

A conceptual study of the impact of green banking on the financial performance of banks

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Abstract

Green banking has emerged as an important approach for integrating environmental sustainability into banking operations, financing, investment, and risk management. This conceptual study examines the impact of green banking on the financial performance of banks through a review and synthesis of existing empirical literature. The study considers key dimensions of green banking, including green internal operations, digital banking, green financing, environmental risk management, and sustainable investment. The reviewed evidence indicates that green banking can contribute to profitability, operational efficiency, competitiveness, and risk management, although its financial benefits may not be immediate. Green finance emerges as an important mechanism through which green banking can influence financial performance, while implementation costs, asset quality, risk management, and time horizon can condition the outcomes. The study also identifies methodological and conceptual gaps in existing research, particularly the need for common measurement frameworks, longitudinal evidence, stronger causal identification, and greater use of bank-level financial and environmental-risk data. The study concludes that green banking is financially compatible with sustainable banking objectives, but its contribution to financial performance depends on effective implementation and the ability of banks to translate environmental practices into measurable financial and risk-management outcomes.

Keywords: Green Banking; Financial Performance; Green Finance; Environmental Risk Management; Sustainable Banking

Introduction

The banking sector plays a vital role in economic development by mobilising savings, allocating financial resources, facilitating investment, and supporting business activities. Although banking institutions are generally considered less resource-intensive than manufacturing and other industrial sectors, their lending, investment, and operational decisions can have significant environmental consequences. Banks indirectly influence environmental sustainability through the projects and businesses they finance, while their own operations also involve the consumption of energy, paper, water, and other resources. Growing concerns regarding climate change, environmental degradation, resource depletion, and sustainable economic development have therefore encouraged financial institutions to integrate environmental considerations into their business strategies. This emerging approach has contributed to the development of the concept of green banking.

Green banking refers to the adoption of environmentally responsible practices by banks in their operations, products, services, lending decisions, and investment activities. It involves reducing the environmental impact of banking operations as well as directing financial resources towards environmentally sustainable activities. Practices such as paperless banking, digital banking, electronic transactions, energy-efficient branches and ATMs, renewable-energy financing, green loans, green bonds, environmentally responsible investment, and the assessment of environmental risks associated with lending are increasingly associated with green banking. Thus, green banking extends beyond the traditional objective of providing financial services and incorporates environmental sustainability into the strategic and operational decision-making of banks.

Financial performance represents the economic health and efficiency of a banking institution and is commonly assessed through indicators such as profitability, return on assets (ROA), return on equity (ROE), net interest margin, cost-to-income ratio, asset quality, and other financial measures. The relationship between green banking practices and financial performance has consequently become an important area of academic and managerial interest. Theoretically, investments in green banking may impose short-term costs on banks because of expenditure on

technology, infrastructure, employee training, environmental assessment systems, and sustainable financing initiatives. At the same time, such investments may generate long-term benefits through cost efficiency, improved risk management, enhanced reputation, customer loyalty, regulatory preparedness, and access to emerging sustainable-finance markets. The ultimate effect of green banking on financial performance may therefore depend on the nature, scale, and effectiveness of its implementation.

In India, the Reserve Bank of India has also increasingly addressed issues relating to sustainable finance, climate-related financial risks, and environmentally responsible banking practices. These developments indicate that environmental sustainability is gradually becoming an important component of the strategic environment in which banks operate. The Indian banking sector occupies a particularly important position in financing economic activities and supporting the country's transition towards sustainable development. Banks can influence environmental outcomes by determining which economic activities receive financial support and under what conditions. Financing renewable energy, energy efficiency, electric mobility, sustainable agriculture, green infrastructure, and environmentally friendly technologies can contribute to the transition towards a low-carbon economy. At the same time, incorporating environmental and climate-related risks into credit and investment decisions can strengthen the long-term resilience of banking institutions. Consequently, green banking can be viewed not merely as a corporate social responsibility initiative but as a potential component of strategic financial management.

Despite the increasing adoption of green banking practices, an important conceptual question remains regarding their implications for the financial performance of banks. The relationship is not necessarily straightforward. While some green banking practices may reduce costs and create new revenue opportunities, others may require considerable initial investments and may generate benefits only over the longer term. Moreover, factors such as bank size, technological capability, regulatory environment, customer awareness, competitive conditions, risk-management practices, and the maturity of sustainable-finance markets may influence the relationship between green banking and financial performance. Therefore, understanding the mechanisms through which green banking may influence financial outcomes is important for researchers, banking managers, regulators, investors, and other stakeholders.

Against this background, the present conceptual study examines the impact of green banking on the financial performance of banks. The study seeks to develop a conceptual understanding of how various dimensions of green banking, including green banking operations, digital and paperless banking, green financing, environmental risk management, and sustainable investment practices, may influence financial outcomes. The study also considers the potential direct and indirect benefits and costs associated with green banking adoption. By integrating the sustainability perspective with the financial-performance perspective, the study contributes to a broader understanding of whether environmental responsibility and financial objectives can be pursued simultaneously within the banking sector.

Literature Review:

This review focuses on four linked outcomes: profitability, operational efficiency, risk and asset quality, and broader competitive or sustainable performance. It compares the mechanisms proposed by the literature, evaluates methodological differences, and identifies where the current evidence is insufficient for strong causal claims. The review gives priority to primary empirical studies and uses studies of environmental performance where they clarify the financial mechanisms of green banking rather than treating environmental outcomes as substitutes for financial outcomes.

The literature defines green banking more broadly than green credit. Akhter et al. describe practices spanning client communication, marketing, service delivery, internal operations, project selection, and financing, while also examining implementation of central-bank policy guidelines (Akhter et al., 2020). Hossain et al. similarly operationalize green banking through green cost and the activity of the risk management committee, alongside financial indicators such as ROA, ROE, and market value (Md Imran Hossain, 2020). These formulations imply that green banking is a bundle of organizational capabilities: a bank must identify environmental risks, alter processes, allocate capital, and report on the resulting activities. Aslam and Jawaid

apply a resource-based perspective to green banking adoption and test financial, operational, and environmental performance simultaneously. Their survey of 360 usable responses from banking personnel in Pakistan reports positive effects of green banking adoption on all three outcomes, with the largest effect for environmental performance, followed by operational and financial performance (Aslam & Jawaid, 2022).

Chen et al. examine 322 employees of private commercial banks in Bangladesh using SEM and find that employee-, daily-operation-, and policy-related green practices significantly affect green financing, while customer-related practices do not show a statistically significant effect (Chen et al., 2022). The mediation argument is explicit in later survey research. Hazmi et al. report that green banking has a positive effect on sustainable bank performance and that green finance mediates the relationship (Hazmi et al., 2025). The studies use several performance measures: ROA, ROE, ROI, market value, net interest margin, operational performance, competitiveness, and broader sustainable performance. Hossain et al. use ROA, ROE, and market value as financial proxies (Md Imran Hossain, 2020), whereas Fitri et al. distinguish ROA, ROE, and net interest margin when examining an environmental risk index in Indonesian banks (Fitri et al., 2026). Budiarto et al. caution against treating ROA as the sole measure of performance: their Indonesian study finds no immediate profitability effect from green banking and argues that returns may materialize over a longer horizon (Arif Budiarto, 2023).

Research Work:

This research work compares the methodological differences across 14 studies and their findings. The studies differ substantially in evidentiary strength. Longitudinal bank-level studies using annual reports or financial statements provide more direct evidence on observed financial performance than cross-sectional perception surveys. Panel models can capture bank and time variation, although their credibility depends on controls, fixed effects, treatment of serial correlation, and endogeneity. Survey studies are useful for examining organizational capabilities, implementation processes, and perceived performance, but their results should not be interpreted as audited profitability effects. SEM and PLS-SEM can test mediation pathways such as green banking → green finance → performance, but they do not by themselves establish temporal precedence.

Study	Design and setting	Sample or dataset	Financial or performance outcome	Key finding	Citation
Akhter, Yasmin, and Faria (2020)	Annual-report analysis with correlation and regression, Bangladesh	Three years of reports from DSE-listed commercial banks, 2016–2018	ROA, ROE, ROI	Green banking implementation was widespread and positively influenced financial performance; several reporting, education, and climate-risk practices lagged.	(Akhter et al., 2020)
Hossain et al. (2020)	Panel-data study, Bangladesh	Listed banks, 2011–2020	ROA, ROE, market value	Green banking variables including green cost and risk-management-committee activity were positively related to financial performance.	(Md Imran Hossain, 2020)
Aslam and Jawaid (2022)	Cross-sectional questionnaire and PLS-SEM, Pakistan	360 usable banking-personnel responses	Financial, operational, environmental performance	Green banking adoption positively affected all three performance dimensions, with the largest effect on environmental performance.	(Aslam & Jawaid, 2022)
Chen et al. (2022)	Cross-sectional questionnaire and SEM, Bangladesh	322 employees of private commercial banks	Green financing and environmental performance	Employee-, daily-operation-, and policy-related practices affected green financing; green project financing positively influenced environmental performance.	(Chen et al., 2022)

Cardona Valencia and Calabuig (2023)	Cross-sectional questionnaire and SEM, Colombia	321 bankers selected by convenience sampling	Green financing and environmental performance	Green banking activities and green-financing sources positively affected environmental performance; competitiveness and reputation were proposed as longer-term channels.	(Valencia & Tormo, 2023)
Budiarto et al. (2023)	Quantitative documentation-based study, Indonesia	Banks participating in the Sustainable Finance Initiative, 13 members	Banking profitability and environmental performance	Green banking showed no immediate profitability effect, with potential returns expected over a longer horizon.	(Arif Budiarto, 2023)
Nwaobia, Kwarbai, and Awoniyi (2024)	Ex-post facto design and panel regression, Nigeria	11 quoted deposit money banks, 2012–2021	ROA	Green banking significantly affected ROA, with adjusted $R^2 = 0.09$.	(A et al., 2024)
Ghimire et al. (2026)	Eleven-year secondary-data regression, Nepal	All Nepalese commercial banks, FY 2070/71–2080/81	ROI and ROA	Green finance and CSR fund investment positively affected performance; digital banking supported efficiency and competitiveness.	(Ghimire et al., 2026)
Yadav and Dahiya (2026)	OLS and system GMM with moderation analysis, India	20 banks, 2019–2024	Financial performance	A green banking index and its subindices positively affected performance; non-performing assets weakened the relationship.	(Yadav & Dahiya, 2026)
Fitri et al. (2026)	Entropy-weighted environmental risk index and panel regression, Indonesia	Seven listed banks, 2018–2024	ROA, ROE, net interest margin	The index had no significant effect on ROA or net interest margin but negatively affected ROE, consistent with short-term transition costs.	(Fitri et al., 2026)

The comparison shows why the literature should be synthesized by design and outcome rather than by sign alone. The positive results are most persuasive when they use observed bank data over multiple years and address endogeneity. The survey studies are strongest for identifying organizational mechanisms and perceived implementation effects. The field still lacks many studies that combine both: detailed practice-level measures, audited outcomes, environmental-risk data, and a design capable of separating adoption from pre-existing bank quality.

The Research Gaps identified are:

First, the field needs a common measurement architecture. Studies should distinguish at least four components: green internal operations, green digital services, environmental risk management, and green lending or investment. Composite indices should report component scores so that researchers can determine whether financial effects arise from cost efficiency, asset allocation, risk reduction, or disclosure.

Second, causal identification remains limited. Future research should use bank and year fixed effects, lagged adoption measures, dynamic panel estimators, regulatory implementation thresholds, or carefully designed difference-in-differences analyses. The objective should be to test whether green adoption precedes performance improvement rather than merely correlates with it. Yadav and Dahiya's use of system GMM illustrates the direction, but more studies should report diagnostic tests, instrument validity, and sensitivity analyses (Yadav & Dahiya, 2026).

Third, time horizons must be made explicit. The Indonesian studies indicate that green banking may impose short-term costs without immediate effects on ROA or net interest margin and may

even reduce ROE during transition (Arif Budiarto, 2023; Fitri et al., 2026). Studies should model lagged effects and distinguish implementation expenditure from recurring operational savings. A one-year coefficient is not an adequate test of a strategy whose benefits may arise through gradual portfolio reallocation or lower credit losses.

Fourth, the literature needs better treatment of risk. Non-performing assets weaken the green banking–performance relationship in the Indian evidence (Yadav & Dahiya, 2026), while several studies include risk management only as a general policy variable. Research should examine whether environmental screening changes loan pricing, default probability, provisioning, collateral value, concentration risk, or recovery rates. These mechanisms would connect green banking to bank performance more convincingly than a broad adoption score.

Fifth, researchers should separate actual financing from symbolic commitment. Bangladesh evidence shows high implementation of broad guidelines alongside weaker reporting, client education, and climate-risk-fund practices (Akhter et al., 2020). Disclosure, policy statements, and awards may indicate institutional intent, but they do not demonstrate that credit allocation or risk management changed. Loan-level or project-level data are needed to establish whether green banking affects the asset side of the balance sheet.

Finally, geographic and institutional diversity should be expanded without sacrificing comparability. The existing evidence is concentrated in Bangladesh, Pakistan, India, Indonesia, Nepal, Nigeria, and a smaller number of other settings. Cross-country studies should harmonize definitions and account for regulatory regime, bank ownership, market structure, climate exposure, and financial depth. Otherwise, differences attributed to green banking may actually reflect national institutions or reporting practices.

Conclusion

The literature supports a qualified positive relationship between green banking and bank financial performance. Green banking can contribute to profitability and competitiveness when it is embedded in lending, investment, risk management, digital delivery, and operational improvement. Green finance appears to be a central transmission mechanism, while asset quality, implementation capacity, and time horizon condition the outcome.

The evidence does not support a universal or immediate profitability premium. Some studies find positive effects on ROA, ROE, ROI, market value, or broader performance; others find no short-term effect or a negative effect on ROE during transition. These findings are compatible with a staged process in which banks first incur implementation costs, then improve processes and environmental risk management, and only later realize financial benefits through efficiency, portfolio quality, reputation, or market positioning.

The strongest conclusion is therefore conditional: green banking is financially compatible and may be financially beneficial, but its value depends on credible implementation and the bank's ability to convert environmental practices into measurable financing, efficiency, and risk-management outcomes. Future research should move from broad adoption claims toward component-level, longitudinal, and causally identified evidence that can show when, where, and through which mechanism green banking improves bank performance.

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