ORIGINAL ARTICLE

OPEN ACCESS

Beyond CSR: An Empirical Analysis of How Pakistan's Banks Drive Sustainability Through Operational Efficiency, Eco-Friendly Practices & Green Financial Products.

Muhammad Talha [1], Omer Mehmood [2], Muhammad Khalid Sohail [3]

Author's Affiliation:

[1]Visiting Lecturer, Department of Business Administration, Rawalpindi Women University, Pakistan
[2]Assistant Professor, School of Business, Pak-Austria Fachhochschule: Institute of Applied Sciences & Technology, Haripur, Pakistan.
[3]Professor, Bahria Business School, Faculty of Management Sciences, Bahria University, Islamabad Campus.

Article History:

Submitted: July 26, 2024
Revised: September 19, 2024
Accepted: September 27, 2024
Published online: September 30, 2024

Corresponding author(s):

Omer Mehmood
Email: Omer.mehmood@paf-iast.edu.pk

Co-author(s)Email:

Muhammad Talha
e.talha364@gmail.com

Muhammad Khalid Sohail
ksohail.buic@bahria.edu.pk

A B S T R A C T

Purpose —This study investigates the impact of green banking practices on environmental performance in Pakistan's banking sector. As concerns about banks' environmental footprint grow, green banking has emerged as a crucial sustainability strategy.

Study Design/methodology/approach — This study incorporates a cross-sectional sample of 150 employees from Islamic and conventional banks in Pakistan. Primary data was collected and analyzed using structural equation modeling (SEM) with Smart PLS software to examine the relationship between green banking practices and environmental performance.

Findings — Findings indicate significant benefits of green banking practices, including enhanced competitiveness, reduced long-term costs, improved customer goodwill, and reduced carbon footprint. By promoting sustainable economic development, green banking practices positively influence environmental performance.

Research Practical Implications — The study provides valuable theoretical and managerial implications for encouraging environmentally conscious banking practices. It also emphasizes the need for policy development and strategic adoption of environmentally responsible practices in order to promote sustainable finance and environmental stewardship in Pakistan's banking sector. However, based on a cross-sectional sample, the findings may not capture long-term effects or industry-wide trends.

Originality/value — Despite its importance, empirical research on green banking in Pakistan is scarce. This study addresses this gap by examining the relationship between green banking practices and environmental performance, offering fresh insights into an underexplored area in the context of developing countries.

Keywords: Green banking, environmental performance, sustainable finance, climate change and banking, eco-friendly finance

JEL Classification Codes: G21, Q01, Q56, M14

1 | INTRODUCTION

Human activities prioritizing economic growth over environmental sustainability have led to climate change, resulting in flooding, heat waves, and natural disasters (Zheng et al., 2021). Despite nature's bounty,

human actions harm the environment through deforestation, pollution, and unsustainable practices, causing storms, floods, droughts, earthquakes, and heat-related phenomena (Zhixia et al., 2018). Climate change affects both industrialized and developing nations alike. However, the pursuit of economic growth has overshadowed ecological sustainability, leading to long-term environmental consequences (Ngwenya & Simatele, 2020). Economic growth without environmental consideration is unsustainable. In response, the financial sector has developed "Green Finance," investments providing environmental benefits while promoting ecological sustainability (G20 Green Finance Synthesis Report, 2016). Green finance encompasses green banking, involving environmentally responsible investments and avoidance of climate-related harm (Lindenberg & Volz, 2016). Banks offer green financial products, low-interest loans for eco-friendly initiatives, and promote sustainable practices. Pakistan faces environmental challenges due to population growth, inadequate waste management, and industrialization (Bukhari et al., 2020).

The State Bank of Pakistan established guidelines for green banking, encouraging banks to fund environmentally friendly businesses and reduce carbon footprints (SBP, 2015). Green banking provides a competitive advantage and minimizes environmental threats. Banks play a crucial role in environmental management, financing industries and projects (Masukujjaman & Aktar, 2013). Banks allocate over PKR 10 billion annually to energy and infrastructure projects in Pakistan (SBP, 2024), and directing a small portion of that funding toward renewables could greatly cut national CO_2 emissions. Green banking practices, such as technological innovations and behavioral changes, reduce carbon footprints. Banks can ensure funded projects meet environmental norms, contributing to conservation. The concept of green banking extends beyond corporate social responsibility, making society livable without significant harm (Shaumya & Arulrajah, 2017).

The Indian Banks Association (2014) defines green banking as traditional banking with consideration of social and environmental aspects. Pakistan's banking industry has begun focusing on green banking, promoting environmentally responsible business operations (Bukhari et al., 2020). Adopting environmentally friendly tactics can provide a competitive advantage (Salvadó et al., 2013). Green banking promotes sustainable development, mitigates climate change, and protects the environment for future generations. Effective integration of sustainable and responsible business practices into banks' business models, strategies, and product and service development is essential. Banks can offer novel green products or low-interest green loans. For instance, banks may offer lower interest rates or concessional rates for consumers purchasing electric vehicles. By incorporating environmentally friendly considerations into lending operations, banks can maximize returns on investments while making polluting businesses more environmentally friendly.

Despite growing interest in green banking, empirical research remains scarce. Previous studies primarily examined green banking practices in broader South Asian contexts such as India, Bangladesh, and Sri Lanka, with limited focus on Pakistan's unique regulatory and operational environment. However, exploration of various aspects of green banking in Pakistan remained desirable. Green banking in Pakistan faces many hurdles, like limited borrower awareness, higher perceived loan risks in nascent clean-tech sectors, and a regulatory framework still catching up to global best practices (Niazi et al., 2023). In addition, limited borrower awareness and high technology costs remain key obstacles to scaling sustainable finance in Pakistan (Gupta, 2015). Within Pakistan, most available research lacks a primary data focus and fails to explore internal

operational dynamics, such as employee engagement, training, and implementation of eco-friendly policies. Lack of primary data, especially related to employee practices, customer policies, and the impact of green finance on environmental performance, remains a limiting factor for exploration in this domain. Research on employee engagement, operational efficiency, customer involvement, and policy implementation related to green banking practices, environmental performance, and their influence on sources of green finance remains scarce. Overcoming these challenges is essential to realizing the environmental benefits of green banking.

This study addresses these gaps by investigating the influence of green banking practices on environmental performance in Pakistan's banking sector, focusing on employee-related green banking policies, daily green banking operations, customer-oriented green banking policies, and policy-related eco-friendly banking practices using primary data from Pakistani banks. This study operationalizes environmental performance along three primary dimensions: (a) energy efficiency in branch and data-center operations, (b) carbon-footprint reduction, and (c) sustainability practices, whereas green banking practices refer to (a) green financial products, (b) energy-saving initiatives, and (c) eco-friendly policies.

The current study aims to provide valuable insights for policymakers, banking professionals, and future research by proposing the following research questions: To what extent do employee-related green banking policies and staff training impact banks' environmental performance? Does the implementation of energy-efficient techniques in banks' daily operations significantly enhance environmental performance? How do customer-related green banking practices influence banks' environmental performance? What is the effect of policy-related green banking practices on banks' environmental performance?

1.1 | Objective of Study

The primary objective of this study is to investigate the impact of green banking practices on banks' environmental performance and green finance sources in Pakistan. To achieve this objective, this study examines a multitude of objectives, including (1) identifying areas where Pakistani banks engage in green banking practices. (2) Assess the influence of employee-related green banking policies and staff training on banks' environmental performance. (3) Evaluate the effectiveness of energy-efficient techniques in banks' daily operations in enhancing environmental performance. (4) Examine the impact of environmental training, energy-efficient procedures, employee-related green banking practices, and policy-related activities on banks' environmental performance. (5) Investigate the effect of policy-related green banking practices on banks' environmental performance.

This research examines the green banking practices implemented by conventional and Islamic banks in Rawalpindi and Islamabad, and the perception of bank personnel on these practices and their impact on environmental sustainability. Islamabad and Rawalpindi encapsulate Pakistan’s economic diversity. Being the capital city of Pakistan, Islamabad houses the head offices of the majority of banks as well as policy makers and legislators, while Rawalpindi represents a fast-growing commercial hub. Insights from these twin cities can serve as a blueprint for both macro- and micro-level green banking strategies nationwide. In developing countries like Pakistan, adopting green banking techniques is vital for resource conservation, environmental sustainability, and global competitiveness. Understanding Pakistani banks' green banking practices is crucial for competing in global markets and fulfilling environmental and social responsibilities.

This study focused on analyzing green banking practices in the context of Rawalpindi and Islamabad, offering insights into the current state of green banking practices and their impact on environmental performance. However, the findings are specific to the local context, and future research may expand the scope to cover a broader range of banks across Pakistan. This will help in understanding the more comprehensive dynamics of green banking across different regions and sectors.

The remainder of the paper is organized as follows: Section 2 provides literature, followed by Section 3 outlining Research Methodology and Design. Section 4 provides results and discussion. Finally, Section 5 concludes with a summary of key insights and policy implications.

2 | LITERATURE REVIEW

2.1 | Definitions & Evolution of Green Banking

Green banking refers to the environmental responsibility and performance of banks in their business operations (Bahl, 2012; Bai, 2011). However, green banking rapidly evolved over the past decade from a limited CSR add-on to an integrated business strategy. Ginovsky (2009) and Chaurasia (2014) characterized green banking with the adoption of paperless banking, energy-efficient practices, and the use of renewable energy sources. Early definition (SBP, 2015), which emphasizes eco-friendly loans and paperless operations, has been broadened with recent studies expanding the scope of green banking with the inclusion of digital carbon-tracking tools and renewable-energy financing (Zhang et al., 2022). Zhang et al. (2022) define green banking as "the integration of environmental conservation objectives into every aspect of banking operation, from product design to risk management". Bashir et al. (2023)show how banks in South Asia now bundle green mortgages with rooftop-solar financing, illustrating the concept's growing sophistication. Environmentally friendly banking aims to prevent environmental deterioration and promote sustainability (Azman, 2012). Financial services through environmental protection and social responsibility can ensure their business activities are focused on both social and economic progress with environmental concerns and aligning their daily operations with environmental responsibility (Shaumya & Arulrajah, 2017).

2.2 | Drivers, Benefits, and Challenges of Green Banking

Banks emerged as a key facilitator in transitioning towards environmentally conscious, sustainable development. Their traditional view of financial intermediaries has evolved into enablers of ecological responsibility through the adoption of green banking practices (Goel & Saunoris, 2016). The primary drivers of this shift are mainly regulatory pressure and market-based incentives, pushing financial institutions to align their operations with environmental sustainability goals.

This shift in green practices adoption yields both reputational and operational benefits for banks. These practices, on one hand, help banks enhance credibility and build trust with increasingly eco-conscious stakeholders. Evident by recent studies, such as Sohail et al. (2023), highlights how that Pakistani bank offering green credit cards and eco-loans is transforming customer perceptions and investor confidence. From the operational side, banks can benefit from cost optimization. Digitalization reduces paper-based transactions, and energy-efficient data centers and appliances contribute to long-term cost reductions. Rehman et al. (2021) demonstrated that policy-related, operational, and investment-driven green banking initiatives significantly enhance environmental performance. Furthermore, Imran et al. (2025) showed that green banking practices

can lower the bank's cost of capital, indicating financial benefits that extend beyond operational savings to broader capital efficiency in emerging markets.

Banks can adopt various strategies to become more environmentally friendly. According to Masukujjaman and Aktar (2013), several processes and distribution channels can facilitate green banking. Going online is one approach, achieving energy and resource conservation through electronic banking, reducing paper use, energy consumption, and project costs (Risal & Joshi, 2018). Online banking enables customers to monitor account balances, make bill payments, cash transfers, and remote deposits, eliminating paper usage. Internet banking allows customers to execute financial transactions on institutional websites (Khedekar, 2014).Eco-friendly checking accounts provide online account statements accessible via ATM or touch screen devices, promoting environmental sustainability and mitigating global warming impacts (Ragupathi & Sujatha, 2015). Green loans offer low-interest financing for eco-friendly household products, such as solar equipment purchases (Ch, 2014). Green credit cards contribute to environmental protection by donating to non-profit organizations and promoting paperless banking (Jha & Bhome, 2013). Mobile banking reduces paper usage and travel to branch offices (Gupta, 2015). Automated Teller Machines (ATMs) enable electronic transactions, reducing paperwork. Utilizing solar and wind energy is an effective strategy for green banking (Gupta, 2015). Banks can adopt environmentally friendly practices by reducing pollution through recycling and paperless banking, utilizing energy-saving resources, sponsoring community activities, and employing financing and investing strategies to promote environmentally responsible initiatives and produce green goods.

Green Banking also encourages reliant businesses to adopt environmentally friendly practices (Bhardwaj & Malhotra, 2013). Green banking can lead to environmental improvements through a reduced carbon footprint (Masud et al., 2018), while providing economic benefits by improving asset quality (Biswas, 2011). Dharwal and Agarwal (2013) recommend green banking to mitigate credit, legal, and reputation risks.

However, banks face challenges implementing green banking, including a novel concept requiring client adaptation, high technology costs, expensive renewable and recycling methods, data security concerns, and the need for personnel education on green practices (Gupta, 2015).

2.3 | Theoretical Frameworks

This study underpins three interrelated theoretical frameworks. Stakeholder Theory (Freeman, 1984) supports that companies undertake environmentally conscious initiatives to fulfill the expectations and requirements of various stakeholder groups, including consumers, investors, governments, and the community as a whole, as their support is essential for long-term organizational survival. For green banking, this implies banks will invest in green products and operations to meet the expectations of sustainability-conscious stakeholders. Whereas Institutional Theory (DiMaggio & Powell, 1983) suggests organizational conduct is influenced by coercive, normative, and mimetic forces within the institutional environment. Coercive pressures include regulatory requirements, such as SBP green banking guidelines, normative pressures arise from industry norms and professional associations, whereas mimetic pressures are created because of banks imitating successful peers. Institutional theory, therefore, explains uneven diffusion of green banking practices across geographies and organizations. Sustainability Performance Models (Elkington & Rowlands, 1999)

conceptualize corporate performance within a framework termed as “Triple Bottom Line,” which encompasses economic, environmental, and social aspects. This framework transcends green banking from mere minimization of environmental harm to a broad emphasis on the creation of social value through community financing and economic returns facilitated by cost savings and emerging market opportunities.

Most empirical investigations in green banking that explored these theories have found mixed results. For example, Rehman et al. (2021) showed that coercive institutional and operational pressures have a stronger influence on green practice adoption in Pakistani banks than stakeholder-driven pressures. In contrast, Sohail et al. (2023) focus on the impact of customer and investor demand to drive the provision of green credit cards and eco-loan services, consistent with stakeholder theory. These seeming contradictions reinforce the need for our research's structural equation model to ascertain the relative influence of stakeholders over institutional pressures on green banking practices and their environmental outputs.

2.4 | Regional and National Context

Ali et al. (2020) found that Islamic bankers' green behavior positively influences green banking development in Malaysia. Risal and Joshi (2018) discovered that energy-efficient equipment and green policies significantly impact Nepalese banks' environmental performance. Green banking practices, such as environmental education, energy-efficient operations, green finance, and policies, enhance environmental performance (Vidyakala, 2020). Shaumya and Arulrajah (2017) confirmed a significant link between green banking practices and environmental performance in Sri Lankan banks.

Pakistan, like other developing countries, faces unprecedented environmental pressures due to rapid population growth, urbanization, and infrastructure development (Falcone & Sica, 2019). Meeting global environmental requirements is crucial for transitioning to a green economy (Raberto et al., 2019). The country's environmental challenges include resource depletion and degradation from construction activities Aizawa and Yang (2010), catastrophic weather events impacting infrastructure, health, productivity, and wealth Mumtaz and Smith (2019), and disrupted economic development and business activity. The rollout of green banking faces persistent obstacles

Despite these challenges, Pakistan has abundant natural resources, including biomass and agricultural waste for energy production, the ability to harness 2.3 million megawatts of solar energy annually, and the potential to manufacture biofuels and ethanol fuels. However, limited green financing is a primary constraint to exploring and developing these resources. The banking industry plays a crucial role in addressing environmental challenges through green finance, providing low-interest loans to enterprises (Rehman et al., 2021).

Green banking prioritizes economic, social, and ecological considerations to conserve the environment and natural resources (Sharma & Kumar, 2024). In Pakistan, green banking is critical for long-term economic success and essential for achieving sustainable development goals (SDGs) and combating climate change. Green finance is a comprehensive concept that includes green banking as a central component (Sarma & Roy, 2021).

2.5 | Environmental Performance of Banks and Green Banking Practices

Environmentally friendly banking, or green banking, is gaining popularity worldwide, focusing on preserving natural resources and maintaining a livable planet (Shaumya & Arulrajah, 2017). Despite banking not being considered a polluting industry, its large-scale activities have increased banks' carbon footprint due to energy consumption, paper waste, and a lack of green buildings. Researchers argue that green banking mitigates negative environmental impacts through environmentally friendly actions (Azman, 2012; Bai, 2011; Singh & Singh, 2012). Green banking encourages companies to expand sustainably and repair the natural world (Bhardwaj & Malhotra, 2013). It involves executing financial operations while considering social and environmental consequences (Biswas, 2011; Jha & Bhome, 2013).

Environmental performance in the banking sector can be evaluated via metrics, such as energy intensity, carbon emissions, waste reduction, and recycling activities (Lober, 1996; Risal & Joshi, 2018). Adopting environmentally friendly policies and practices enhances banks' environmental performance by reducing negative impacts and increasing positive effects. Studies have shown that green banking practices significantly impact environmental performance.

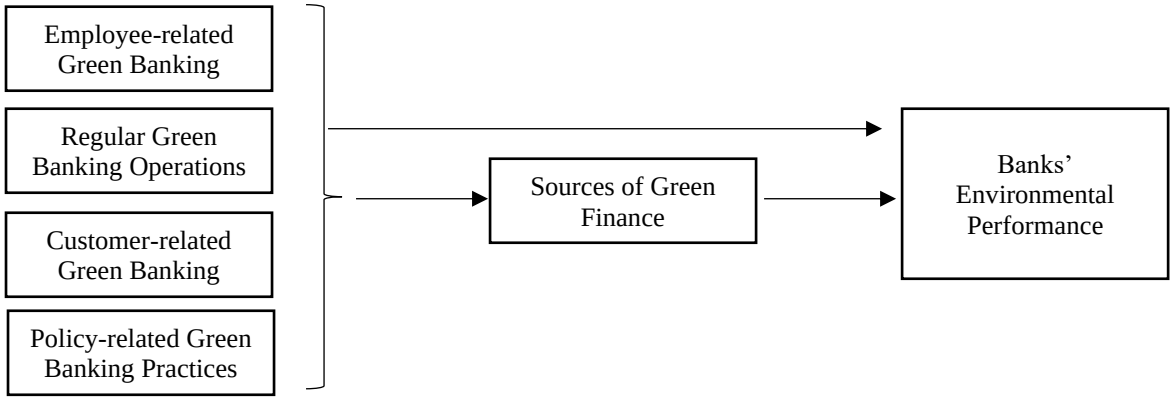
Today, true economic success means meeting our needs without stealing from tomorrow. By backing eco-friendly projects, adopting energy-efficient operations, and rolling out green financial products, banks can improve their environmental impact, enhance their reputation, and lay the groundwork for lasting, sustainable growth.

3 | METHODOLOGY & DESIGN

Our theoretical framework (see Figure 1.1) represents a distinct form of institutional or shareholder pressure from the preceding theories through each of the four green-practice constructs. Policy-related practices capture the State Bank of Pakistan's coercive green banking guidelines compelling banks into environmentally friendly policymaking. Customer-related practices capture stakeholder pressure for sustainable products, registering banks' response to growing expectations among customers and investors. Employee-related policies capture normative pressures within a bank's professional culture, were internal culture and training shape staff behaviors toward environmental responsibility. Regular green banking operations capture both mimetic pressures (banks copying successful peers) and operational dimensions of Elkington's Triple Bottom Line, which highlight the aspect of day-to-day practices into environmental outcomes. These four constructs converge on sources of Green Finance, which are modeled as mediators representing how regulatory, market, and cultural pressures translate into tangible capital benefits, and then measure the final environmental performance of banks as our outcome variable.

Figure 1

Research Model



Based on the above discussion and research model, the following research hypotheses are presented:

H1: *Employee-related green banking policies significantly impact sources of green finance.*

H2: *Banks' green banking practices in everyday operations significantly impact sources of green financing.*

H3: *Customer-related green banking practices significantly impact sources of green financing.*

H4: *Banks' green banking policy practices significantly influence green finance sources.*

H5: *Sources of green finance used by banks significantly impact environmental performance.*

H6: *Employee-related green banking policies significantly impact banks' environmental performance.*

H7: *Banks' green banking practices in everyday operations significantly impact environmental performance.*

H8: *Customer-related green banking practices significantly impact environmental performance.*

H9: *Banks' green banking policy practices significantly influence environmental performance.*

H10: *Banks' green banking practices in everyday operations significantly impact environmental performance through mediating role of green finance.*

H11: *Banks' policy-related green banking practices significantly impact environmental performance through mediating role of green finance.*

H12*: Customer-related green banking practices significantly affect environmental performance through sources of green finance as a mediating variable.*

H13: *Employee-related green banking policies significantly impact environmental performance through the mediating role of green finance.*

4 | RESULTS and ANALYSIS

This study aims to investigate environmentally responsible banking practices in Pakistan, focusing on Islamic and conventional banks. The primary objective is to determine Pakistani bankers' perceptions of green finance and identify obstacles hindering its widespread adoption.

This study employs a cross-sectional, non-contrived, natural setting approach, a quantitative survey-based design relying on primary data collected through a predefined questionnaire. By combining both Islamic and conventional bank employees, we ensure the design reflects Pakistan's dual banking system in its natural context.

The sample size for this study was 150 bank employees from both Islamic and conventional banks. Non-probability sampling was employed to select the respondents, which is a well-established approach in SEM research when sampling frames are not fully accessible (Wagner & Grimm, 2023), and a five-point Likert scale was used for measuring the responses. This sample size1 meets the "10 x rule" recommendation (ten times the maximum number of paths leading into a construct) and aligns with PLS-SEM guidelines for models with 24 indicators (Chin, 1998; Wagner & Grimm, 2023).

Our instrument comprises of 24 measurement items across six constructs, 16 items for green banking practice (four items each for employee-related, daily operations, customer-related, policy-related sub-constructs), four items for sources of green financing, and four items for banks' environmental performance, plus demographics section (with five items including age, gender, education, employment duties, and work experience). Items were adapted from validated scales in Rehman et al. (2021), Sohail et al. (2023), and Imran et al. (2024), ensuring theoretical fidelity2.

To mitigate common-method bias, we (1) randomized item order, (2) assured respondents of anonymity, and (3) conducted Harman's single-factor test via unrotated exploratory factor analysis on all 24 measurement items. The first factor did not account for a majority of the variance (well below the 50% threshold; (Podsakoff et al., 2003) indicating that common-method bias is unlikely to threaten our findings.

The data were then analyzed using Structural Equation Modelling (SEM), specifically Partial Least Squares SEM (PLS-SEM), due to its effectiveness in examining measurement model (validity and reliability) across diverse population groups, which is effective for handling complex relationships and non-normal data distributions, as identified by (Foldnes & Grønneberg, 2022).

The two-stage PLS-SEM Process was employed. Measurement model assessment was examined in the first stage. The measurement model assesses latent constructs' measurement characteristics, demonstrating how observable variables measure them. This study uses six variables, including employee-related green banking practices, customer-related green banking practices, daily operation-related green banking practices, policy-related green banking practices, sources of green financing, and banks' environmental performance. These variables are measured through 24 items. Smart PLS software is used to evaluate reliability and validity. The second stage involved testing the structural model evaluation, which examines the relationships between the latent constructs, hypothesis testing, assessing collinearity, and effect size measurement of independent variables on dependent variables.

[1] Moreover, a G*Power analysis confirms that N=150 yields over 0.80 statistical power to detect medium sized effects (f^2=0.15) at α=0.05 in a six-construct model.

[2]Content-validation panel of three banking sustainability experts reviewed the draft survey, resulting in minor wording refinements. A pilot test with 15 respondents confirmed clarity and reliability (Cronbach's α > 0.75 on all constructs).

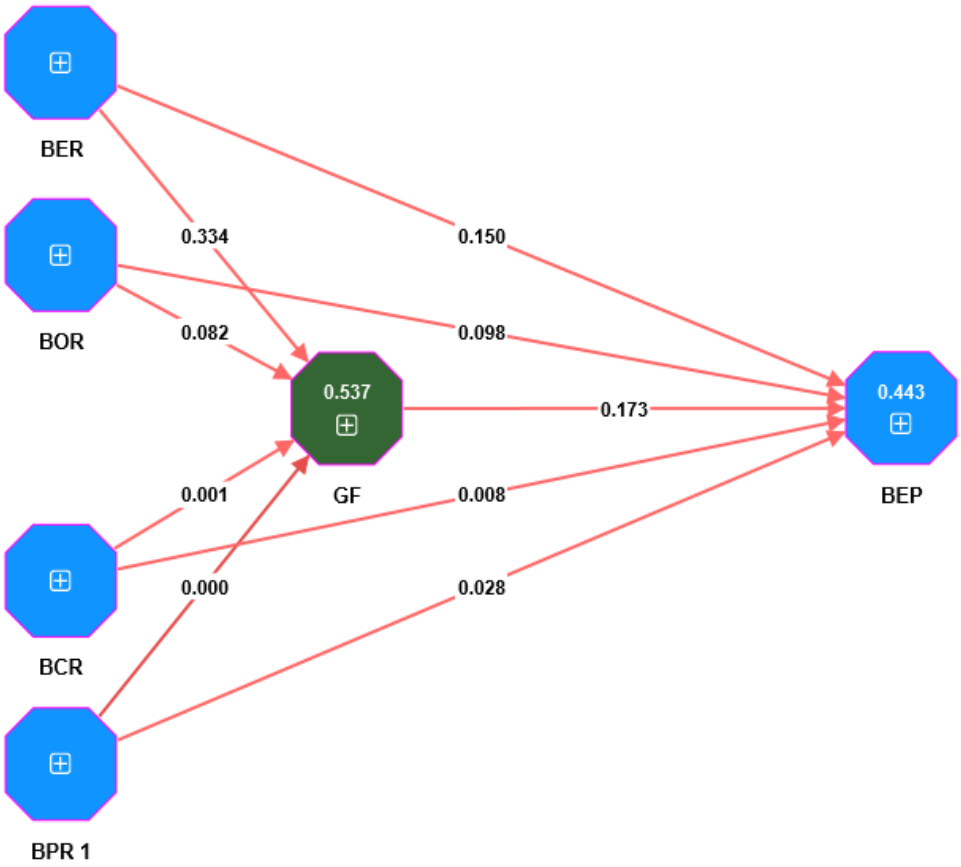
By employing PLS-SEM, this study ensures a comprehensive analysis of the complex relationships between green banking practices and environmental performance. For reliability analysis, Cronbach's alpha coefficient is used to measure internal consistency.

4.1 | Findings

4.1.1. **Measurement Model Evaluation**: After building the model in Smart PLS software, we ran the PLS algorithm (300 maximum iterations, path weighting scheme). The outer loadings ranged from 0.675 (BCR8) to 0.850 (BOR 5), exceeding the 0.70 benchmark, indicating strong individual reliability reflecting sufficient contribution to their respective constructs.

Figure 2

Initial Measurement Model (Baseline Version)



According to Jani et al. (2023), loadings above the 0.60 threshold are also acceptable in exploratory research, which justifies the retention of item BCR8 (0.675), BOR6 (0.670), BOR7 (0.683), BPR14 (0.678), and BPR16 (0.694). These values, despite being lower than 0.70, are a meaningful contributor to shared variance within their construct. However, BOR4 and BPR13 displayed loading values below 0.40, indicating poor correlation with their intended constructs, which is not acceptable, and were removed from the PLS-SEM Analysis. A refined model reflecting these changes and robust statistical measures is shown in Figure 03, with R^2 values for GF (0.537) and BEP (0.443) representing moderate explanatory power.

Figure 3

Final Measurement and Structural Model

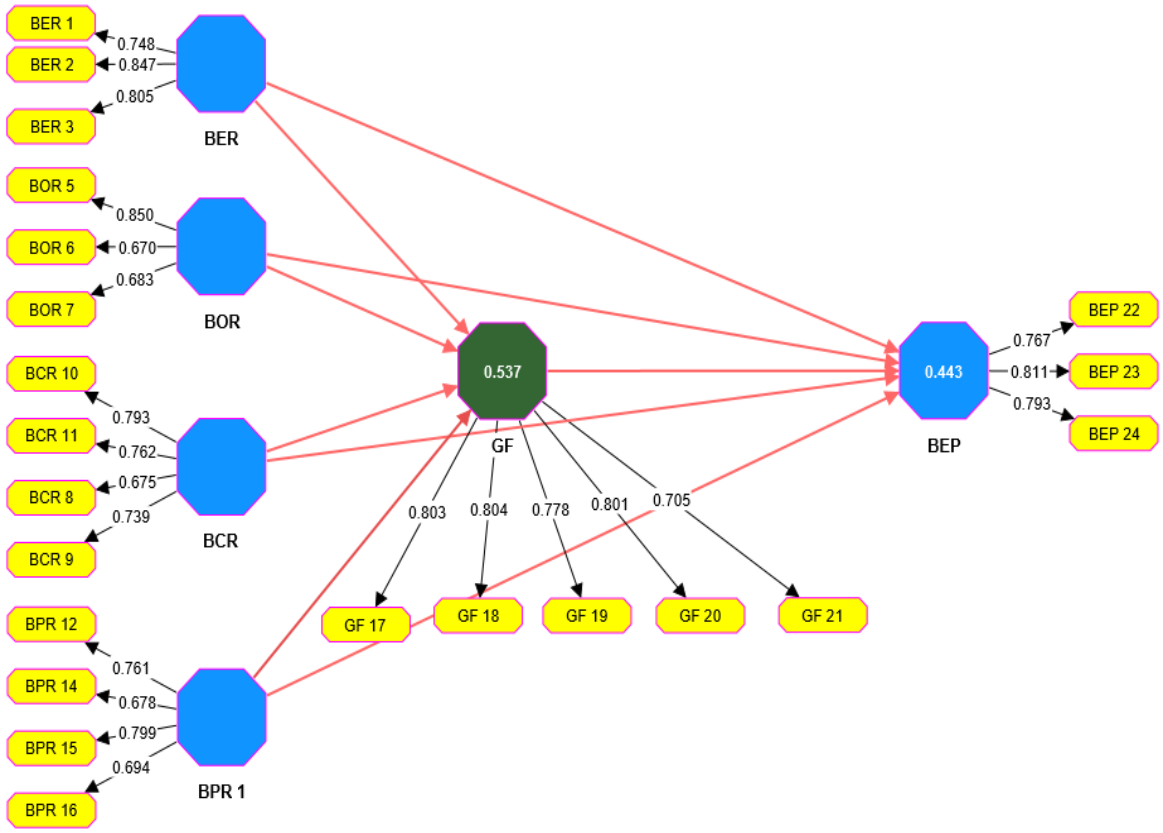


Table 1

Outer Loading

Item Code	Factor Loadings
	Customer-Related Green Banking Practices
BCR 10	0.793
BCR 11	0.762
BCR 8	0.675
BCR 9	0.739
	Banks' Environmental Performance
BEP 22	0.767
BEP 23	0.811
BEP 24	0.793
	Employee-Related Green Banking Practices
BER 1	0.748
BER 2	0.847
BER 3	0.805
	Regular/Daily Green Banking Operations
BOR 5	0.850
BOR 6	0.670
BOR 7	0.683
	Policy Related Green Banking Practices
BPR 12	0.761
BPR 14	0.678
BPR 15	0.799

BPR 16		0.694
	Sources of Green Financing	
GF 17		0.803
GF 18		0.804
GF 19		0.778
GF 20		0.801
GF 21		0.705

The convergent validity is seen by using Cronbach's alpha, rho A, Composite Reliability (CR), and Average Variance Extracted (AVE). The convergent validity of this study is shown in the table below:

Table 2

Construct Reliability and Validity

	Cronbach's alpha	**rho_A**	**Composite reliability**	**Average Variance Extracted (AVE)**
BCR	0.730	0.734	0.831	0.553
BEP	0.702	0.707	0.833	0.625
BER	0.720	0.721	0.843	0.642
BOR	0.582	0.613	0.781	0.546
BPR	0.716	0.729	0.824	0.540
GF	0.838	0.843	0.885	0.607

The result in Table 2 shows that Composite Reliability (CR), Cronbach's alpha, and rho A for all above constructs are meeting the criteria for internal consistency reliability with a value of above 0.7, except the Banking Operations Related (BOR) construct. Moreover, each of our constructs had an Average Variance Extracted (AVE) score above 0.50, confirming convergence validity as suggested by Fornell and Larcker (1981), which indicates that more than half of the variation within each construct is captured. Even though the Cronbach's alpha for the BOR construct came lower than the usual cutoff of 0.70 at 0.582, it doesn't mean we have to eliminate it. Composite Reliability (CR) is generally seen as a stronger and more fitting way to measure internal consistency in PLS-SEM, especially working with exploratory models. In our case, BOR's CR is 0.781 and AVE is 0.546, both of which surpass acceptable thresholds (CR > 0.70 and AVE > 0.50). This tells us the construct has good enough internal consistency and convergent validity.

The lower alpha might hint that some items are overlapping or weak cohesion among BOR items, but we kept the construct because its CR and AVE, which are more meaningful in the context of this exploratory model. Still, it'd be smart for future research to think about tweaking or rephrasing the BOR indicators to make the scale more solid and clear from a psychometric standpoint.

Overall, the above table shows that the values of convergent validity are at an acceptable level of internal consistency and convergent validity.

4.1.2. **Discriminant Validity**: This measure shows to what extent the variables are different from each other. Smart PLS shows discriminant validity in three different criteria. When the square root of the construct's AVE exceeds the inter-item correlation, a measurement model has discriminating validity. It demonstrates that the construct's related items have greater variation than other things.

We looked at discriminant validity two ways, by first using the "Fornell-Larcker" criterion and then checking: Cross-loadings". However, we believe that the Heterotrait-Monotrait Ratio of Correlations (HTMT) is the most rigorous test, so we focused our analysis on those HTMT findings for discriminant validity. "HTMT is the mean of all correlations of the indicators measuring different constructs, relative to the geometric mean of the average correlations of the indicators measuring the same construct". The values of this measure should be less than 0.90, which means the variables are different from each other. Note that the BPR-GF HTMT value of 0.883 approaches to 0.900 threshold, but remains acceptable (Henseler et al., 2015). This proximity to the 0.90 threshold suggests that banks' green policy initiatives may be deeply embedded within or even indistinct from their financing strategies.

For this study, all the values of HTMT are less than 0.90 (which shows that the model is satisfactory).

Table 3

Discriminant Validity - Heterotrait - monotrait ratio (HTMT)

	BCR	BEP	BER	BOR	BPR	GF
BCR						
BEP	0.794					
BER	0.645	0.61				
BOR	0.764	0.695	0.681			
BPR	0.872	0.810	0.736	0.750		
GF	0.759	0.681	0.511	0.647	0.883	0.000

4.2 | Structural Model & Hypotheses Testing

4.2.1. Assessment of Structural Model: When the outer model is valid, it leads to the evaluation of the inner path model. The statistical significance of the path loadings and path coefficients between each construct is determined in the second step. For the assessment of the Structural model, researchers use the Bootstrap technique to find the relationships among variables. For assessing the structural model, 3 criteria were used, and they are collinearity assessment, path coefficient (Beta) that indicates the strength of the relationship between variables, R-Square (R2) known as regression score.

4.2.2. Assessment of Collinearity: In PLS-SEM, the analysis is based on Ordinary Least Squares (OLS) regression of every independent variable. To assess collinearity among variables, it is important to remove biased estimates, if any. For the degree of multicollinearity in a regression model, the Variance Inflation Factor (VIF) is used. It is a statistical measure of how much the model's other independent variables impact the regression coefficients.

Table 4

Collinearity Statistics (VIF) - Inner Model

	BEP	BER	BOR	BPR	GF
BCR	2.005	0.000	0.000	0.000	1.881
BEP	0.000*	0.000	0.000	0.000	0.000
BER	1.519	0.000*	0.000	0.000	1.517
BOR	1.522	0.000	0.000*	0.000	1.503
BPR	2.552	0.000	0.000	0.000*	1.974
GF	2.161	0.000	0.000	0.000	0.000*

**Cells marked '0.000' refer to the construct's own VIF, which is not computed in SmartPLS output*

Multicollinearity is present when the Variance Inflation Factor (VIF) has a high value. Higher values of VIF indicate levels of multicollinearity that may have a detrimental influence on the regression model, and the conventional threshold for VIF is 3. In Smart PLS, we generate the Variance Inflation Factor (VIF) to check if there is multicollinearity. The values higher than 3 show high collinearity. In our model, all the values are quite below the threshold, and there is no issue of collinearity found among the variables.

Table 5

Path coefficients - Mean, Std. Dev., T values, p values

	Hypothesis	Original Sample	Sample Mean	Std. Dev.	T statistics	P values
H1	BCR ® BEP	0.251	0.253	0.104	2.402	0.008
H2	BCR ® GF	0.240	0.248	0.077	3.099	0.001
H3	BER ® BEP	0.094	0.098	0.091	1.038	0.150
H4	BER ® GF	-0.031	-0.037	0.073	0.43	0.334
H5	BOR ® BEP	0.118	0.129	0.091	1.295	0.098
H6	BOR ® GF	0.094	0.099	0.068	1.397	0.082
H7	BPR ® BEP	0.228	0.231	0.119	1.923	0.028
H8	BPR ® GF	0.517	0.512	0.076	6.845	0.001
H9	GF ® BEP	0.128	0.110	0.136	0.943	0.173

The SEM is used to test the research hypotheses, and the results are presented in Tables 5 and 6. According to the results in Table 5, Banks' customer-related practices and Banks' policy-related practices have a significant positive impact on banks' environmental performance, thus validating H1 and H7, respectively. The Banks' customer-related practices and Banks' policy-related practices also have a significant positive effect on the sources of green financing, thereby validating research Hypotheses 2 and 8.

Structural model revealed that five hypothesized relationships didn't turn out to be statistically significant, including H3 (BER®BEP), H4 (BOR®GF), H5 (BOR®BEP), H6 (BCR®GF), and H9 (GF®BEP). These findings are valuable in understanding the limitations within the current context and dataset. H3 (BER®BEP)

H5: (BOR → BEP) non-significant relationship between Banking Environmental Responsibility (BER) and Banking Environmental Performance (BEP) suggests that banks need long-term integration of new

environmental policies before they start seeing real results. H4 (BOR → GF) lack of significant association between Banking Operational Reforms (BOR) and Green Finance (GF) could imply that changes in processes or using new technology do not result in an immediate change in the financing behavior of emerging green markets. H5 (BOR → BEP) insignificance suggests that while operational reforms may improve efficiency, they may not be perceived as contributing to environmental performance unless explicitly tied to green KPIs or sustainability-linked outcomes. H6 (BCR → GF) point out toward insignificant relationship between Corporate Responsibility (BCR) and Green Finance (GF), which could be linked to CSR efforts in banking sectors, which remain largely reputational, without clear channels to influence financing structures. It could also indicate a disconnect between CSR messaging and actual product-level green finance innovation. H9 (GF → BEP) insignificance was most unexpected, suggesting Green Finance (GF) did not significantly predict Banking Environmental Performance (BEP). This may reflect the immaturity of green finance markets in the region studied, where green funds are either too limited in scale or not yet tied to measurable performance outcomes. Alternatively, green finance may function as a signal rather than a direct driver of environmental improvements.

In sum, these non-significant paths offer important insights into where theory may not fully translate into early-stage empirical contexts, helping refine future conceptualizations of green banking in developing markets.

4.3 | Mediation Analysis

Mediation analysis of this study focused on the role of Green Finance (GF) as a potential mediator between various organizational factors (e.g., BCR, BER, BOR) and Banking Environmental Performance (BEP). Table 6 shows the outputs from the mediation analysis. Insignificant values of research of hypotheses 10, 11, 12, and 13 suggest that the role of green financing as a mediator between green banking practices and banks' environmental performance is not supported.

Table 6

Specific indirect effects - Mean, Std. Dev., T values, p values

	Hypothesis	Original Sample	Sample Mean	Std. Dev.	T statistics	P values
H10	BOR ® GF ® BEP	0.012	0.008	0.016	0.743	0.229
H11	BPR ® GF ® BEP	0.066	0.056	0.072	0.923	0.178
H12	BCR ® GF ® BEP	0.031	0.027	0.037	0.841	0.200
H13	BER ® GF ® BEP	-0.004	-0.001	0.013	0.315	0.376

The results showed that Green Finance (GF) may not yet act as robustly between institutional reforms organized and environmental outcomes in the studied context. Instead, GF might be functioning more as a strategic buffer rather than a fully institutionalized mechanism for delivering measurable environmental results. These results underscore those green financial mechanisms might require broader regulatory alignment, investor maturity, and cultural buy-in before they can meaningfully mediate the relationship between internal reforms and environmental performance.

Thus, while the lack of mediation might seem like a limitation, it in fact points to a critical developmental insight: that green finance infrastructures must be deeply embedded within both policy and practice to serve as effective levers of environmental change.

4.4 | Model Fit & Explanatory Power

Table 7 presents the explanatory power of our structural model. The values of R-squared range between 0 and 1. The values close to one show higher predictive accuracy and vice versa. This study reports that the R-squared for Banking Environmental Performance (BEP) is 0.443, and for Sources of Green Finance (GF) is 0.537, with their respective adjusted values being 0.422 and 0.524. Sarstedt et al. (2021) argued that R-square values around 0.26 are considered moderate, while values above 0.50 can be interpreted as substantial in social science research. These results therefore indicate that our model exhibits moderate-to-high explanatory power, particularly for Sources of Green Finance.

Our R-squared values exceed typical benchmarks observed in organizational behavior studies (0.20–0.30), indicating that our set of green-practice predictors captures a substantial proportion of variance in both outcomes.

Table 7

R-Square

	R-square	R-square Adjusted
BEP	0.443	0.422
GF	0.537	0.524

5 | DISCUSSION

The study's findings provide valuable insights into green banking practices in Pakistan, shedding light on the current state of environmental responsibility in the banking sector. The research assists other institutions in incorporating green banking practices efficiently. Green banks can evaluate their strengths and weaknesses by comparing themselves to peers. The study supports and encourages green banking practices in Pakistan's banking industry, addressing identified knowledge gaps. This study also educates bank employees about green banking practices, fostering future adoption. By examining green banking practices in Pakistan, this study contributes to long-term environmental protection and management. The findings of this study contribute to the development of sustainable banking practices, ultimately benefiting the environment and the banking industry as a whole.

To promote green banking effectively, banks should focus on increasing customer awareness and education about environmentally responsible banking services. Educating customers on sustainable credit card usage and green banking services can help advance sustainability goals. Additionally, banks should adopt sustainable practices in their operations, such as using energy-saving lights, investing in renewable energy sources like solar and wind power, and offering customer-friendly mobile and online banking options. Banks could also encourage environmentally conscious decisions by providing green car loans for fuel-efficient and

hybrid vehicles. Incentives and rewards can further motivate customers to adopt eco-friendly banking habits, such as awarding environmental points for sustainable banking activities or offering green credit cards with financial incentives for using renewable energy sources like solar, biogas, wind, and hydropower (Ullah et al., 2024). Promoting societal activities like clean-up events can also raise awareness. Engaging stakeholders is another crucial step; banks should involve key participants and work to enhance public understanding of green banking's benefits for the economy, environment, and society. Developing policies that support environmental sustainability will also contribute to these efforts. Moreover, government support can play a vital role by providing incentives for leading green units, thereby encouraging the widespread adoption of environmentally responsible banking practices. Finally, supporting eco-friendly innovations will boost the credibility of green banking initiatives and foster long-term sustainability (Biswas, 2011). By implementing these strategies, banks can mitigate environmental risks and contribute meaningfully to a sustainable future.

While the study offers valuable insights, it does have some limitations to keep in mind. Firstly, because it was a cross-sectional design, following the same institutions over a longer period (longitudinal data) would give us a clearer picture of how green banking strategies play out over time. Secondly, the data only covers urban areas, so we're missing perspectives from, for example, rural areas or specialized development financial institutions, which might have different priorities and ways of operating. Lastly, some of the concepts we measured, especially environmental performance (BEP), are somewhat subjective, which could have introduced some bias in the responses, even though we used questions that have been thoroughly tested and proven reliable.

6 | CONCLUSION

The study only included bank personnel, which restricts the applicability of the results to the population as a whole. Future studies could enhance the results by assessing various stakeholders, such as customers and owners, of banks and non-bank financial organizations. Future research can also explore the impact of environmental performance and profitability on green banking practices and green financing sources. This study is also limited to only two cities in Pakistan, which may not be generalizable to the whole country. These limitations provide opportunities for future research to address these gaps.

Future studies can enhance understanding of green banking practices by expanding sample sizes and geographic representation, investigating corporate-level policies and national regulations, conducting comparative studies between countries, and between national/international banks. Consumer awareness, employee attitudes, and longitudinal trends can add new dimensions to existing literature. Further studies on exploring the role of government regulation and central bank intervention as moderators or mediators in shaping green finance can also be conducted. Integrating green banking with sustainable development goals and fintech/digital banking can be a potential area for further research. These directions can deepen the understanding of green banking's potential for a sustainable future.

Acknowledgment: The authors would like to express their sincere thanks to the editor and the anonymous reviewers for their helpful comments and suggestions.

Author Contributions: Conceptualization, M.T., O.M., and M.K.S; methodology, M.T., and M.K.S; software, O.M.; validation, M.K.S.; investigation, M.T., and O.M.; data curation, M.T.; writing original draft preparation, M.T., O.M.; writing—review and editing, M.T., and O.M. All authors have read and agreed to the published version of the manuscript.

Declaration of Conflicting Interest: The author(s) declared no potential conflicts of interest with respect to the research, authorship, and/or publication of this article.

Funding: The author(s) received no financial support for the research, authorship, and/or publication of this article.

Data Availability Statement: Data that support the findings of this study are available on request from the corresponding author.

Plagiarism Statement: This article was scanned by the plagiarism program. No plagiarism was detected.

Disclaimer/Publisher's Note: The statements, opinions, and data contained in all publications are solely those of the individual author(s) and contributor(s) and not of the publisher "AGASR" and/or the editor(s). The Publisher AGASR and/or the editor(s) disclaim responsibility for any injury to people or property resulting from any ideas, methods, instructions, or products referred to in the content.

REFERENCE

Aizawa, M., & Yang, C. (2010). Green credit, green stimulus, green revolution? China's mobilization of banks for environmental cleanup. *The Journal of Environment & Development*, *19*(2), 119-144.

Ali, Q., Parveen, S., Senin, A. A., & Zaini, M. Z. (2020). Islamic bankers' green behaviour for the growth of green banking in Malaysia. *International Journal of Environment and Sustainable Development*, *19*(4), 393-411.

Azman, S. (2012). Green Corporate Environment Thru'Green Banking and Green Financing. *The Financial Express*, *4*.

Bahl, S. (2012). The role of green banking in sustainable development. *International Journal of Marketing, Financial Services & Management Research*, *1*(2), 27-35.

Bai, Y. (2011). Financing a green future. *Lund, Sweden*.

Bashir, S., Sarker, T., Talib, M. N. A., & Akram, U. (2023). Financing options for green and affordable housing (GAH): an exploratory study of South Asian economies. *Sustainability*, *15*(15), 11645.

Bhardwaj, B. R., & Malhotra, A. (2013). Green banking strategies: sustainability through corporate entrepreneurship. *Greener Journal of Business and Management Studies*, *3*(4), 180-193.

Biswas, N. (2011). Sustainable green banking approach: The need of the hour. *Business Spectrum*, *1*(1), 32-38.

Bukhari, S. A. A., Hashim, F., & Amran, A. (2020). The journey of Pakistan's banking industry towards green banking adoption. *South Asian Journal of Business and Management Cases*, *9*(2), 208-218.

Ch, S. (2014). A study of green banking initiatives of selected private and public sector banks in India. *International journal of Research (IJR)*, *1*(7), 807-815.

Chaurasia, A. K. (2014). Green banking practices in Indian banks. *The Journal of Management and Social Science*, *1*(1), 41-54.

Chin, W. W. (1998). The partial least squares approach to structural equation modeling. In *Modern methods for business research* (pp. 295-336). Psychology Press.

Dharwal, M., & Agarwal, A. (2013). Green banking: An innovative initiative for sustainable development. *ACCMAN Institute of Management Article*, *2*(3), 1-7.

DiMaggio, P. J., & Powell, W. W. (1983). The iron cage revisited: Institutional isomorphism and collective rationality in organizational fields. *American sociological review*, *48*(2), 147-160.

Elkington, J., & Rowlands, I. H. (1999). Cannibals with forks: The triple bottom line of 21st century business. *Alternatives Journal*, *25*(4), 42.

Falcone, P. M., & Sica, E. (2019). Assessing the opportunities and challenges of green finance in Italy: An analysis of the biomass production sector. *Sustainability*, *11*(2), 517.

Foldnes, N., & Grønneberg, S. (2022). The sensitivity of structural equation modeling with ordinal data to underlying non-normality and observed distributional forms. *Psychological Methods*, *27*(4), 541.

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

Freeman, R. E. (1984). Strategic management: a stakeholder approach (Boston: Pitman, 1984). *Jennings, in the article cited above, quotes Freeman and gives additional information concerning the influence of his work*.

G20 Green Finance Synthesis Report. (2016). G. G. F. S. Group. https://g20sfwg.org/

Ginovsky, J. (2009). Green banking-Inside and out. *Community Banker*, *1*(1), 30-32.

Goel, R. K., & Saunoris, J. W. (2016). Virtual versus physical government decentralization: Effects on corruption and the shadow economy. *Public Budgeting & Finance*, *36*(4), 68-93.

Gupta, J. (2015). Role of green banking in environment sustainability: A study of selected commercial banks in Himachal Pradesh. *International Journal of Multidisciplinary Research and Development*, *2*(8), 349-353.

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*(1), 115-135.

Imran, R., Khan, M. J., & ud Din, S. (2024). THE IMPACT OF GREEN BANKING PRACTICES ON BANKS'COST OF CAPITAL; EVIDENCE FROM A DEVELOPING COUNTRY. *NUST Business Review*, *6*(2).

Jani, W., Razali, F., Ismail, N., & Ismawi, N. (2023). Exploratory factor analysis: Validity and reliability of teacher's knowledge construct instrument. *International Journal of Academic Research in Progressive Education and Development*, *12*(1), 944-953.

Jha, N., & Bhome, S. (2013). A study of green banking trends in India. *International Monthly Referred Journal of Research in Management and Technology*, *2*, 127-132.

Khedekar, P. (2014). Banking with Technology: GreenBanking. *Renewable Research Journal*, *3*(1), 167-171.

Lindenberg, N., & Volz, U. (2016). Green banking regulation: setting out a framework. *Report for the Practitioners 'Dialogue on Climate Investments (PDCI). Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*.

Lober, D. J. (1996). Evaluating the environmental performance of corporations. *Journal of Managerial Issues*, 184-205.

Masud, M. A. K., Hossain, M. S., & Kim, J. D. (2018). Is green regulation effective or a failure: comparative analysis between Bangladesh Bank (BB) green guidelines and global reporting initiative guidelines. *Sustainability*, *10*(4), 1267.

Masukujjaman, M., & Aktar, S. (2013). Green banking in Bangladesh: A commitment towards the global initiatives. *Journal of Business and Technology (Dhaka)*, *8*(1-2), 17-40.

Mumtaz, M. Z., & Smith, Z. A. (2019). Green finance for sustainable development in Pakistan. *Ipri Journal*, *19*(2), 1-34.

Ngwenya, N., & Simatele, M. D. (2020). Unbundling of the green bond market in the economic hubs of Africa: Case study of Kenya, Nigeria and South Africa. *Development Southern Africa*, *37*(6), 888-903.

Niazi, A. A. K., Qazi, T. F., Butt, H. T., Niazi, I. A. K., & Basit, A. (2023). A structural analysis of barriers being faced by green banking initiatives in Pakistan. *Journal of Policy Research (JPR)*, *9*(2), 182-199.

Podsakoff, P. M., MacKenzie, S. B., Lee, J.-Y., & Podsakoff, N. P. (2003). Common method biases in behavioral research: a critical review of the literature and recommended remedies. *Journal of applied psychology*, *88*(5), 879.

Raberto, M., Ozel, B., Ponta, L., Teglio, A., & Cincotti, S. (2019). From financial instability to green finance: the role of banking and credit market regulation in the Eurace model. *Journal of Evolutionary Economics*, *29*(1), 429-465.

Ragupathi, M., & Sujatha, S. (2015). Green banking initiatives of commercial banks in India. *International Research Journal of Business and Management*, *8*(2), 74-81.

Rehman, A., Ullah, I., Afridi, F.-e.-A., Ullah, Z., Zeeshan, M., Hussain, A., & Rahman, H. U. (2021). Adoption of green banking practices and environmental performance in Pakistan: A demonstration of structural equation modelling. *Environment, Development and Sustainability*, *23*(9), 13200-13220.

Risal, N., & Joshi, S. K. (2018). Measuring green banking practices on bank's environmental performance: Empirical evidence from Kathmandu valley. *Journal of Business and Social Sciences*, *2*(1), 44-56.

Salvadó, J. A., de Castro, G. M., López, J. E. N., & Verde, M. D. (2013). Research Model. In *Environmental Innovation and Firm Performance: A Natural Resource-Based View* (pp. 79-87). Springer.

Sarma, P., & Roy, A. (2021). A Scientometric analysis of literature on Green Banking (1995-March 2019). *Journal of Sustainable Finance & Investment*, *11*(2), 143-162.

Sarstedt, M., Ringle, C. M., & Hair, J. F. (2021). Partial least squares structural equation modeling. In *Handbook of market research* (pp. 587-632). Springer.

SBP. (2024). State Bank of Pakistan. https://www.sbp.org.pk/smefd/circulars/2017/C8-Annex.pdf

Sharma, D., & Kumar, P. (2024). Prioritizing the attributes of sustainable banking performance. *International Journal of Productivity and Performance Management*, *73*(6), 1797-1825.

Shaumya, K., & Arulrajah, A. (2017). The impact of green banking practices on bank's environmental performance: Evidence from Sri Lanka. *Journal of Finance and Bank Management*, *5*(1), 77-90.

Singh, H., & Singh, B. P. (2012). An effective & resourceful contribution of green banking towards sustainability. *International Journal of Advances in Engineering Science and Technology*, *1*(2), 41-45.

Sohail, A., Saeed, A., & Khan, N. (2023). Green finance bridges the gap: Impact of green banking practices on environmental performance. *Gomal University Journal of Research*, *39*(3), 381-392.

Ullah, S., Ullah, H., & Kakakhel, S. J. (2024). Exploring Motivation and Barriers to Green Banking Practices in Khyber Pakhtunkhwa. *Journal of Managerial Sciences*, *18*(1), 01-34.

Vidyakala, K. (2020). A study on the impact of green banking practices on bank's environmental performance with special reference to Coimbatore city. *African Journal of Business and Economic Research*, *15*(3).

Wagner, R., & Grimm, M. S. (2023). Empirical validation of the 10-times rule for SEM. In *State of the art in partial least squares structural equation modeling (PLS-SEM) methodological extensions and applications in the social sciences and beyond* (pp. 3-7). Springer.

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.

Zheng, G.-W., Siddik, A. B., Masukujjaman, M., Fatema, N., & Alam, S. S. (2021). Green finance development in Bangladesh: The role of private commercial banks (PCBs). *Sustainability*, *13*(2), 795.

Zhixia, C., Hossen, M. M., Muzafary, S. S., & Begum, M. (2018). Green banking for environmental sustainability-present status and future agenda: Experience from Bangladesh. *Asian Economic and Financial Review*, *8*(5), 571-585.