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Environment Sustainability and Banks: A Study of Selected Indian Banks

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Abstract *Environmental sustainability has become a critical focus in corporate strategy, especially among financial institutions. Banks are progressively adopting ESG principles within their operational frameworks. The concept of environmental sustainability emphasizes responsible environmental practices aimed at preserving natural resources and ensuring their availability for future generations without compromising quality.*

Purpose: COVID-19 pandemic has drastically altered human behavior and perceptions, particularly concerning the environment. This study investigates the impact of environmental disclosures on the performance of selected Indian banks.

Methodology: The study utilizes a dataset comprising financial and environmental metrics for selected Indian banks during the period 2013-2021. Using spearman's Rank Correlation and robust regression analysis, the study examines the impact of environmental disclosure index on key financial indicators.

Findings: The study reveals that banks with higher environmental disclosure index (EDI) tend to have high interest income per employee and better financial health in terms of lower non-performing advances. However, the relationship between environmental disclosure index and capital adequacy was nuanced, indicating potential costs associated with higher environmental disclosures. The significant relationships between environmental disclosures and bank performance, providing insights for stakeholders on the importance of sustainable practices in the Indian banking sector.

Keywords *Environmental Disclosures, Indian Banks, Financial Performance, ESG, Sustainability*

INTRODUCTION

The business sector has recently come to view environmental sustainability as a major concern. As major players in the financial sector, banks are gradually integrating Environmental, Social, and Governance (ESG) considerations into their strategy frameworks. Environmental sustainability pertains to the careful engagement with natural ecosystems to prevent the exhaustion or deterioration of resources, thereby ensuring their availability and quality for future generations. It encompasses several key areas; resource management, which involves the sustainable use of natural resources, pollution control, aimed at reducing emissions of pollutants into the air, water, and soil; biodiversity conservation, which focuses on protecting species and habitats to maintain ecological balance; climate change mitigation, aimed at reducing greenhouse gas emissions to counteract climate change; sustainable agriculture, which involves practices that maintain soil health and waste management; and reduce the use of harmful chemicals, which emphasizes the effective management of waste through reduce, recycle, and reuse.

In India, banks play a crucial role in promoting environmental sustainability. By offering financial services that assist ecologically friendly initiatives, They engage in green financing, providing financial products and services that support environmentally sustainable projects, such as loans for renewable energy projects, green bonds, and funds for sustainable infrastructure. Banks also encourage sustainable investments by developing green investment funds or ESG-focused portfolios, and they integrate environmental risk assessments into their credit evaluation processes to ensure that the projects they finance do not harm the environment. Additionally, banks promote green practices among their clients and stakeholders through awareness programs, incentives, and sustainability-linked loans. They adopt eco-friendly practices within their operations, such as enhancing energy efficiency, reducing paper usage, and managing waste effectively. Banks also collaborate with governments and regulatory bodies to develop and implement policies that promote environmental sustainability, and they engage in corporate social responsibility (CSR) activities focused on environmental sustainability, such as tree plantation drives, conservation projects, and supporting research and innovation in green technologies.

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Examples of Indian banks leading in environmental sustainability include the State Bank of India (SBI), which has launched green bonds and provides financing for renewable energy projects and has adopted various eco-friendly practices within its operations. YES Bank, a pioneer in green banking in India, has issued green bonds and supports various sustainable development projects. ICICI Bank provides funding for sustainable projects and incorporates environmental risk assessments into its lending process, while HDFC Bank engages in various CSR activities focused on environmental conservation and supports renewable energy projects. These efforts by banks in India contribute significantly to the country's overall sustainability goals, helping to mitigate environmental impacts and promote sustainable development. This study focuses on the environmental aspect of ESG, examining its impact on the performance of selected Indian banks.

LITERATURE REVIEW

The relationship between environmental challenges and financial performance (FP) remains a subject of active debate among scholars (Elsayed & Paton, 2005a). Among the most critical environmental concerns is climate change, including global warming, which not only poses risks to the future performance of firms but also threatens the broader stability of the planet.

The existing literature investigates the impact of environmental issues from diverse perspectives. (Al-Tuwaijri et al., 2003), for instance, assessed the effects of environmental concerns such as hazardous waste and the recycling of toxic materials. Similarly, Wagner and Schaltegger (2004) examined how corporate environmental strategies influence the relationship between environmental performance and economic outcomes in European industrial firms. Their study concluded that companies adopting shareholder value-driven strategies demonstrate a stronger positive correlation between environmental and economic performance compared to those without such strategies.

Another research area explores the relationship between environmental regulations and disclosures and financial performance (FP), yielding conflicting results. Porter and Van Der Linde (1995) argue that stringent environmental regulations can enhance long-term revenue by reducing production costs and increasing customer satisfaction and sales, suggesting a "win-win" scenario for both firms and society. Studies have shown that stricter environmental regulations can foster competition, efficiency, and innovation, leading to improved profitability. (Hart, 1995; Karagozoglu & Lindell, 2000; Majumdar & Marcus, 2001) also noted that environmental regulations could drive productivity increases, serving as a defensive mechanism against international competition (Cairncross, 1994). Similarly, Dowell et al. (2000) found a positive relationship between stringent environmental disclosure commitments and FP, aligning with Saleh et al. (2010) who observed a positive correlation between environmental performance (EVN) and FP.

Several studies support the win-win argument, indicating a positive association between firms' financial performance and environmental performance (Murray et al., 2006). However, Chiong (2010) provided evidence of a negative relationship between environmental disclosure levels and FP measured by return on equity (ROE), revenue growth, and debt to equity ratios. This is consistent with (Smith et al., 2007) who found a negative relationship between EVN and FP, particularly evident in the association between EVN levels and return on assets (ROA) .

Other studies suggest that the relationship between environmental regulations, disclosure, and FP is minimal. (Elsayed & Paton, 2005b) measured FP using ROA, return on sales, and Tobin's Q, finding weak evidence that environmental disclosure and regulations significantly impact FP. Furthermore, some research indicates a neutral relationship between FP and environmental disclosures, suggesting that such disclosures may not be directly connected to profitability (Cowen et al., 1987; Sarumpaet et al., 2017).

In summary, the literature presents mixed findings on the impact of environmental disclosure and regulations on financial performance, highlighting the need for further research to clarify these relationships across different contexts and industries. To get the crux of current state of the existing literature related to the relationship between environment disclosures and firm performance, we include the important studies in the Table 1.

Table 1: Existing Literature on Environment Disclosures and Performance

Analysed Dimensions	Existing Literature	Effects on Performance
Environment Disclosure and Firm Performance	Elsayed & Paton, 2005c	Neutral
Eco-certification of buildings and Revenue	Chang & Devine, 2019	Negative
Environment Cost and Financial Performance	Jo et al., 2015	Negative
Environment Disclosure and Banks' ROE and ROA	Shakil et al., 2019	Positive
Environment Disclosures and Productivity	Majumdar & Marcus, 2001b	Positive

STUDY APPROACH

Study Sample

The study utilizes a dataset comprising financial and environmental metrics for selected Indian banks during the period 2013-2021. Ten major Indian banks were selected in this study The financial data used in the study were collected from ProwessIQ and Environment Scores were collected from Thomson Reuter's.

Overview of Environment Scores

In recent years, the ESG rating market has expanded considerably and is now widely employed by leading business consulting firms across the globe. Bassen and Kovács (2008) highlighted the importance of ESG scores in providing essential information for investors and other stakeholders to assess a corporation's risks and opportunities. These scores serve as key indicators to identify environmental (EVN), corporate social responsibility (CSR), and corporate governance (CG) practices. Han et al. (2016a) also noted that indicators of environmental activity, social responsibility, and governance mechanisms are vital for businesses and stakeholders.

This study utilizes the Environmental Disclosure Index (EDI) from Thomson Reuters, a source known for its accurate data collection. The Environmental Disclosure Index specifically addresses a range of environmental issues, including CO_2 emissions, energy consumption, energy efficiency policies, and total waste and emissions reduction policies, highlighting the organization's impact on the environment and its relationship with society.

Study Variables

The study assessed banks' performance across three dimensions: productivity, risk appetite, and efficiency, using IIPE (Interest Income Per Employee), CAR (Capital Adequacy Ratio), NNPA (Net Non-Performing Advances). These variables are selected after indepth literature review.

Table 2: Description of Dependent Variables

Sr. No.	Variables	Description	Literature Review
1	IIPE	IIPE is a company's net interest income divided by the number of employees.	Inam, H., & Mukhtar, A. (2014) (Lee & Isa, 2015)
2	CAR	The Capital Adequacy Ratio (CAR) is a financial metric that measures a bank's capital in relation to its risk-weighted assets and current liabilities..	(Bawa et al., 2019; Mandagie, 2021)
3	NNPA	NNPA is the ratio of Net Non Performing Advance to total advances.	(Bawa et al., 2019)

These dimensions served as dependent variables to identify the optimal regression model for evaluating the relationship between the study variables. Additionally, firm size was incorporated as a control variable. The inclusion of control variables is supported by prior research highlighting their significance in assessing the impact of ESG scores on financial performance (Alareeni & Hamdan, 2020; Hamdan, 2018; Han et al., 2016b; Margolis et al., 2007).

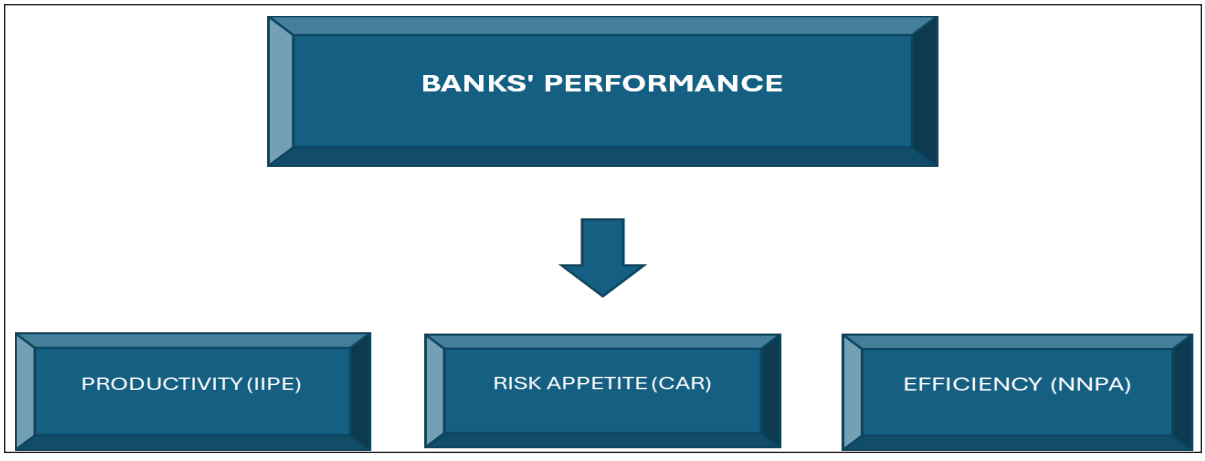


Fig. 1: Dimensions of Banks' Performance

Study Models

To measure EDI impact on Banks' Performance, the study estimates econometric models as follows:

$$Perf_{it} = \beta 0 + \beta 1\ EDI_{it} + \beta 2 FS_{it} + \epsilon_{it}$$

The study model variables are depicted in Table 3.

Table 3: Description of the Study Variables

Variable	Definition	Description
Perf	Banks' Performance	Measured by IIPE,CAR, Net Non Performing Advance(NNPA)
Env *Disclosure Index*	Environment Disclosures	The ENV Disclosure Index measures the disclosure of natural resource conservation, waste, pollution, and energy consumption etc. of the bank (i) in the period (t)
FS	Log of Firm Size	Measured by natural log of total assets of the bank (i), in the period (t)

Source: Prowess IQ and Thomson Reuters.

DATA ANALYSIS AND RESULTS

Descriptive Statistics

As shown in the Table 4, the data is not normally distributed. Skewness and kurtosis values indicate deviations from a normal distribution for most variables. Specifically, the skewness is not around 0, and the kurtosis is not around 3 for all variables. The Shapiro-Wilk normality tests indicated that the data was not normally distributed. Despite applying the natural logarithm transformation, the data remained non-normal. Consequently, we used Spearman's Rank Correlation for non-parametric analysis and robust regression to handle outliers and non-normality effectively.

Table 4: Descriptive Analysis and Normality Test

	Descriptive Statistics				Normality Test		
	Mean	**SD**	**Max**	**Min**	**Skewness**	**Kurtosis**	**Shapiro Wilk**
Independent Variable							
EDI	50.34	15.35	90.10	7.82	-0.118	0.923	0.113
Dependent Variable							
IIPE	7.87	1.78	14.00	4.00	0.246	0.983	0.004
CAR	15.11	3.31	33.70	8.50	2.212	11.604	0.000
NNPA	3.61	4.67	23.50	0.10	2.594	7.075	0.000
Control Variables							
Firm Size (Log))	15.57	0.87	17.63	13.68	-0.024	0.136	0.082

Spearman's Rank Correlation

Given the non-normal distribution of several variables, as confirmed by the Shapiro-Wilk test, Spearman's rank correlation was selected for this analysis. This non-parametric method is robust to violations of normality and linearity, allowing for a reliable assessment of the monotonic relationship between variables. Unlike Pearson's correlation, which requires normally distributed and linearly related data, Spearman's rank correlation evaluates the strength and direction of the relationship based on the ranks of the variables, making it well-suited for our dataset.

The Spearman's rank correlation analysis identified significant correlation between the variables: Environment Disclosure Index (EDI), Interest Income Per Employee (IIPE), Capital Adequacy Ratio (CAR), Net Non-Performing Advances (NNPA), and Firm Size.

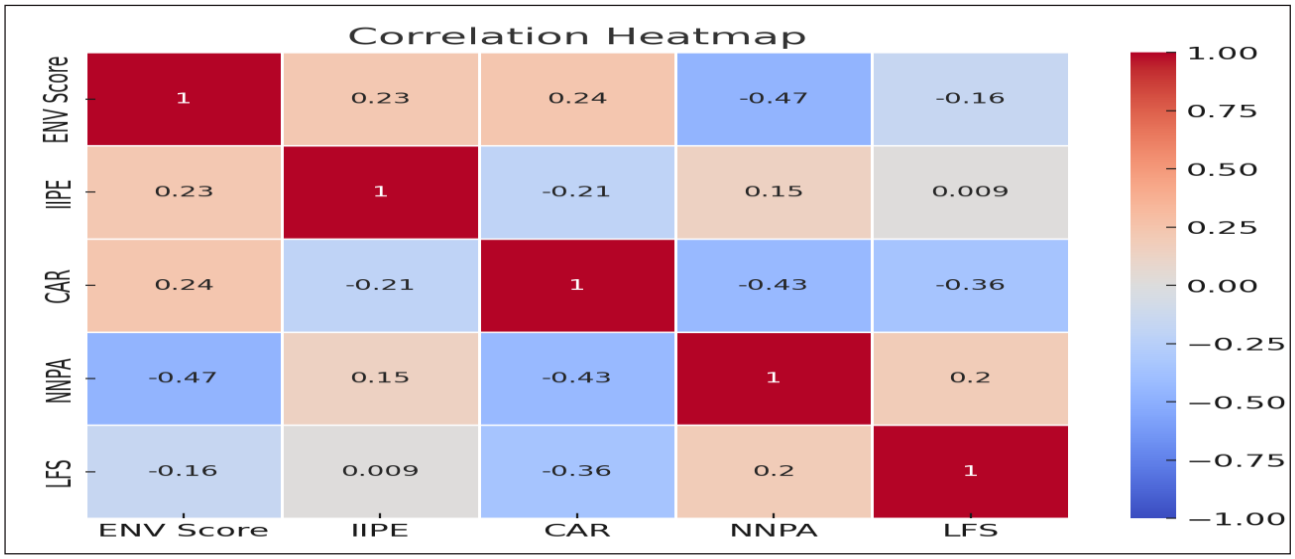
Firstly, a positive correlation was observed between Environmental Disclosure Index and IIPE, indicating that higher environmental scores are associated with higher interest income per employee. This suggests that firms with better environmental disclosures tend to perform better in terms of generating interest income relative to their employees. Similarly, a positive correlation between

EDI and CAR was observed, implying that firms with higher environmental scores also tend to have better capital adequacy ratios, reflecting stronger financial health and stability.

On the other hand, a significant negative correlation was identified between EDI and Net Non-Performing Advances. This relationship indicates that firms with higher environmental scores tend to have lower levels of non-performing advances, which signifies better asset quality and risk management practices. Additionally EDI and firm size showed a negative correlation, suggesting that larger firms tend to have lower environmental scores. This could imply that bigger firms might face more challenges in maintaining high environmental performance or transparency.

Table 5: Rank Correlation Analysis

Variable	EDI	IIPE	CAR	NNPA	Firm Size
EDI	1.000	0.226	0.240	-0.474	-0.158
IIPE	0.226	1.000	-0.207	0.146	0.009
CAR	0.240	-0.207	1.000	-0.430	-0.359
NNPA	-0.474	0.146	-0.430	1.000	0.195
Firm Size	-0.158	0.009	-0.359	0.195	1.000



Robust Regression Analysis

The selection of robust regression over traditional ordinary least squares (OLS) regression was driven by several factors. Firstly, robust regression is less sensitive to outliers and deviations from assumptions such as homoscedasticity and normality, which were issues identified in our dataset through normality tests. Given the presence of non-normally distributed variables and potential outliers, robust regression provides more reliable and stable estimates, reducing the influence of anomalous data points. This makes it particularly appropriate for financial data, where outliers and heteroscedasticity are common.

The robust regression analysis revealed significant relationships between EDI and the financial performance indicators, controlling for Firm Size(log).

Model 1: Impact of EDI on Banks' Productivity

$$IIPE_{it} = \beta 0 + \beta 1\ EDI_{it} + \beta 2 FS_{it} + \epsilon_{it}$$

This model examined the impact of EDI on IIPE, controlling for Firm Size. The results showed that EDI has a significant positive impact on IIPE. The findings revealed a significant positive association between these two variables, suggesting that firms with higher environmental scores tend to generate more interest income relative to their workforce. However, Firm Size was found to be an insignificant predictor in this model, indicating that the size of the firm does not substantially impact the relationship between the EDI and IIPE.

Model 2: Impact of of EDI on Banks' Risk Appetite

$$CAR_{it} = \beta 0 + \beta 1\ EDI_{it} + \beta 2 FS_{it} + \epsilon_{it}$$

This model examined the impact of EDI on CAR was assessed, again controlling for Firm Size. The results indicated that EDI has a significant negative impact on CAR. This suggests that higher environmental scores are associated with lower capital adequacy ratios, potentially reflecting higher costs or investments in sustainability initiatives that might reduce the available capital buffer. Firm Size also showed a significant negative effect on CAR, indicating that larger firms tend to have lower capital adequacy ratios.

Model 3: Impact of of EDI on Banks' Efficiency

$NNPA_{it} = \beta 0 + \beta 1\ EDI_{it} + \beta 2 FS_{it} + \epsilon_{it}$

The third model examined the relationship between the EDI and Net Non-Performing Advances, controlling for Firm Size. The results demonstrated a significant negative association between these variables, suggesting that firms with higher environmental scores tend to have lower levels of non-performing advances. This indicates better asset quality and risk management practices associated with strong environmental performance. Firm Size was found to be an insignificant predictor in this model, implying that the size of the firm does not substantially impact the relationship between the EDI and Net Non-Performing Advances.

Table 6: Robust Regression Analysis

	IIPE			CAR			NNPA		
	Intercept	**EDI**	**Firm Size**	**Intercept**	**EDI**	**Firm Size**	**Intercept**	**EDI**	**Firm Size**
Estimate	3.922748	0.025652	0.172389	30.03561	0.019919	-1.037556	0.734940	-0.060190	0.301042
Std. Error	3.793594	0.013138	0.230594	5.206778	0.018032	0.316495	4.157048	0.014397	0.252687
z-value	1.034045	1.952507	0.747585	5.768560	1.104611	-3.278269	0.176794	-4.180739	1.191362
p-value	0.3011	0.0509	0.4547	0.0000	0.2693	0.0010	0.8597	0.00000	0.2335

CONCLUSION

This research sought to examine the relationship between environmental disclosures and firm performance, utilizing data from selected banks. The analysis used data covering multiple banks and years, focusing on key financial performance measures: Interest Income Per Employee (IIPE), Capital Adequacy Ratio (CAR), and Net Non-Performing Advances (NNPA). Firm size was included in the regression models as a control variable.

The descriptive analysis showed that firms with higher environmental scores (EDI) tend to have higher interest income per employee and better financial health in terms of lower non-performing advances. However, the relationship between environmental scores and capital adequacy was nuanced, indicating potential costs associated with higher environmental disclosures.

The findings of this study have substantial practical implications for diverse stakeholders. Firms should prioritize enhancing their environmental disclosures and practices, as higher environmental scores are associated with improved interest income per employee (IIPE) and overall financial health. This is particularly evident in the positive relationship between environmental scores and IIPE, indicating that firms with better environmental practices tend to generate higher interest income per employee. However, the impact of environmental scores on CAR is not statistically significant suggests that while there may be a trend where better environment performance correlates with stronger capital adequacy, the evidence is not robust enough to confirm the relationship conclusively.

Policymakers can leverage these insights to encourage transparent environmental disclosures by designing regulatory frameworks that incentivize firms to improve their environmental scores. Such frameworks would not only promote sustainability but also support firms' financial stability. Investors, on the other hand, should consider environmental scores as a crucial factor in their investment decisions, given that firms with higher environmental scores generally exhibit better financial health through lower non-performing advances.

Furthermore, companies should integrate environmental sustainability into their core strategies. The significant impact of environmental scores on IIPE and NNPA suggests that adopting sustainable practices can enhance long-term financial stability. These practical implications underscore the importance of balancing environmental investments with effective risk management practices to achieve sustainable and financially sound operations. By fostering better environmental disclosures and practices, firms can create additional value, attract investors, and contribute to overall market stability.

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