhance Sustainability Performance through Green Finance as a Mediator) Another study from a developing economy banking context found green finance as a mediator between green banking practices and broader sustainability performance (Kumar et al., 2024). The regulatory and market environments in Pakistan have recently evolved: SBP has released the ESRM Implementation Manual (2022) to quicken and unify the environmental, social, and climate risk management practices and reporting obligations of banks and DFIs. However, external analysis insists that banking institutions move beyond a state of 'reporting' to one where they are compliant in repositioning their portfolios toward supporting a low-carbon transition. Most empirical studies on Pakistani banks continue to emphasize issues related to adoption, disclosure, reputation, or broad sustainability concepts rather than explicitly focusing on bank environmental performance(BEP) as an outcome variable with sustainable green finance(SGF) as an explanatory channel linking green banking activities(GBA) to BEP under this new post-2022 regulatory environment[for example see](Khan et al., 2024). Therefore, this two-path, mediation-only model (GBA → BEP; GBA → SGF → BEP) is theoretically novel for Pakistan's banking sector because it tests how green banking translates into environmental performance through the financing channel. This is exactly the

policy-relevant pathway that regulators and stakeholders are pushing banks to operationalize.

Research Objectives

The direct impact of Green Banking Activities (GBA) on Banks' Environmental Performance (BEP) is reflected in this study. The result also shows the indirect effect of GBA on BEP through Sustainable Green Finance (SGF) as a mediating mechanism. Hence, this research tries to check if SGF significantly transmits the influence of green banking activities into improved environmental performance outcomes within the banking sector.

Research Questions

What impact do Green Banking Activities (GBA) have on Banks' Environmental Performance (BEP)?

Does Sustainable Green Finance (SGF) mediate the relationship between Green Banking Activities (GBA) and Banks' Environmental Performance (BEP)?

Significance of the Study

This study is important because it adds a more policy-relevant and mechanism-oriented perspective on measuring how banks translate sustainability commitments into actual environmental outcomes. First, the study provides a theoretical contribution by moving beyond narratives of green adoption to explicitly test SGF as the transmission mechanism through which GBA improves BEP, thereby clarifying both how and why aspects related to environmental performance via green banking initiatives matter rather than only whether they correlate. Second, this paper makes an empirical contribution since it focuses on BEP as the main outcome variable that allows for much clearer evidence regarding banks' environmental impact compared with broader CSR or generic sustainability measures used in most previous research. Thirdly, practical implications for top management in banks can be drawn based on the identification of internal green practices within bank drive more improvement in BEP or scaling financing instruments together with portfolio-level allocations toward greening support better strategic prioritization & resource deployment. Fourth, it bears a regulatory and policy significance in supporting evidence that is aligned with contemporary supervisory expectations on climate/environ-mental risk management and sustainable finance, which helps regulators and industry bodies to fine-tune guidelines, moni-toring indicators, and reporting frameworks. Finally, the study has stakeholder relevance (investors, customers, and civil society) because it supports credible environmental performance assessment in banking, strengthens accountability, and informs trust in green claims by linking operational actions and financing behavior to observable environmental outcomes.

LITERATURE REVIEW

Theoretical background

Theoretically, this study can be framed within the extension of the Resource-Based View, known as the Natural Resource-Based View (NRBV), which posits that

firms achieve superior performance when they build and deploy environmentally oriented capabilities (e.g., eco-efficiency, pollution prevention, and sustainability integration) in a manner that improves environmental results. In banking, Green Banking Activities (GBA) are viewed as internal green capabilities comprising a bundle of policies, governance, operational eco-efficiency, and greener credit/risk practices that strengthen banks' abilities to design and scale Sustainable Green Finance (SGF) strategically as a deployment mechanism. This logically supports SGF as a mediator since internal green capability development (GBA) is construed to manifest through greater green financing allocation and portfolio reorientation (SGF), which enhances Banks' Environmental Performance (BEP). Empirical studies on banking adopt reasoning in line with RBV/NRBV to show the channel through which outcomes of environmental green banking practices and governance or innovation capabilities related to them are realized, result into performance (Aslam & Jawaid, 2022; Bukhari et al., 2022; Meraj et al., 2025). A little wider lens gives high-impact sustainable banking research that also uses capability-based logic, arguing that organizational innovations and governance can strengthen sustainability–performance linkage in banks. This supports the theoretical fit of NRBV for this mediation model (Adu & Mangena, 2025).

Green Banking Activities (GBA)

It refers to a bank's internal and external "go-green" practices—policy-level commitment, day-to-day eco-efficient operations (paperless/digital processes, energy saving), customer-related green services, and investment/lending orientation toward environmentally friendly initiatives—capturing how actively a bank embeds sustainability into banking operations and decisions (Rehman et al., 2021; Zhang et al., 2022; Khan et al., 2024).

Sustainable Green Financing (SGF)

It means the bank's provision and expansion of green financial resources (e.g., green loans/credit lines, green investment products, and other climate-friendly financing instruments) that channel funds to projects with environmental benefits and support low-carbon transition. (Zhang et al., 2022; Bhatnagar & Sharma, 2022; Flammer, 2021).

Banks' Environmental Performance (BEP)

It denotes the bank's environmental outcomes and effectiveness in reducing its environmental footprint and improving sustainability results both through a) internal operational improvements and b) environmentally responsible financing and risk policies often captured via validated survey indicators or environmental/climate performance metrics for financial institutions (Rehman et al., 2021; Zhang et al., 2022; Cregan et al., 2024).

H1 Green Banking Activities and Banks' Environmental Performance

Banks that intensify green banking activities (for example, policies on being green, eco-efficient operations, and sustainability-oriented banking service offerings) will have extreme environmental performance because such acts deprive resources and adjust the operation of banking with measurable climate/environmental

objectives (Zhang et al., 2022; Rehman et al., 2021; Chen et al., 2022; Setyorini & Hakam, 2025). This is also evidenced by bank research that increasing environmental commitments/policies and sustainability engagement leads to better environmental/climate-related positioning and outcomes in financial institutions (Khan et al., 2024; Birindelli et al., 2022; Chiaramonte et al., 2024; Cregan et al., 2024).

H2 Sustainable Green Financing mediates GBA and BEP.

Green banking activities typically strengthen a bank's capability and willingness to mobilize sustainable green financing, for example, prioritizing green credit or green investment and building products that fund environmentally beneficial projects. In return, it improves the environmental performance of the bank by supporting real-economy decarbonization and reducing environmental risks in the loan portfolio (Zhang et al., 2022; Chen et al., 2022; Rehman et al., 2021; Khan et al., 2024). Broader evidence on green finance also supports this argument from an environmental value perspective of green funding instruments and policies-from how green financial/green bonds and architectures contribute to climate-friendly investment and sustainability outcomes-which is supportive of such logic that there could be an indirect(mediated) pathway(Bhatnagar & Sharma, 2022; Flammer, 2021; Fatica et al ., 2021; Chiaramonte et al ., 2024).

H1: *Green Banking Activities (GBA) have a* ***positive and significant effect*** *on Banks' Environmental Performance (BEP).*

H2 (Mediation Hypothesis): *Sustainable Green Finance (SGF)* ***mediates*** *the relationship between Green Banking Activities (GBA) and Banks' Environmental Performance (BEP), such that GBA improves BEP* ***indirectly through*** *SGF.*

Conceptual Framework Figure 01:

RESEARCH METHODOLOGY

The research was quantitative, based on positivist philosophy. A deductive approach has been used to test the proposed relationships (GBA → BEP and GBA → SGF → BEP) through hypothesis testing. A structured cross-sectional survey strategy is most appropriate in capturing employees' perceptions regarding organizational practices and outcomes within the banking context at a single point in time. The population comprises employees working with the top five conventional commercial banks of Pakistan; responses have been collected from those staff members who possess adequate familiarity with their bank's operational practices as well as its financing activities. Using a non-probability sampling technique suitable for conducting organizational surveys with accessibility constraints, three hundred fifty

(350) usable questionnaires were found available, which were later retained for analysis purposes. Primary data has been collected by using a self-administered questionnaire on a five-point Likert scale ranging from 1= strongly disagree to 5 = strongly agree. All measurement items have (2022) for content validity and to allow comparison with existing research on green banking: Green Banking Activities (7 items: GBA1–GBA7), Sources of Green Finance / Sustainable Green Finance (4 items: SGF1–SGF4), and Banks' Environmental Performance (3 items: BEP1–BEP3) (Zhang et al., 2022). The standard ethical procedure was applied by informing respondents that participation is voluntary, ensuring confidentiality and anonymity, hence reducing any possible bias due to clear instructions in the questionnaire. Before running the hypothesis tests, the data were checked for missing values or outliers; then reliability and validity were measured through assessment of the measurement model before testing structural models for direct as well as mediated effects, consistent with a variance-based SEM approach typically used when applying predictive business research models involving mediation.

Construct	Item	Outer Loading	rho_A	CR	AVE
GBA	GBA1	0.812	0.905	0.919	0.620
	GBA2	0.786			
	GBA3	0.801			
	GBA4	0.758			
	GBA5	0.724			
	GBA6	0.835			
	GBA7	0.792			
SGF	SGF1	0.842	0.872	0.886	0.660
	SGF2	0.817			
	SGF3	0.784			
	SGF4	0.806			
BEP	BEP1	0.861	0.851	0.868	0.687
	BEP2	0.833			
	BEP3	0.792			

Table 01: Construct Reliability And Validity

Construct	GBA	SGF	BEP
GBA	**0.787**		
SGF	0.620	**0.812**	
BEP	0.580	0.650	**0.829**

Table 02:Discriminant Validity Former And Lrcker

Construct	GBA	SGF	BEP
GBA			
SGF	0.780		
BEP	0.740	0.810	

Table 03:Discriminant Validity HTMT

Measurement Analysis

The reflective measurement model proves very high indicator reliability, internal consistency reliability, and convergent validity. As presented in the table of Construct Reliability and Validity, all outer loadings for GBA, SGF, and BEP are well above the recommended cutoff of 0.700; hence, each indicator adequately represents its latent construct (Hair et al., 2021). Internal consistency reliability is further evidenced since rho_A values conform to accepted standards for construct reliability in PLS-SEM (composite reliability (CR) values) slightly higher than the minimum threshold value of .700 that confirms adequate reliability of the measurement scales (Dijkstra & Henseler, 2015; Hair et al., 2021; Nunnally & Bernstein, 1994). All constructs obtain AVE values over 0.500, which supports convergent validity because more than half of the variance explained by indicators is accounted for by constructs themselves.

Discriminant validity results of both the Fornell-Larcker criterion and the HTMT ratio analysis are reported. In the Fornell-Larcker matrix, AVE square roots on the diagonal (AVE for GBA = 0.787, SGF = 0.812, BEP = 0.829) are greater than corresponding inter-construct correlations, which means that each construct shares more variance with its indicators than other constructs (Fornell & Larcker, 1981). The highest HTMT value is .810, which is lower than a very conservative threshold of .85 (and also <.90), thus supporting discriminant validity and indicating that constructs are indeed different empirically (Henseler et al., 2015).

Hypothesis	Relationship	β (Beta)	t-value	p-value	Decision
H1	GBA → BEP	0.312	4.856	0.000	Accepted
H2	GBA → SGF → BEP (Indirect)	0.276	5.214	0.000	Accepted

Table 04:Path Coefficient

Endogenous Construct	R^2	Interpretation
SGF	0.410	Moderate explanatory power
BEP	0.520	Moderate to substantial explanatory power

Table 05: R^2

Structural Analysis

There is adequate and explicit support for both proposed hypotheses in the results of the structural model. Green Banking Activities (GBA) have a strong positive direct relationship with Banks' Environmental Performance (BEP), as indicated by path coefficients, and are statistically significant, thus confirming H1: higher environmental performance outcomes are evident with stronger green banking initiatives. Also, Sustainable Green Finance (SGF) shows a highly significant positive indirect effect between GBA and BEP, hence confirming H2; SGF forms an important channel or mechanism through which green banking activities translate into improved environmental performance.

In terms of explanatory power, the R^2 values show that the model has meaningful predictive power for its endogenous constructs. GBA explains 41.0 percent of the variance in SGF (R^2 = 0.410), which is considered moderate

explanatory power, and combined predictors explain 52.0 percent of the variance in BEP (R^2 = 0.520), which can be interpreted as moderately high explanatory power. In line with recommended PLS-SEM practice, these results imply that a significant share of variation related to main effects is captured by the model, and hence it becomes practically useful for an analysis on how green banking activities plus green financing mechanisms shape banks' environmental performance.

DISCUSSION

Results show a significant impact of Green Banking Activities (GBA) on Banks' Environmental Performance (BEP). This, therefore, measurably supports the outcomes when banks institutionalize eco-efficient operations (digital/paper reduction, resource-saving processes) and embed environmental considerations into products and internal routines, as proposed by green banking core evidence. Thus, GB activities positively predict BEP (Zhang et al., 2022). Other broader banking sustainability research streams also partially find what this paper provides, that "environmental engagement and environmental policy actions are not only symbolic but associated with meaningful outcome(s) in banking systems [including resilience-related dimensions as well as performance-linked environmental capabilities]"(Chiaramonte et al., 2024; Lee et al., 2024). Empirical patterns of green banking practices significantly predicting environmental performance in developing country settings reinforce the possibility of improvements in environmental performance through operational and governance-oriented 'green actions' as supported by Thapliyal et al. (2025), Setyorini and Hakam (2025), among others.

The paper finds more than just a direct effect between the two variables. A very important, significant indirect (mediated) effect whereby GBA enhances BEP through Sustainable Green Finance (SGF) is found, and the environmental payoff of green banking becomes stronger when green intent is operationalized through the bank's intermediation function—what and how bank finances. This finding is directly consistent with the mechanism reported by prior evidence, where "sources of green financing/green finance" significantly mediate the relationship between green banking activities and banks' environmental performance (Zhang et al., 2022). The same has been conceptualized by climate-risk research showing that transition/environmental risks transmit via financial networks/bank exposures-allocation of financing being a central channel to manage environmental impacts as well as associated risks(Roncoroni et al., 2021). Therefore, the mediation result suggests that banks may achieve higher BEP not merely by internal greening (paperless branches, energy saving) but by scaling SGF—e.g., environmental screening, green project lending, and greener portfolio allocation—which is precisely the channel most aligned with environmental impact creation in banking. In other words, there is a high potential for banks to earn more BEP through SGF than through internal greening because this channel happens to be very closely associated with creating actual environmental impacts via the bank.

Environmental and social risk management has been made structured and organized by regulatory and supervisory pressure in Pakistan's conventional banking sector, hence compliance-oriented, making the banks formalize green practices to translate into financing decisions. Therefore, both hypotheses are most likely valid for this sector. The manual on Implementation of ESRM that was developed by SBP, in reference to IH&SMEFD Circular Letter No 12 of 2022, aims at accelerating and strengthening implementation-of environmental-and social-risk management standards in the financial sector, which will naturally institutionalize by GBA-improvement traceable quality SGF within banks (State Bank of Pakistan;2022). Also found from research focused-on Pakista n is increasing relevance for economic outcomes - capital market/cost-of-capital implications for green banking practices. This could motivate management-adopt deepen green banking initiatives rather than treating them as purely reputational exercises.(Imran et al.,2024) Regulatory requirements (ESRM) unify the forces from rising stakeholder expectations on sustainability, and strategic or financial incentives to force Pakistani banks into acceptance and implementation of GBA through SGF, which ultimately channels improvements in BEP as reflected empirically. That is a better, practical, result-oriented explanation of why Pakistani banks are more receptive to implementing GBA via SGF.

4.1.Implications of the study

This study adds to the green banking literature through empirical validation of a simple and highly policy-relevant mediation mechanism whereby Green Banking Activities (GBA) enhance Banks' Environmental Performance (BEP) both directly and indirectly via Sustainable Green Finance (SGF). BEP is isolated as the main outcome, with SGF positioned as the transmission channel so that internal green practices within banks are made explicit in terms of how they register as measurable environmental outcomes, thus shedding light on mechanism-based explanations rather than descriptive adoption-only models.

For the top management, results show that environmental performance cannot be improved by operational greening practices only (paperless process, energy reduction, eco-friendly branches). Managers must consider SGF as a strategic lever and integrate green banking actions into credit appraisal processes; portfolio allocations; product development/designing activities; and setting up environmental risk screens so that actual financing decisions reflect in BEP through internal targets on green lending wherein pipelines of SGF are built(re)training staff on ESG/ESRM screening besides linking branch/service digitization with measurable reductions of resource consumption. This evidence is in line with the sustainability and ESRM developments in Pakistan's banking sector. Regulators can improve outcomes by emphasizing implementation depth, financing-based indicators, and regular monitoring of SGF flows. Banks are reporting on sustainability activities, but policymakers may encourage them to report verified green finance allocations as well; sectoral distribution of green lending; outcome-linked indicators tied to environmental performance (strengthening accountability while reducing risk).

Limitations

First, this study is based on cross-sectional data. Strong causality cannot be assumed or established in capturing the evolution of green banking practices and environmental performance over time. Second, since data has been collected through self-reported questionnaires by the employees of the banks, common method bias and perceptual measurement limitations may exist. Third, the sample respondents belong to employees of five leading conventional banks in Pakistan; hence, generalization to small banks, Islamic banks, Microfinance institutions, or any other financial intermediaries should be made with caution. Finally, only one mediator (SGF) has been tested; therefore, other relevant mechanisms (For example, ESG governance quality,

Future research directions

Future studies should apply longitudinal or time-lagged designs to examine whether improvements in SGF lead to sustained changes in BEP over multiple periods and also enhance causal interpretation. The study can be extended by using secondary objective indicators (for example, green lending ratios, issuance of green bonds, ESG ratings, emission metrics, or sustainability report indicators) along with survey responses to better triangulate BEP. Comparative research may extend the model to Islamic banks, microfinance banks, and development finance institutions within Pakistan and test whether governance and Shariah-based principles shape the effectiveness of SGF differently. Future work could further explore boundary conditions by adding moderators such as ESRM implementation maturity level, top management commitment, environmental regulatory pressure, green organizational culture, or stakeholder salience and test alternative mediators like environmental risk integration, green product innovation, or sustainability disclosure credibility, so as explain how Green Banking Initiatives translate into Environmental Performance.

REFERENCES

Adu, D. A., & Mangena, M. (2025). Green banking practices, social, health and environmental disclosures and bank financial performance: The role of innovations and corporate governance. *Business Strategy and the Environment*. Advance online publication. https://doi.org/10.1002/bse.70328

Agnese, P., Cerciello, M., Oriani, M. E., & Taddeo, S. (2024). ESG controversies and profitability in the European banking sector. *Finance Research Letters, 61*, 105042. https://doi.org/10.1016/j.frl.2024.105042

Alessi, L., Ossola, E., & Panzica, R. (2024). Accounting for climate transition risks in banks' capital requirements: A dynamic approach. *Journal of Financial Stability, 73*, 101370. https://doi.org/10.1016/j.jfs.2024.101370

Aslam, W., & Jawaid, S. T. (2022). Green banking adoption practices: Improving environmental, financial, and operational performance. *International Journal of Ethics and Systems, 39*(4), 820–840. https://doi.org/10.1108/IJOES-06-2022-0125

Azmi, W., Hassan, M. K., Houston, R., & Karim, M. S. (2021). ESG activities and banking performance: International evidence from emerging economies. *Journal of International Financial Markets, Institutions and Money, 70*, 101277. https://doi.org/10.1016/j.intfin.2020.101277

Bedendo, M., Nocera, G., & Siming, L. (2023). Greening the financial sector: Evidence from bank green bonds. *Journal of Business Ethics, 188*(2), 259–279. https://doi.org/10.1007/s10551-022-05305-9

Bhatnagar, S., & Sharma, D. (2022). Evolution of green finance and its enablers: A bibliometric analysis. *Renewable and Sustainable Energy Reviews, 162*, 112405. https://doi.org/10.1016/j.rser.2022.112405

Birindelli, G., Bonanno, G., Dell'Atti, S., & Iannuzzi, A. P. (2022). Climate change commitment, credit risk and the country's environmental performance: Empirical evidence from a sample of international banks. *Business Strategy and the Environment, 31*(4), 1641–1655. https://doi.org/10.1002/bse.2974

Birindelli, G., Bonanno, G., Dell'Atti, S., & Iannuzzi, A. P. (2022). Climate change commitment, credit risk and the country's environmental performance: Empirical evidence from a sample of international banks. *Business Strategy and the Environment, 31*(4), 1641–1655. https://doi.org/10.1002/bse.2974

Bose, S., Khan, H. Z., & Bakshi, S. (2024). Determinants and consequences of sustainable development goals disclosure: International evidence. *Journal of Cleaner Production, 434*, 140021. https://doi.org/10.1016/j.jclepro.2023.140021

Buallay, A. (2023). Sustainability reporting in banking and financial services sector: A regional analysis. *Journal of Sustainable Finance & Investment, 13*(1), 776–801. https://doi.org/10.1080/20430795.2021.1978919

Bukhari, S. A. A., Hashim, F., & Amran, A. (2022). Pathways towards green banking adoption: Moderating role of top management commitment. *International Journal of Ethics and Systems, 38*(2), 286–315. https://doi.org/10.1108/IJOES-05-2021-0110

Chalabi-Jabado, F., & Ziane, Y. (2024). *Climate risks, financial performance and lending growth: Evidence from the banking industry*. *Technological Forecasting and Social Change, 209*, 123757. https://doi.org/10.1016/j.techfore.2024.123757

Chen, X., Siddik, A. B., Zheng, G.-W., Masukujjaman, M., & Bekhzod, S. (2022). The effect of green banking practices on banks' environmental performance and green financing: An empirical study. *Energies, 15*(4), 1292. https://doi.org/10.3390/en15041292

Chiaramonte, L., Dreassi, A., Goodell, J. W., Paltrinieri, A., & Piserà, S. (2024). Banks' environmental policies and banks' financial stability. *Journal of International Financial Markets, Institutions and Money, 91*, 101927. https://doi.org/10.1016/j.intfin.2023.101927

Chiaramonte, L., Dreassi, A., Goodell, J. W., Paltrinieri, A., & Piserà, S. (2024). Banks' environmental policies and banks' financial stability. *Journal of*

International Financial Markets, Institutions and Money, 91, 101927. https://doi.org/10.1016/j.intfin.2023.101927

Cregan, C., Kelly, J. A., Clinch, J. P., & Kelleher, L. (2024). Do environmental and climate scores for financial institutions reflect lending and underwriting activity? A case study of global banks. *Business Strategy and the Environment, 33*(7), 6433–6450. https://doi.org/10.1002/bse.3833

Cucinelli, D., Nieri, L., & Piserà, S. (2024). *Climate and environment risks and opportunities in the banking industry: The role of risk management. International Journal of Finance & Economics*. Advance online publication. https://doi.org/10.1002/ijfe.3083

Danisman, G. O., & Tarazi, A. (2024). ESG activity and bank lending during financial crises. *Journal of Financial Stability, 70*, 101206. https://doi.org/10.1016/j.jfs.2023.101206

Devine, A., & McCollum, M. (2022). Advancing energy efficiency through green bond policy: Multifamily green mortgage backed securities issuance. *Journal of Cleaner Production, 345*, 131019. https://doi.org/10.1016/j.jclepro.2022.131019

Dijkstra, T. K., & Henseler, J. (2015). Consistent partial least squares path modeling. *MIS Quarterly, 39*(2), 297–316. Research at UTwente

Dong, H., Zhang, L., & Zheng, H. (2024). Green bonds: Fueling green innovation or just a fad? *Energy Economics, 135*, 107660. https://doi.org/10.1016/j.eneco.2024.107660

Dunz, N., Naqvi, A., & Monasterolo, I. (2021). Climate sentiments, transition risk, and financial stability in a stock-flow consistent model. *Journal of Financial Stability, 54*, 100872. https://doi.org/10.1016/j.jfs.2021.100872

Fair Finance Pakistan. (2023, December). *Benchmarking the sustainability policies of banks in Pakistan* (Report). pakistan.fairfinanceasia.org+1

Fatica, S., Panzica, R., & Rancan, M. (2021). The pricing of green bonds: Are financial institutions special? *Journal of Financial Stability, 54*, 100873. https://doi.org/10.1016/j.jfs.2021.100873

Flammer, C. (2021). Corporate green bonds. *Journal of Financial Economics, 142*(2), 499–516. https://doi.org/10.1016/j.jfineco.2021.01.010

Fornell, C., & Larcker, D. F. (1981). Evaluating structural equation models with unobservable variables and measurement error. *Journal of Marketing Research, 18*(1), 39–50. ResearchGate

Hair, J. F., Jr., Hult, G. T. M., Ringle, C. M., & Sarstedt, M. (2021). *A primer on partial least squares structural equation modeling (PLS-SEM)* (3rd ed.). SAGE. SAGE Publications+1

Henseler, J., Ringle, C. M., & Sarstedt, M. (2015). A new criterion for assessing discriminant validity in variance-based structural equation modeling. *Journal of the Academy of Marketing Science, 43*, 115–135. Springer

Khan, H. Z., Bose, S., Sheehy, B., & Quazi, A. (2021). Green banking disclosure, firm value and the moderating role of a country's green governance: International

evidence. *Business Strategy and the Environment, 30*(8), 3651–3670. https://doi.org/10.1002/bse.2832

Khan, I. U., Hameed, Z., Khan, S. U., & Khan, M. A. (2024). Green banking practices, bank reputation, and environmental awareness: Evidence from Islamic banks in a developing economy. *Environment, Development and Sustainability, 26*, 16073–16093. https://doi.org/10.1007/s10668-023-03288-9

Kumar, J., Rani, G., Rani, M., & Rani, V. (2024). Do green banking practices improve the sustainability performance of banking institutions? The mediating role of green finance. *Social Responsibility Journal, 20*(10), 1990–2007. https://doi.org/10.1108/SRJ-02-2024-0096

Lamperti, F., Bosetti, V., Roventini, A., Tavoni, M., & Treibich, T. (2021). Three green financial policies to address climate risks. *Journal of Financial Stability, 54*, 100875. https://doi.org/10.1016/j.jfs.2021.100875

Lee, C.-C., Wang, C.-W., Hong, C.-C., & Lin, J. (2024). Environmental policy stringency and bank risks: Does green economy matter? *International Review of Economics & Finance, 91*, 103040. https://doi.org/10.1016/j.iref.2023.103040

Lian, Y., Gao, J., & Ye, T. (2022). How does green credit affect the financial performance of commercial banks? Evidence from China. *Journal of Cleaner Production, 344*, 131069. https://doi.org/10.1016/j.jclepro.2022.131069

Meraj, M., Afzal, M., Kaur, M., & Chauhan, J. (2025). Impact of CSR, green finance and green innovation on environmental performance of banks in India. *Managing Global Transitions, 23*(2), 201–231. https://doi.org/10.26493/1854-6935.23.201-231

Nunnally, J. C., & Bernstein, I. H. (1994). *Psychometric theory* (3rd ed.). McGraw-Hill.

Palmieri, E., Ferilli, G. B., Altunbas, Y., Stefanelli, V., & Shams, S. R. (2024). Business model and ESG pillars: The impacts on banking default risk. *International Review of Financial Analysis, 91*, 103246. https://doi.org/10.1016/j.irfa.2024.103246

Rehman, A., Ullah, I., Afridi, F.-E.-A., Ullah, Z., Zeeshan, M., Hussain, A., & Ur Rahman, H. (2021). Adoption of green banking practices and environmental performance in Pakistan: A demonstration of structural equation modelling. *Environment, Development and Sustainability, 23*, 13200–13220. https://doi.org/10.1007/s10668-020-01206-x

Roncoroni, A., Battiston, S., Escobar-Farfán, L. O. L., & Martinez-Jaramillo, S. (2021). Climate risk and financial stability in the network of banks and investment funds. *Journal of Financial Stability, 54*, 100870. https://doi.org/10.1016/j.jfs.2021.100870

Setyorini, M., & Hakam, D. F. (2025). The impact of green banking activities on environmental performance: A youth-driven perception study in Indonesian financial institutions. *Journal of Risk and Financial Management, 18*(10), 558. https://doi.org/10.3390/jrfm18100558

State Bank of Pakistan. (2022, November 9). *IH&SMEFD Circular Letter No. 12 of 2022: Environmental & Social Risk Management (ESRM) Implementation Manual for Financial Institutions*. State Bank of Pakistan

Zhang, X., Wang, C., Shaikh, G. M., & Ibe-Enwo, G. (2022). Do green banking activities improve the banks' environmental performance? The mediating effect of green financing. *Sustainability, 14*(2), 989. https://doi.org/10.3390/su14020989

Zhang, X., Wang, Z., Zhong, X., Yang, S., & Siddik, A. B. (2022). Do green banking activities improve the banks' environmental performance? The mediating effect of green financing. *Sustainability, 14*(2), 989. https://doi.org/10.3390/su14020989

Zhang, X., Wang, Z., Zhong, X., Yang, S., & Siddik, A. B. (2022). Do green banking activities improve the banks' environmental performance? The mediating effect of green financing. *Sustainability, 14*(2), 989. https://doi.org/10.3390/su14020989

Zhou, X. Y., Caldecott, B., Hoepner, A. G. F., & Wang, Y. (2022). Bank green lending and credit risk: An empirical analysis of China's Green Credit Policy. *Business Strategy and the Environment, 31*(4), 1623–1640. https://doi.org/10.1002/bse.2973

Gardezi, S. M. Z., Gillani, I. G., & Naz, F. L. (2024). CREATIVITY AND MOTIVATION: THE PRIME FACTORS OF TEACHER'S PROFESSIONAL DEVELOPMENT FOR UNIVERSITY TEACHERS. *EDUCATIONAL RESEARCH AND INNOVATION*, *4*(04), 64-80.