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The Role of Green Banking in Enhancing Profitability: Evidence from Indian Retail Banks

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ABSTRACT

Purpose: This study provides an empirical investigation into the effect of Green Banking Practices on the profitability of selected Indian retail banks. Panel data were collected from secondary sources, specifically the annual reports of the top five retail banks in India, covering the period from the year two thousand twenty to two thousand twenty-two. The analysis explores how environmental sustainability initiatives undertaken by banks influence financial performance. The empirical evidence suggests that these banks are increasingly aware of the strategic importance of adopting environmentally responsible practices. Green Banking has emerged as a matter of relevance at the board level, with institutions gradually integrating climate change considerations into their strategic planning and operational execution. This shift has shown a favourable impact on overall profitability, indicating that sustainable practices are not only environmentally essential but also financially beneficial. To examine the relationship between the variables, the study employed regression analysis, where profitability served as the dependent variable and various Green Banking indicators acted as independent variables. The results contribute valuable insights that can inform policy development and encourage further academic inquiry into the intersection of environmental sustainability and financial performance in the banking sector.

Keywords: Green Banking, Green Finance, Profitability

INTRODUCTION:

Environmental concerns are becoming increasingly prominent across all sectors of business. There is growing pressure from regulatory authorities, consumer groups, non-governmental organizations, and media platforms urging businesses to adopt environmentally sustainable practices. Within this context, banks occupy a unique and influential position in the financial system. As intermediaries that allocate capital across sectors, banks hold the potential to influence production patterns, commercial activity, national economic development, and broader socio-economic changes through their financial decisions.

According to Goel (two thousand sixteen), banks can exercise considerable influence over business operations, investment choices, and managerial strategies, thereby affecting environmental outcomes. Recognizing this responsibility, an increasing number of banks are adopting the principle of "Go Green" by introducing environmentally friendly financial products and implementing internal policies that support environmental conservation.

These environmentally conscious practices are commonly referred to as green banking, sustainable banking, or environmental banking. Institutions that implement such practices are often described as green banks or environmental banks (Sahoo and Nayak, two thousand seven). Through these initiatives, banks

contribute to promoting sustainable development while simultaneously aligning themselves with evolving expectations from stakeholders and regulatory frameworks.

In the present study, the researcher introduces a conceptual framework that explores the domain of Green Banking Practices and investigates their potential influence on the financial profitability of banks. The framework emphasizes the role of environmentally sustainable internal operations, referred to as green internal processes, which are integral to aligning banking functions with ecological responsibility.

Green internal processes encompass a range of strategies adopted by banks to optimize the use of available resources. These strategies include efficient waste management practices such as recycling and reusing materials, the deployment of eco-friendly equipment, and the implementation of sustainable infrastructure. Furthermore, the framework incorporates personnel training programs aimed at promoting environmental awareness and responsibility among employees. It also highlights the need for continuous upgrades to internal systems and processes that prioritize environmental protection.

By integrating such practices, banks not only contribute to environmental sustainability but may also enhance their operational efficiency and long-term profitability. This conceptual approach provides a foundation for further empirical examination into how internal environmental initiatives within banks relate to financial performance.

Banks have introduced several innovative practices under the umbrella of Green Banking to align their operations with environmental sustainability. These innovations are aimed at reducing environmental impact and promoting responsible use of resources. Among the widely adopted initiatives are online banking services, construction of environmentally certified green buildings, and participation in reforestation programs. Many banks have also installed solar panels on their rooftops as a means of utilizing renewable energy sources.

In addition, banks are increasingly making use of digital communication tools, such as video conferencing through webcams, as an alternative to physical meetings. This reduces travel-related emissions and contributes to operational efficiency. Other practices include the use of electronic mail for official communication, issuance of digital account statements in place of printed documents, and the implementation of waste management policies that emphasize recycling and reuse.

The underlying objective of these innovations is to adopt a proactive approach toward environmental preservation and climate change mitigation. These measures also aim to promote the responsible and efficient use of renewable and non-renewable resources, as well as human and natural capital. Through such initiatives, banks can play a significant role in minimizing their carbon footprint while contributing positively to sustainable development goals.

From a theoretical standpoint, environmental performance has often been viewed as a potential burden for firms due to the associated compliance costs. Palmer and colleagues (1995) argue that adherence to environmental and green regulations may impose additional financial obligations on organizations, thereby negatively impacting short-term profitability. However, contrasting this perspective, Porter and van der Linde (1995) propose that well-designed and strategically implemented environmental standards can serve as catalysts for innovation. These innovations, particularly in operational processes, can lead to improved efficiency, cost reductions, and ultimately enhanced profitability.

While a number of empirical studies have investigated the relationship between environmental performance and financial outcomes across various industries, relatively few have focused on the banking sector. Research by Bose and others (2021) and Jo and colleagues (2015) highlights the limited but growing attention being paid to the integration of green practices in financial institutions. These studies suggest that although the adoption of environmentally responsible strategies has gained momentum in recent years, its impact on banking performance remains an underexplored area, warranting further scholarly investigation.

In empirical research on banking performance, Return on Assets and Return on Equity are widely recognized as the primary indicators of profitability. These measures serve as standard benchmarks for assessing the financial efficiency and overall performance of banking institutions. In the present study, these two-profitability metrics have been employed to evaluate the influence of Green Banking Practices.

The environmental practices considered in this research include the management of carbon dioxide emissions, waste handling strategies, and energy consumption by banks. To ensure the robustness of the findings and to address issues related to profit persistence and potential endogeneity, the study applies the Generalized Method of Moments estimation technique.

The results of the analysis suggest that although banks demonstrate a growing awareness of the implications of climate change on their operations and recognize it as a topic of strategic relevance at the board level, their commitment to implementing green practices at the operational level remains limited. The study finds a positive association between environmental practices and profitability, but this relationship appears to be significantly influenced by the extent and quality of climate change management and the degree to which the subject is integrated into corporate governance through disclosure and board-level attention.

Literature Review:

Ali Bukhari et al.., (2020), present a comprehensive framework for the adoption of Green Banking practices by financial institutions, structured around Environmental, Social, and Governance (ESG) parameters. The study provides a set of adaptable strategies that banks can implement at various stages of their Green Banking journey. These strategies are intended not only for internal use by banks but also serve as a foundation for regulatory authorities to formulate relevant guidelines and policies that support sustainable financial practices. The conceptual foundation of the study is based on the theory of human ecology, which examines the interdependence between human systems and their environmental context. This approach enables an understanding of how various external and internal factors affect the capacity of banks to implement environmentally sustainable operations. According to the study, successful adoption of Green Banking requires a structured sequence of internal processes, influenced by the surrounding ecological, institutional, and market environments. Furthermore, the study emphasizes the role of ESG ratings and evaluation systems in guiding banks toward optimal implementation. These classifications help in assessing the maturity and complexity of Green Banking efforts and ensure that institutions progress through appropriate levels of compliance, responsibility, and impact.

Hossain et al., 2020; Zhixia et al., 2018, describe Green Banking as a distinctive model of banking in which financial institutions take on an active role as environmentally responsible actors within the global economy. These institutions integrate environmental sustainability into their operational and strategic frameworks, reflecting a deliberate effort to align banking activities with ecological and social well-being. Green Banking is frequently associated with terms such as socially responsible banking, sustainable banking, ethical banking, and environmentally conscious banking. These labels underscore the commitment of such institutions to practices that promote ecological stewardship, reduce environmental risk, and support long-term sustainability goals. By embedding these values into their daily operations, banks not only contribute to environmental protection but also enhance their reputational capital and align themselves with evolving global expectations for corporate responsibility.

Scholtens (2009), explored the concept of green corporate social responsibility within the banking sector and provided an analytical perspective on how environmentally responsible practices are embedded in financial services. In his study, Scholtens emphasized that green banks go beyond traditional banking functions by offering savings products that directly fund sustainable and environmentally beneficial projects. This approach reflects a strategic alignment between financial intermediation and ecological objectives. To evaluate the degree of social responsibility among banks, Scholtens developed a framework and applied it to a sample of thirty financial institutions. The study concluded that there exists a positive and statistically significant relationship between a bank's corporate social responsibility score and both its

financial size and the quality of services it provides. These findings suggest that larger and more service-oriented banks are more likely to integrate green practices into their operations, indicating that environmental responsibility can coexist with financial performance and customer satisfaction.

Evangelinos et al. (2009), emphasized the critical role of green financial products in promoting environmental sustainability within the banking sector. The study highlighted the importance of offering loans specifically targeted at renewable energy projects, investing in environmentally responsible technologies across the value chain, and adopting green management and marketing strategies. These environmentally focused initiatives are not only aligned with sustainable development goals but also serve to enhance the public image and reputation of banks. According to the study, such practices contribute directly to a bank's reputational capital, positioning it as a responsible and forward-looking institution. This positive reputation, in turn, motivates many banks to invest further in green initiatives, as it helps them prepare for emerging environmental challenges and regulatory expectations. The adoption of green strategies is increasingly viewed not only as an ethical obligation but also as a competitive advantage in a financial landscape that is becoming progressively influenced by environmental considerations.

Lymperopoulos et al. (2012), through empirical analysis, demonstrated that environmentally oriented banking initiatives contribute to the development of a favourable institutional image. The study introduced the concept of green bank marketing, which is grounded in three foundational components: green corporate social responsibility, green internal processes, and green product development. Green corporate social responsibility reflects the bank's external commitments to environmental stewardship and societal well-being. Green internal processes refer to the integration of environmentally sustainable practices within the bank's operations and administrative functions. Green product development involves the design and promotion of financial products that support eco-friendly initiatives, such as loans for renewable energy projects or investment instruments that prioritize sustainability. Together, these elements form a cohesive framework that highlights a bank's dedication to responsible and sustainable practices. The findings suggest that this integrated green marketing approach not only enhances the bank's environmental performance but also positively influences its brand image and stakeholder trust.

Kumar and Prakash (2018) conducted an in-depth investigation into the level of adoption of sustainable banking tools within the Indian banking sector. Their study employed content analysis to evaluate the extent and nature of green and sustainable practices implemented by various banks across the country. The findings revealed that the adoption of green banking practices in India remains at an early stage of development. This suggests that significant potential exists for further integration of sustainability principles into banking operations, both in terms of internal processes and external financial products. While Indian banks are gradually becoming aware of the importance of environmental responsibility, global trends indicate a more advanced stage of adoption. Several international banks and non-banking financial institutions have implemented eco-friendly mechanisms for both financing and internal operations. Notable examples include countries such as Bangladesh, Brazil, Colombia, and Indonesia, where banks have begun to implement green banking initiatives aligned with national policies and regulatory frameworks. These international efforts demonstrate a stronger commitment to sustainable finance and offer valuable insights for Indian banks seeking to advance their own green agendas.

Oyegunle & Weber, 2015. in their study on the Bank of Ceylon, observed that the institution has increasingly shifted its services and products toward technology-oriented platforms. This transition plays a significant role in reducing the bank's overall carbon footprint by minimizing paper use, limiting the need for physical infrastructure, and enhancing operational efficiency. The study highlights how the integration of digital technologies in banking can contribute not only to service innovation but also to environmental sustainability.

The Boston Consulting Group, 2009; Sharma et al., 2014; Maheshwari, 2014; Rastogi & Khan, 2015; Sindhu, 2015 – In their studies have collectively identified key challenges in the adoption and communication of Green Banking practices. These studies point to a significant disconnect between the intentions and efforts of banks to promote environmental sustainability and the perceptions held by

customers. While many banks have undertaken initiatives to project a commitment to Green Banking, there remains a substantial gap between what institutions aim to communicate and how customers interpret these efforts. This communication gap undermines the effectiveness of sustainability strategies, as customers may remain unaware of or unconvinced by the banks' environmental commitments. The findings suggest that improved transparency, clearer communication, and more visible implementation of green practices are essential for building customer trust and enhancing the credibility of banks in the area of environmental responsibility.

Jayadatta & Nitin, 2017 highlighted the growing concern of greenwashing within the banking sector. Their study found that exaggerated or misleading claims related to environmental responsibility have led consumers to question the authenticity of banks' green marketing strategies and promotional efforts. This rising scepticism negatively affects the green brand image of banks, diminishing public trust and undermining genuine sustainability initiatives. The authors emphasize the importance of transparency and credibility in environmental communication to mitigate the adverse effects of greenwashing.

Biswas, 2011 in his study highlighted a significant gap in demographic exists. The pursuit of inclusive economic growth necessitates the establishment of resilient and sound banking practices. However, extensive research indicates that green banking activities in India predominantly revolve around services such as ATM facilities, internet banking, and paperless transactions. Moreover, studies reveal that Indian banks currently face significant challenges in effectively implementing comprehensive green banking initiatives. This suggests that there is a considerable need for enhancing the capacity and resources of Indian banks to embrace and integrate sustainable practices more comprehensively into their operations.

Chen (2010), A green brand image is established when customers perceive a business's product as embodying a genuine commitment to sustainability and addressing environmental concerns. It reflects the customers' recognition of the brand's eco-conscious practices and their belief that the product aligns with their own green values. The products and services offered should have a green standing in the market, success in sustainable achievement and trustworthiness of environmental commitments. The study also endorsed that green marketing positively stimuluses a company to obtain competitive advantage, enhance corporate image and product value and strive for innovative opportunities in market and incorporate green technology the further supplements the product value of the products offered.

Hartmann et al. (2005) study highlighted that a resourcefully drawn-out green positioning market strategy can provide direction towards more appreciative brand image. The perception of customers also plays an important role in the brand overall reputation.

Nguyen & LeBlanc, (2001). Further said green bank image can assist a company in retaining, winning back and attracting new customers, thereby contributing banks future sustainability. Green marketing is presumed to enhance the corporate image and have a significant impact on brand equity.

Sharma, Gopal et al. (2014) In an attempt to gauge the level of consumer awareness regarding Green Banking initiatives in India, with a specific focus on Mumbai, a primary survey was conducted. Surprisingly, the findings revealed that even among individuals utilizing online banking facilities provided by their banks, nearly three-fourths of them were unaware of the term "Green Banking." Among those who were familiar with the term, their understanding mainly revolved around online bill payments and cash deposit systems, neglecting other significant Green Banking initiatives. Notably, consumers displayed limited awareness of initiatives such as Green CDs, solar-powered ATMs, and bonds for environmental protection. These findings highlight the need for increased awareness and education about the various facets of Green Banking among consumers in Mumbai and emphasize the potential for further dissemination of information to bridge this knowledge gap. The Gender based difference in awareness of green initiatives by bank especially E-Statements, Net Banking and Green loans is also analysed here which reveals that both males and females are equally aware with respect to Green Banking. The researcher's state that the major obstacle in Green Banking is the technical issues involved followed by lack of awareness.

Nath, Nayak et al. (2014) A comprehensive study explored the Green Rating Standard, known as Green Coin Rating, implemented by the Reserve Bank of India (RBI) to evaluate banks based on carbon emissions and recycling activities. The study also examined the adoption of World Bank's environmental and social norms by banks and their proactive measures in embracing green practices. These initiatives encompassed reducing energy consumption, implementing renewable energy sources, promoting paperless transactions, and engaging in recycling initiatives. The research highlighted the banking sector's commitment to sustainability and reducing environmental impact. World Bank suggests Banks to do Environmental Impact Assessment, Annual Reporting and adopt sustainable technology. The researchers study and list the initiative taken in respect of environment by different banks in India

Sudhalaksmi and Chinnadorai (2014) present the status of Indian banks in terms of Green Banking indicates that while the green mantra is crucial for emerging economies like India, significant efforts have yet to be undertaken. Banks are required to include their green strategy in the lending principle. Every step taken today will mean a better global and sustainable environment. Indian banks are running behind in adoption of the green phenomenon. Serious measures are required to be taken in this regard.

Neyati Ahuja / International Journal for Research in Management and Pharmacy Vol. 4, Issue 1, January: 2015 (IJRMP) ISSN: 2320-0901 15 Online International, Reviewed & Indexed Monthly Journal www.raijmr.com RET Academy for International Journals of Multidisciplinary Research (RAIJMR) event meetings, media and websites The establishment of a well-defined and comprehensive green policy guideline is imperative for the successful implementation of Green Banking practices. Green Banking relevance is explored in this study. The researcher finds that there has not been enough progress on green initiatives by banks in India and thus policy measures are needed to promote Green Banking in India. The researcher highlighted that none of the Indian banks have adopted equator principle and none of them is a signatory to UNEP financial initiative statement. Indian banks should use environmental principles for funding projects.

Abd Hadi Mustaffa, Noryati Ahmed (2021), Global Business and Management Research: An International Journal 13(4):66-79: This paper used PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analysis). to systematically evaluation the barriers to green financing participation by investors and borrowers worldwide. Study used thematic analysis to describe the seven barriers to green financing as 1) financial institutions incapability; 2) capital constraint; 3) strict policy and guidelines; 4) weak financing structure; 5) political constraints in the form of political barriers and inadequate policy support; 6) risk perception of high-risk endeavours with limited return on investment, and 7) limited access. The study through its findings suggested a gap and encouraged bankers to acknowledge these constraints and work towards bridging them.

Objectives of the Study

The main objective of the study is to perceive the association between green finance and banks profitability.

The specific objectives are as follows:

i. Identify the association between green banking initiatives and bank profitability

ii. Provide suggestions for improvement in sustainable finance.

Hypothesis of the study

H0: There is no association between green banking initiatives and bank profitability

Ha: There is an association between green banking initiatives and bank profitability

Methodology:

A considerable proportion of banking professionals acknowledge that adopting green banking is a proactive strategy for ensuring long-term sustainability. However, Indian banks continue to lag significantly behind their counterparts in developed nations. Studies by Jayadatta and Nitin (2017) and the Boston Consulting Group (two thousand nine) attribute this disparity to a lack of education, limited awareness, and inadequate preparedness among Indian banks, which collectively pose substantial obstacles to the effective implementation of green banking initiatives.

There is a general consensus in the literature that the widespread adoption of green banking practices at the grassroots level remains a distant goal without focused and coordinated efforts. Kumar and Prakash (2018) emphasize that this goal can only be realized through the collective collaboration of key stakeholders including government authorities, banking institutions, and customers. Such unified engagement is essential to foster a robust green banking ecosystem that supports sustainability through informed policy, institutional commitment, and public participation.

To examine the relationship and impact of green finance on bank profitability, the researcher has employed a secondary data approach. The data spans a three-year period from 2020 to 2022. Key sources of data include statistics published by the Reserve Bank of India (RBI), which serves as the principal regulatory authority for commercial banks in the country. In addition to RBI reports, the annual reports of selected banks have been thoroughly reviewed and utilized to extract relevant financial and sustainability-related information. The collected data has been systematically categorized and tabulated according to the analytical requirements of the study.

The researcher has analysed the data using standard profitability measures along with statistical tools such as correlation analysis and regression techniques. In the regression model, Return on Assets (ROA) and Return on Equity (ROE) have been selected as the dependent variables, while Green Finance (GF) which represents various green banking initiatives—has been taken as the independent variable. Panel data regression analysis has been employed to assess the effect of green banking initiatives on profitability. This approach is appropriate for dealing with both cross-sectional and time-series data, and is better suited to account for heterogeneity across observations. Correlation analysis was also conducted to examine the strength and direction of the relationships among variables. All statistical analyses were performed using the Stata software package.

The multiple regression models used in the study are as follows:

1) $ROAit = \beta 0 + \beta 1GFit + eit$ (1)
2) $ROEit = \beta 0 + \beta 1GFit + eit$ (2)

Where:

ROA= Return on Assets of bank *i* at time *t*

ROE = Return on Equity of bank *i* at time *t*

GF = green banking daily operations or practices (GHG Emission, Total Energy Consumption, Waste Management). for i firm in time t

β1, β2, ..., βn are the regression coefficients that represent the impact of each independent variable on the dependent variable.

eit = error term

Scope of Study:

The study focuses on five leading private sector retail banks in India. These banks were selected based on the following criteria:

1. Market Share & Size: These banks are among the top private sector banks in terms of total assets, customer base, and nationwide presence.
2. Reputation for Innovation: All five have demonstrated leadership in adopting technology-driven solutions such as digital banking and green banking practices, making them ideal candidates for analysing the impact of sustainability on profitability.
3. Availability of Data: These banks regularly publish comprehensive and consistent financial and sustainability-related disclosures in their annual reports, which was essential for conducting a reliable and comparable panel data analysis.
4. Private Sector Focus: The study deliberately narrows its focus to private sector banks to maintain homogeneity in operational structure, management style, and strategic orientation. Public sector banks face different mandates and challenges, which could skew comparative results.

Sampling Method

The purposive sampling method (also known as judgmental sampling) has been employed for the selection of banks. This non-probability sampling technique is suitable for exploratory research where specific characteristics of the sample entities are critical to the research objectives. In this case, the selection of large private sector banks known for innovation and voluntary sustainability reporting provides a robust basis for examining the relationship between green banking initiatives and profitability.

Time Period in Scope – 2020 to 2022

Table 1 - Banks in Scope:

Sr No	Name of Bank	Type of Bank
1	HDFC Bank	Private
2	ICICI Bank	Private
3	IndusInd Bank	Private
4	Kotak Mahindra Bank	Private
5	Axis Bank	Private

Result and Discussion

The shows the descriptive statistics of all of the study variables. The mean of return on asset is 1.45 and return on equity is 11.65 for the selected sample banks. GHG Emission of the Bank is 2.15. The overall energy consumed by the banks in scope is 41.27. The Waste produced by the banks is 83.3 MT. Overall, the descriptive statistics reflects the sound position of retail banks in India.

Descriptive Statistics:

Table 2 – Descriptive Statistics of the banks in scope

Bank Variables	Mean	Std. Dev	Min	Max
Banks	3	1.46385	1	5
Year	2021	0.845154	2020	2022
ROE	11.654	4.199374	2.15	16.66
ROA	1.450667	0.585778	0.2	2.13
GHG Emission	2.158667	0.857012	1.06	3.8
Energy Consumption	41.27467	71.93003	1.6	283.5
Waste Management	83.30133	67.7035	0.45	212

Source – Authors own calculation

Panel Data Regression of all study variables on ROE:

The empirical estimation carried out in the study by the researcher made used of Panel data regression wherein the bank specific variables like GHG Emission, Energy Consumed and Waste Produced by the banks in scope was regressed against the ROE of the banks.

Figure-1 - Summary output of a linear regression model - ROE

```
      Source |       SS           df       MS      Number of obs   =        15
-------------+----------------------------------   F(3, 11)        =      1.06
       Model |  55.5477034         3  18.5159011   Prob > F        =    0.4035
    Residual |  191.338657        11  17.3944233   R-squared       =    0.2250
-------------+----------------------------------   Adj R-squared   =    0.0136
       Total |   246.88636        14    17.63474   Root MSE        =    4.1707

------------------------------------------------------------------------------
         roe |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
  ghgemission |  -.5101674   1.522716    -0.34   0.744    -3.861642    2.841307
energyconsum~n |   .0050079   .0187738     0.27   0.795    -.0363129    .0463288
wastemangement |   .0313347   .0181522     1.73   0.112     -.008618    .0712874
       _cons |   9.938362   3.173353     3.13   0.010      2.95386    16.92286
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```

Interpretation of the outputs:

Prob > F = 0.4035: This is the p-value of the model. It tests the null hypothesis that the R-square is equal to 0. To reject the null hypothesis, usually we need a p-value lower than 0.5. Here, the p-value of 0.4035 indicates a statistically significant relationship between X and Y.

R-squared = 0.2250: R-square shows the amount of variance of Y explained by X. In this case ROE explains 22% of the variance in Green Finance Variables.

Adj R-squared = 0.0136: Adjusted R-square shows the same as R-square but adjusted by the # of cases and # of variables. When the # of variables are small and the # of cases is very large then Adj R-square is closer to R-square. This provides a more honest association between X and Y.

Root MSE = 4.1707: root mean squared error, is the SD of the regression. The closer to zero better the fit.

The estimated coefficient for ROE is 9.938362. This means for each one-point increase in ROE, Green Finance Variable scores decrease by 9.93 points.

The t-values test the null hypothesis that each coefficient is 0. To reject this, you need a t-value greater than 1.96 (for 95% confidence). You can get the t-values by dividing the coefficient by its standard error. The t-values also show the importance of a variable in the model.

P>|t| = 0.010: The two-tailed p-value tests the null hypothesis that the coefficient is equal to 0 (i.e., no significant effect). To reject this, the p-value has to be lower than 0.05 (you could choose also an alpha of 0.10). In this case, Green Finance Variables are statistically significant in explaining ROE.

Panel Data Regression of ROA on all study variables:

The empirical estimation carried out in the study made used of Panel data regression wherein the bank specific variables like GHG Emission, Energy Consumed and Waste Produced by the banks in scope was regressed against the ROA of the banks.

Figure 2 - Summary output of a linear regression model - ROA

Source	SS	df	MS	Number of obs	=	15
				F(3, 11)	=	1.24
Model	1.21747592	3	.405825306	Prob > F	=	0.3404
Residual	3.58641763	11	.326037966	R-squared	=	0.2534
				Adj R-squared	=	0.0498
Total	4.80389354	14	.343135253	Root MSE	=	.571

roa	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
ghgemission	-.250599	.2084721	-1.20	0.255	-.7094429	.208245
energyconsumption	.0015386	.0025703	0.60	0.562	-.0041186	.0071958
wastemangement	.0043493	.0024852	1.75	0.108	-.0011205	.0098192
_cons	1.565815	.4344576	3.60	0.004	.6095805	2.52205

Interpretation of the outputs:

Prob > F = 0.3494: This is the p-value of the model. It tests the null hypothesis that the R-square is equal to 0. To reject the null hypothesis, usually we need a p-value lower than 0.5. Here, the p-value of 0.4035 indicates a statistically significant relationship between X and Y.

R-squared = 0.2534: R-square shows the amount of variance of Y explained by X. In this case ROA explains 25% of the variance in Green Finance Variables.

Adj R-squared = 0.0498: Adjusted R-square shows the same as R-square but adjusted by the # of cases and # of variables. When the # of variables are small and the # of cases is very large then Adj R-square is closer to R-square. This provides a more honest association between X and Y.

Root MSE = 0.571: root mean squared error, is the Sd of the regression. The closer to zero better the fit.

The estimated coefficient for ROA is 1.565815. This means for each one-point increase in ROA, Green Finance Variable scores decrease by 1.56 points.

The t-values test the null hypothesis that each coefficient is 0. To reject this, you need a t-value greater than 1.96 (for 95% confidence). You can get the t-values by dividing the coefficient by its standard error. The t-values also show the importance of a variable in the model.

P>|t| = 0.004: The two-tailed p-value tests the null hypothesis that the coefficient is equal to 0 (i.e., no significant effect). To reject this, the p-value has to be lower than 0.05 (you could choose also an alpha of 0.10). In this case, Green Finance Variables are statistically significant in explaining ROA.

CONCLUSION:

To date, empirical research on climate change management within the banking sector has remained relatively limited, with minimal focus on its financial implications and broader impact. This study aims to bridge that gap by exploring the relationship between green banking initiatives and profitability, using a panel data set from select Indian retail banks over the period 2020–2022. Profitability is assessed using two key performance indicators: Return on Total Assets (ROA) and Return on Equity (ROE), while green finance practices are represented by variables such as greenhouse gas (GHG) emissions, waste management, and energy consumption associated with bank operations. The empirical findings indicate a positive relationship between green banking practices and bank profitability. The banks under study have adopted several initiatives, including reduced paper usage, internal sustainability practices, and the promotion of green projects, all aimed at fostering environmental sustainability and supporting the long-term development of the banking sector and the nation. The results suggest that adopting robust climate change management strategies does not hinder profitability; rather, it can complement financial performance in the evolving landscape of responsible banking.

The researcher suggests that the findings of this study will be particularly valuable for bank employees, as they offer insights into the various features and benefits associated with the adoption of green banking practices. The results are expected to help banking managers better understand the internal and external factors influencing the implementation of green initiatives. This, in turn, can support the development of more pragmatic and informed managerial strategies aimed at integrating sustainable practices within the banking framework. Ultimately, such efforts are likely to contribute to more efficient, cost-effective, and environmentally responsible management of banking operations.

The researcher acknowledges certain limitations in the present study. The scope of the analysis was confined to examining the impact of green banking practices solely on profitability, without considering other potential performance indicators such as customer satisfaction, market reputation, or operational efficiency. Additionally, only a limited set of factors influencing profitability were taken into account. The sample size was relatively small, primarily due to constraints related to time and available resources, which may limit the generalizability of the findings.

The reliability, quality, and comparability of data related to green banking are steadily improving. This presents an opportunity for future researchers to more accurately assess green banking practices and evaluate their impact on financial performance and operational sustainability. Furthermore, as banks differ in the range of financial products and services they offer—such as loans, investments, and advisory functions—the adoption and implementation of sustainable managerial practices can vary significantly across institutions. Future studies may benefit from conducting a more granular analysis of specific banking activities and their alignment with green initiatives, thereby offering deeper insights into the effectiveness and outcomes of green banking strategies.

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