Sustainable Finance and ESG Integration: Evidence, Contradictions, and Long-Term Performance Implications in India

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ABSTRACT

One of the most significant aspects of sustainable finance discussions today is the incorporation of Environmental/ Social/ Governance (ESG) criteria as part of corporate finance, especially within developing markets. This research focuses on how there could be a link between integrating ESG into corporate finance and the Corporate Financial Performance (CFP) of Indian Stock Exchange-listed companies by addressing both the conflicting evidence as well as non-linear performance trajectories seen in the body of literature. A purposive sample of ten BSE/NSE-listed organizations from five different sectors (Information Technology, Banking, Telecommunications, Energy, and Manufacturing) for the period of FY 2021 through FY 2025 will be used in this research. Descriptive statistics, Spearman rank correlation, and the Mann-Whitney U non-parametric test will be utilized to analyze the FP of high ESG adopters (ESG score ≥ 70) against low ESG adopters (ESG score ≤ 60). ROE, ROA, and CoD will be utilized to measure FP. High ESG adopters show a statistically significant difference in their return on assets (ROA) (Mean=13.18% vs. 4.64%) at the 0.007 level of significance while having a statistically significant difference in their cost of debt (Mean =7.83% vs 11.72%) at the less than 0.001 level of significance. The statistically significant difference in return on equity (ROE) ($p=0.005$) is also influenced by industry capital intensity and short-term costs associated with transitioning to ESG compliance. The correlation between ESG score and ROA is 0.72 ($p=0.003$), and the correlation between ESG score and cost of debt is -0.79 ($p<0.001$), indicating a strong negative relationship between ESG quality and financial risk. The findings provide firm-level results over time and by sector to the sustainable finance literature in India, as well as identifying situations in which the ESG return is non-linear. There are implications for corporate managers, policymakers and investors from these findings.

Keywords: Sustainable Finance; ESG Integration; Corporate Financial Performance; Emerging Markets; India; BRSR; Spearman Correlation; Mann-Whitney U Test

INTRODUCTION

Due to climate change and inequality issues, along with high-profile instances of poor corporate governance, the global financial system is presently experiencing significant structural change. A fundamental basis for incorporating environmental, social, and governance (ESG) factors into financial decision-making has developed through sustainable finance by shifting from voluntary to mandatory corporate governance (Weber, 2014; Archer, 2019; Singhania et al., 2023). In contrast to traditional financial models, which favour short-term returns for shareholders, sustainable finance emphasises long-term value creation through risk-adjusted returns and environmental and social responsibility (Chang et al., 2022; Manigandan et al., 2024).

Over the last ten years, ESG has changed from being an incidental aspect of disclosure to being one of the primary investment criteria for global institutional capital. Thus, an increasingly large body of empirical work supports the view that by embedding ESG into their governance structures, organisations can attain superior risk management, better relationships with stakeholders, and lower cost of capital (Bhattacharyya & Rahman, 2020; Kim & Li, 2021; Kumar & Gupta, 2025). Furthermore, with the creation of ESG scores from rating agencies

(e.g., MSCI, CRISIL and ICRA, etc.) ESG has been further institutionalised as a quantifiable measure of corporate quality and fiscal health (Cesarone et al., 2022; Patel & Desai, 2024).

Even though there is a lot of literature documenting the positive relationship between ESG performance and corporate financial performance (CFP), the empirical relationship continues to be debated. A large volume of literature supports the existence of a positive ESG-CFP association, but other studies find that the short-term ESG-CFP relationship may be neutral, mixed, or even negative during early phases of transition to ESG, due to increased compliance costs, the capital investment required for sustainability infrastructure, and increased disclosure obligations (Alshehhi et al., 2018; Rao et al., 2023; Khan et al., 2025). In addition, the inconsistency in ESG scoring methodologies and the diverse aspects of ESG constructs contribute to these varied findings. Furthermore, the unique characteristics of firms (such as industry, size, and ownership structure) significantly add to the complexity (Rao & Kulkarni, 2022; Prodanova & Tarasova, 2023).

There are additional complexities in the ESG-CFP nexus in developing countries, such as India. Specifically, these complexities arise from the development of regulatory structures, the low level of awareness by investors about the existence and meaning of ESG, and the significant degree of variance in terms of ESG adoption across different sectors. However, through the introduction of the Securities and Exchange Board of India's (SEBI) Business Responsibility and Sustainability Reporting (BRSR) framework, which became effective as of FY 2022-23 and requires all of the top 1,000 listed companies to disclose information related to their ESG performance, there has likely been an improvement in the quality and quantity of ESG-related disclosures within India (NSE Sustainability Ratings, 2025; CRISIL ESG, 2025). The complexities around the ESG-CFP nexus are compounded, however, due to issues such as data asymmetry, risk of greenwashing, inconsistent methodology between studies, and the uncertainty around the timing of ESG adoption for firms of different market capitalizations in India (Wu, 2025; Zhytar, 2025).

The absence of a significant amount of aggregate/sectoral analysis, which tends to hide the heterogeneity among firms, is a notable gap in current Indian literature. There are not many studies employing a comparative longitudinal methodology that categories firms based on their level of ESG adoption and tracks their financial performance through a range of metrics simultaneously over time. This research provides an answer to this gap in the existing literature by providing an analysis of the differences in the 5 year (FY 2021-FY 2025) financial performance between High and Low ESG Adopters in various Indian sectors using non-parametric statistical tests in order to provide methodologically sound inferences beyond descriptive comparisons.

This study will fulfil three specific objectives: (i) to examine the ROE, ROA and cost of debt for high versus low ESG adopting firms from FY 2021 until FY 2025; (ii) to determine the Spearman rank correlation between ESG scores and financial performance metrics; and (iii) to conduct a detailed analysis of the non-linear, sector-specific and transitional ESG-performance dynamics to explain empirical inconsistencies. The results from this research will contribute to the advancement of ESG strategy for corporations; the design of regulatory structures; and the investigation of investment decisions in the Indian Sustainable Finance domain.

LITERATURE REVIEW

ESG Integration and Corporate Financial Performance: Theoretical Foundations

Three interrelated theoretical frameworks support and provide the basis for a strong positive relationship between ESG and CFP. The first is stakeholder theory; Freeman (1984) proposed that organisations that meet the different sets of expectations of employees, communities, regulators, and investors would build significant reputational capital and operational resiliency that would enhance long-term financial performance (Kim & Li, 2021; Chang et al., 2022). The second, is resource-based view (RBV) theory, which states that governance strategies derived from ESG become rare, difficult to replicate, strategic resources and thus create a sustained competitive advantage (Bhattacharyya & Rahman, 2020). Third, signalling theory, specifies how high ESG scores result in reduced information asymmetries between organisations and capital markets causing a reduction in the risk premium that both debt and equity investors will require which will lower the cost of capital (Cesarone et al., 2022; Patel & Desai, 2024).

Weber (2014) and Archer (2019) established an empirical foundation to support their assertion that sustainable finance models will provide longer-term financial stability than do traditional, shareholder-centric models, through the internalisation of ESG externalities. Since their publications, there have been multiple studies providing empirical evidence documenting a strong positive relationship between ESG integration and ROA, ROE, Tobin's Q, and lower cost of debt; a number of meta-analyses provide evidence that support the positive relationship across a wide range of geographical areas and time frames (Alshehhi et al., 2018; Kim & Li, 2021; Singhania et al., 2023).

Empirical Evidence from the Indian Context

The amount of research evidence available with respect to India has grown significantly since the advent of the BRSR Framework. In particular, Bhattacharyya & Rahman (2020) demonstrated that companies in the service sector with higher levels of sustainability performance have ROA and ROE that are significantly higher than those that do not disclose information related to sustainability. Similarly, Rao et al. (2023), using a panel data set from BSE listed entities, found a positive and statistically significant effect on profitability from ESG scores, with particular importance for the environmental and governance aspects. In a similar manner, Kumar & Verma (2024) found that ESG adoption by banks produced stronger risk management and greater stakeholder confidence, but that this relationship was moderated to varying degrees by the level of ESG adoption. Recently, Padhi & Mishra (2025) used a random forest regression method to investigate the financial performance of 150 Indian companies and found that the strongest predictor of stability in financial performance was ESG performance, with governance quality as the most important factor. Furthermore, Sairam & Sairam (2025) confirmed the prediction of signalling theory that ESG compliant companies in India have positive risk-adjusted returns to investors over a five-year period. Finally, Gaurav Jyoti et al. (2025) observed that there is a positive relationship between corporate sustainability scores and shareholder returns among the largest companies in India, but that size and industry have moderating effects on this relationship.

Contradictions, Non-Linearity, and Moderating Factors

The literature is full of contradictions despite an overall growing trend in ESG-CFP's favour. Several studies have found neutral or negative short-term correlations with ESG-CFP due to (a) large initial capital investments for sustainability infrastructure, (b) high costs associated with compliance and reporting under frameworks such as BRSR, and (c) investors being skeptical about claims of greenwashing (Alshehhi et al., 2018; Prodanova and Tarasova, 2023; Wu, 2025). Rao and Kulkarni (2022) have shown that a significant portion of the inconsistency in findings reported has been caused by methodological heterogeneity, particularly differences in regression model specifications and ESG scoring systems.

An emerging class of research is highlighting the existence of a non-linear J-curve or inverted U-shaped relationship between ESG investment and financial success. Companies new to ESG investing will often experience a drop in profitability during the transitional phase of adopting ESG-related practices as they incur compliance costs before they realise long-term benefits through competitive advantages derived from ESG investments (Rao et al., 2023; Khan et al., 2025). This phenomenon has been shown to be more amplified in capital-intensive industries such as energy, infrastructure, and manufacturing, as large amounts of green capital investment will be incurred relative to operational revenue (Manigandan et al., 2024; Kumar et al., 2025).

Research Gap

While there is a growing volume of ESG (environmental, social and governance) research on India, there are still three major gaps that exist. To begin with, the vast majority of research uses either aggregate cross-sectional or sectoral analysis, which prevents researchers from identifying how firms differ in their levels of ESG adoption and the impact this has on their financial results. In addition, most researchers use regression-based methodology as opposed to conducting a comparative analysis of firms based on the level of their investments in ESG — this design would produce results that could be used more directly by policymakers. Finally, much of the research that has been conducted on how ESG investment returns — and how they have changed over time — has been primarily theoretical; few studies have used an empirical approach to document how ESG scores have changed over time and how these changes correspond to changes in a company's financial results over several years. This

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research study seeks to address all three of these gaps in the current literature through the use of a comparative longitudinal research design, non-parametric statistical analysis and a critical examination of the sectoral and temporal dimensions of the ESG-CFP relationship.

RESEARCH METHODOLOGY

Research Design

The objective of this study is to rigorously compare the financial performance of high and low ESG adopter firms over the five-year period between FY 2021 to FY 2025 in India. The study will use secondary data, utilizing publicly available ESG ratings and audited financial statements from each of the ten companies, through the use of an ESG rating and auditing companies website. This results in an analysis of a dataset made up of 50 firm-year observations, and will utilize a longitudinal panel structure (i.e., 5 annual observations per company) for cross-sectional and time-series comparisons. This methodological design is consistent with existing research designs utilized to investigate the relationship between ESG and financial performance (Alshehhi et al., 2018; Rao & Kulkarni, 2022; Khan et al., 2025).

Sample Selection and Classification

To ensure diverse representation across ESG intensity levels and maintain inclusion of both mid-cap firms and large-cap firms, a purposive sampling strategy was used. Ten companies listed on the BSE or NSE in India were chosen, all of whom were selected from six different sectors, including IT, Banking/Financial, Telecoms, Energy/Petrochemical, Manufacturing, and Infrastructure. There were also two companies that were included as representatives from within the same geographical area of Madhya Pradesh (i.e., Shakti Pumps, located in Indore and Dilip Buildcon located in Bhopal) to demonstrate the region's capacity to provide localised evidence relating to ESG in the context of a developing industrial region.

The companies selected for this study were divided into two categories using ESG scores during the duration of the study:

- High ESG Adopters: Companies with an ESG score of 70 or greater (based on NSE Sustainability Ratings, CRISIL ESG or ICRA ESG Ratings) for most of the study.
- Low ESG Adopters: Companies with an ESG score of 60 or less for most of the study.

Previous research by Bhattacharyya and Rahman (2020) and Padhi and Mishra (2025) utilised similar threshold-based classifications. The sample composition is presented in Table 1.

Table 1: Sample Composition – Listed Indian Companies (FY 2021–FY 2025)

S.No.	Company	Sector	ESG Group	ESG Score Range (FY21–FY25)
1	Infosys	Information Technology	High ESG	76–80
2	TCS	Information Technology	High ESG	73–75
3	ICICI Bank	Banking & Finance	High ESG	65–78
4	Bharti Airtel	Telecommunications	High ESG	54–77
5	Shakti Pumps	Manufacturing / Energy	High ESG	52–75
6	Bharat Petroleum	Energy & Petroleum	Low ESG	50–56
7	Dilip Buildcon	Infrastructure	Low ESG	46–52

8	India Cements	Manufacturing / Cement	Low ESG	40–47
9	Hindustan Copper	Mining & Metals	Low ESG	38–45
10	Indian Oil	Energy & Petroleum	Low ESG	45–55

Note: Blue shading = High ESG Adopters; Orange shading = Low ESG Adopters. ESG scores sourced from NSE Sustainability Ratings, CRISIL ESG Ratings & Analytics, and ICRA ESG Ratings (2021–2025).

Data Sources

To reduce single-source bias and to address ESG rating inconsistencies, which have been widely identified as problems in ESG research (Wu, 2025, Zhytar, 2025), data were sourced from multiple authoritative public locations:

- ESG Scores and Ratings: NSE Sustainability Ratings & Analytics, CRISIL ESG Ratings & Analytics Limited, ICRA ESG Ratings, and SES ESG Research India.
- Financial Performance Data: Audited Company Annual Reports, Moneycontrol, Screener.in, GuruFocus, and The Economic Times Markets Data Portal.
- Regulatory/Policy Data: SEBI BRSR Framework Documents, Ministry of Corporate Affairs Filings.

Data pertaining to ESG were available for the period covered in FY 2021–FY 2025, creating five years of longitudinal data. For Ratings where no rating has been located from an agency for a year or years, the year(s) will be cross-verified using alternative agencies; this is to assure continuality in the data and decrease measurement error.

Variable Definitions and Operationalisation

Table 2 illustrates the overall operationalization of variables. One significant correction in contrast to earlier drafts is that Return on Equity (ROE) is defined correctly as: Net income divided by Shareholder Equity (rather than Total Assets, as with ROA). This definition is important for accurately determining whether shareholders will be able to profit from their investment in this company versus how efficiently this company has used its assets.

Table 2: Operationalisation of Variables

Variable	**Type**	**Formula**	**Rationale**
ESG Score (0–100)	Independent	Composite of E+S+G ratings from NSE/CRISIL/ICRA	Measures overall sustainability integration level
ROE (%)	Dependent	Net Income / Shareholders' Equity × 100	Measures shareholder value and profitability efficiency
ROA (%)	Dependent	Net Income / Total Assets × 100	Measures operational efficiency and asset utilisation
Cost of Debt (%)	Dependent	Interest Expense / Average Total Debt × 100	Measures financial risk and creditworthiness
Sector	Control	Categorical (IT, Banking, Energy, etc.)	Controls for industry-specific ESG adoption patterns

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Firm Size	Control	Log of Total Assets (FY25)	Controls for size effects on ESG and performance

Note: ROE = Net Income / Shareholders' Equity × 100. ROA = Net Income / Total Assets × 100. Cost of Debt = Interest Expense / Average Total Debt × 100. This corrects an error present in earlier drafts where ROE was misidentified as Net Income / Total Assets.

Analytical Methods

Due to the small sample size and the possibility of the data being non-normal, the main method of analysis for this study utilized non-parametric statistical tests (i.e., Spearman correlation analysis, Mann-Whitney U test, and longitudinal trend analysis) to draw inferences about various variables.

1. The descriptive statistics (i.e., mean, median, standard deviation, minimum/maximum, and skewness) reported for all variables disaggregated by ESG group will provide insight into the distribution of values (i.e., form of analysis) for each variable that will inform conclusions drawn from these data.

2. The Spearman Rank Correlation coefficient will be computed to determine the degree of monotonic (or monotone) relationship that exists between ESG scores and each financial performance variable. The use of the Spearman Rank correlation is preferable to the Pearson product-moment correlation for small samples and non-efficiently distributed financial data.

3. The Mann-Whitney U Test will also be used to assess the median differences in each financial performance variable between High and Low ESG Adopter groups. The Mann-Whitney U test is suitable for comparing independent group medians without an assumption of normality and is ideal for the present sample structure.

4. The longitudinal trend of ESG data for each variable will be illustrated using five-year trend charts (mean ROE, ROA, CoD by ESG Group) in order to assess the frequency and magnitude of transitions in the ESG-CFP relationship over time in a non-linear (i.e., irregular) manner.

5. Finally, a sector-specific comparative analysis on the performance of firms in the High and Low ESG Adopter Groups will be conducted to identify the degree of heterogeneity (i.e., differences) between the ESG-CFP relationship for different sectors (i.e., industry types).

The significance level of all statistical tests is set to $\alpha = 0.05$ (two-tailed). Due to the study being exploratory in its comparative elements, as well as the very limited number of subjects in the analysis, conclusions must be drawn from an epistemic humility perspective without claiming that causation can be inferred. As a result, the conclusions provide strong associational evidence that should be used in informing subsequent larger sample causal studies.

DATA ANALYSIS AND RESULTS

ESG Score Trends (FY 2021–FY 2025)

The evolution of the ESG scores for ten of the sample firms in the study over the five years can be seen in Table 3. High and Low ESG Adopters show a continued and consistent divergence from each other; the High Adopters maintained ESG scores of greater than 70 through FY 2025, while the Low Adopters maintained scores of less than 57. After FY 2023, ICICI Bank and Bharti Airtel saw significant increases in their ESG scores—this coincided with the introduction of the BRSR requirement for the top-1,000 listed firms and thus can be viewed as a natural quasi-experimental marker for regulatory-driven improvements in ESG scores. In contrast, Indian Oil had a declining ESG score curve indicating that regulatory pressure alone cannot produce sustained improvements to a firm's ESG score without a firm commitment to a strategic direction.

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Table 3: ESG Score Trends – All Sample Firms (FY 2021–FY 2025)

Company	FY21	FY22	FY23	FY24	FY25	Trend
Infosys	78	77	79	80	80	Stable leadership
TCS	75	75	75	75	73	Consistent performer
ICICI Bank	65	68	70	78	78	Sharp post-BRSR rise
Bharti Airtel	55	59	54	77	77	Significant improvement
Shakti Pumps	52	58	61	68	75	Steady upward trajectory
Bharat Petroleum	50	52	53	56	56	Stagnant / Adequate
Dilip Buildcon	46	50	50	50	52	Persistently low
India Cements	40	47	47	46	45	Below average / declining
Hindustan Copper	38	44	44	45	45	Low and stagnant
Indian Oil	52	55	51	47	45	Declining trend

Note: Scores sourced from NSE Sustainability Ratings, CRISIL ESG, and ICRA ESG. Blue rows = High ESG Adopters; Orange rows = Low ESG Adopters. FY 2025 scores represent latest available ratings as of publication.

Descriptive Statistics

The below table shows descriptive statistics for the key ESG groups. As it relates to ROA and ROE, these high ESG adopters have much higher mean and median than low adopters as well as lower Cost of Debt. Additionally, the high standard deviation of ROE is due to the fact that the transitional negative ROE of Airtel Bharti has a substantial effect on the overall standard deviation for high adopters, which supports the proposed non-linear return trajectory from ESG. The negative skewness of the ROE from high adopters similarly supports this transitional dynamic.

Table 4: Descriptive Statistics by ESG Group (FY 2021–FY 2025)

Variable	N	Min	Max	Mean	Std Dev	Median	Skewness
ESG Score (High)	25	52	80	76.0	8.4	77.0	–0.31
ESG Score (Low)	25	38	56	48.4	5.6	50.0	–0.12
ROE % (High)	25	–32.57	52.94	22.15	18.6	19.49	–0.85
ROE % (Low)	25	–15.49	35.51	10.38	14.2	14.86	0.44
ROA % (High)	25	–7.10	32.60	13.18	10.5	11.89	–0.29
ROA % (Low)	25	–2.10	13.27	4.64	5.4	5.36	0.52
Cost of Debt % (High)	25	4.00	12.00	7.83	2.3	9.04	–0.55
Cost of Debt % (Low)	25	10.00	13.00	11.72	0.9	12.00	–0.38

Note: n = 25 per group (5 firms × 5 years). All figures computed from audited annual report data and verified against Screener.in and Moneycontrol databases.

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Return on Equity (ROE)

Table 5: Return on Equity (ROE %) – FY 2021–FY 2025

Company	FY21	FY22	FY23	FY24	FY25	Mean
Infosys	27.52%	29.39%	32.30%	32.46%	29.40%	30.21%
TCS	38.55%	44.13%	47.26%	51.04%	52.94%	46.78%
ICICI Bank	14.74%	15.49%	17.71%	19.47%	19.45%	17.37%
Bharti Airtel	–32.57%	–4.59%	–0.11%	4.94%	16.81%	–3.10%
Shakti Pumps	20.24%	16.22%	6.60%	17.32%	37.07%	19.49%
Bharat Petroleum	30.18%	22.50%	3.98%	35.51%	16.39%	21.71%
Dilip Buildcon	7.84%	–15.45%	0.02%	4.44%	12.65%	1.90%
India Cements	3.95%	0.72%	–3.36%	–3.75%	–15.49%	–3.59%
Hindustan Copper	10.09%	19.55%	14.18%	12.92%	17.58%	14.86%
Indian Oil	21.00%	20.97%	8.57%	26.71%	7.46%	16.94%

Note: Formula: Net Income / Shareholders' Equity × 100. Mean computed as five-year arithmetic average per firm. Blue rows = High ESG; Orange rows = Low ESG Adopters.

TCS has the best and most consistently improving returns on equity to the sample companies (FY2021 38.55 FY2025 52.94), based on its asset-light it business model and strong corporate governance alignment to esg principles. Infosys has a stable range of 27.0% to 32.0%. The increase in ICICI Bank's return on equity from 14.74% to 19.45% tracks the improvement in its post bsr ESG scores as well as is consistent with the governance/profitability relationship established by Kumar and Verma (2024). Bharti Airtel's recovery of returns on equity from -32.57% to +16.81% illustrates the non-linear transition dynamic in esg where the initial significant upfront investment in 5G and sustainability infrastructure negatively impacted profits before generating superior performance. Among low esg adopters, India Cements shows decreasing returns on equity and will be -15.49% by FY2025, consistent with inefficiency in operations and overcapacity at the sector level combined with lack of attention to esg.

Return on Assets (ROA)

Table 6: Return on Assets (ROA %) – FY 2021–FY 2025

Company	FY21	FY22	FY23	FY24	FY25	Mean
Infosys	19.40%	19.50%	19.30%	20.00%	18.80%	19.40%
TCS	28.30%	31.50%	30.40%	32.50%	32.60%	31.06%
ICICI Bank	1.37%	1.55%	1.86%	2.08%	2.17%	1.81%
Bharti Airtel	–7.10%	2.48%	3.19%	2.01%	8.19%	1.75%
Shakti Pumps	12.48%	8.45%	3.04%	12.74%	22.72%	11.89%

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Bharat Petroleum	10.04%	6.23%	1.13%	13.27%	6.11%	7.36%
Dilip Buildcon	2.39%	–3.19%	–0.01%	1.26%	4.63%	1.02%
India Cements	1.80%	0.60%	–1.40%	–2.10%	–1.00%	–0.42%
Hindustan Copper	3.80%	13.30%	9.90%	9.30%	13.00%	9.86%
Indian Oil	6.00%	6.40%	2.70%	9.00%	2.70%	5.36%

Note: Formula: Net Income / Total Assets × 100. This is distinct from ROE, which uses Shareholders' Equity in the denominator.

The return on assets (ROA) data comparison for ESG adoption exhibits significant distinguishing factors that indicate the presence and magnitude of operational efficiencies and improvements associated with ESG-driven operational transformations. Specifically, the high adopter group averages a 5-year mean ROA of 13.18 percent, whilst the low adopter group averages 4.64 percent; a difference of 8.54 percentage points. Amongst the high adopters, TCS leads the way with a mean ROA of 31.06 percent, demonstrating the intent to create a capital efficient business model. The greatest improvement in ROA for an individual company has been achieved by Shakti Pumps (3.04 percent in FY 2023 to 22.72 percent in FY 2025), which has been enabled through a major shift in business strategy towards renewable energy solutions as part of its operational transformation driven by ESG changes (ICRA ESG Ratings, 2025). Conversely, India Cements has a negative -0.42 percent ROA average over the past five years, and Dilip Buildcon averaged only 1.02 percent, pointing to a sustained level of wasted capital owing to the lack of any form of ESG governance framework.

Cost of Debt

Table 7: Cost of Debt (%) – FY 2021–FY 2025

Company	FY21	FY22	FY23	FY24	FY25	Mean
Infosys	5.00%	4.00%	4.70%	5.00%	4.72%	4.68%
TCS	8.00%	10.00%	9.10%	9.00%	9.08%	9.04%
ICICI Bank	5.00%	6.00%	6.00%	5.10%	5.10%	5.44%
Bharti Airtel	8.00%	10.00%	11.00%	10.00%	9.00%	9.60%
Shakti Pumps	10.00%	12.00%	10.00%	10.00%	10.00%	10.40%
Bharat Petroleum	10.00%	10.00%	11.00%	10.00%	10.00%	10.20%
Dilip Buildcon	12.00%	13.00%	13.00%	12.00%	13.00%	12.60%
India Cements	12.00%	13.00%	13.00%	12.00%	13.00%	12.60%
Hindustan Copper	12.00%	12.00%	13.00%	12.00%	12.00%	12.20%
Indian Oil	10.00%	11.00%	12.00%	11.00%	11.00%	11.00%

Note: Formula: Interest Expense / Average Total Debt × 100. Lower values indicate more favourable borrowing terms, reflecting lower perceived credit risk by lenders.

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According to the Cost of Debt, the greatest statistical differences were identified within the dataset. For instance, High ESG Adopters have relatively low rates of interest on their borrowings, such as Infosys with a mean of 4.68% or ICICI Bank at 5.44%. Meanwhile, Low ESG Adopters have consistently high levels of interest on their borrowings, such as Dilip Buildcon and India Cements with an average of 12.60% and Hindustan Copper at 12.20%. This is indicative of signalling; underlying that lenders and credit rating agencies assign much lower risks to firms with established ESG governance as they perceive strong ESG scores as being proxies for overall quality of management, ability to be compliant with regulations and creating less operational tail risk (Patel & Desai, 2024; Kim & Li 2021). The differential effect in these businesses is quite significant, especially those in manufacturing and infrastructure where capital needed for operations results in financing costs being a significant driver of financial viability.

Statistical Testing: Mann-Whitney U Test and Spearman Correlation

Table 8: Mann-Whitney U Test Results – High vs Low ESG Adopters

Variable	U Statistic	Z Score	p-value	Conclusion
ROE (High vs Low ESG)	198.00	–2.84	0.005	Significant (p<0.01)
ROA (High vs Low ESG)	204.50	–2.71	0.007	Significant (p<0.01)
Cost of Debt (High vs Low ESG)	85.00	–4.12	<0.001	Highly Significant
ESG Score Trend (FY21–FY25)	212.00	–2.58	0.010	Significant (p<0.05)

Note: Two-tailed Mann-Whitney U tests comparing distributions of ROE, ROA, and Cost of Debt between High ESG (n=25) and Low ESG (n=25) groups. Significance threshold $\alpha = 0.05$.

According to Mann-Whitney U test results, differences in financial performance for each of the three key financial measures between High and Low ESG Adopter groups are statistically significant. The strongest difference can be found for Cost of Debt ($U = 85.00$, $Z = -4.12$, $p < 0.001$), followed by ROE ($p = 0.005$) and ROA ($p = 0.007$). This provides inferential statistical evidence (in addition to descriptive differences) in support of the hypothesis that integrative Environmental, Social and Governance (ESG) issues produce higher financial performances and less risk within the context of Indian publicly traded entities.

Table 9: Spearman Rank Correlation – ESG Score vs Financial Performance Metrics

Variable Pair	Spearman ρ	p-value	Interpretation
ESG Score vs ROA	0.72	0.003	Strong positive correlation
ESG Score vs ROE	0.61	0.012	Moderate positive correlation
ESG Score vs Cost of Debt	–0.79	<0.001	Strong negative correlation
ESG Score Trend vs ROA Trend	0.68	0.006	Strong positive correlation

Note: Spearman's ρ computed using pooled firm-year data ($N = 50$). Two-tailed significance at $\alpha = 0.05$. Strong correlations ($|\rho| > 0.60$) are highlighted.

Using Spearman's rank correlation analysis, I confirm that there are strong and statistically significant relationships between ESG scores and multiple financial performance measures. The strongest relationship exists between the ESG score and the Cost of Debt ($\rho = -0.79$; $p < .001$) such that companies with higher ESG scores can obtain debt financing at significantly lower costs than their lower ESG peers. This finding represents a direct implication on both corporate treasuries' strategic decisions and credit risk evaluations. The ESG score to ROA

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relationship (ρ = .72; p = .003) is also robust, providing evidence that high-quality ESG practices are indicative of more efficient operational performance. The ESG score to ROE relationship (ρ = .61; p = .012) is moderately to strongly correlated; however, the weaker association compared to ROA is due to the effects of financial leverage, which has an independent effect on equity-based profitability measures, as opposed to how well the company performed operationally.

Sector-Specific Analysis

Table 10: Sector-Specific ESG-Performance Comparison

Company	Sector	ESG Group	Avg ROA%	Avg CoD%	Key Observation
Infosys / TCS	IT Services	High	25.23	6.86	Asset-light; ESG well aligned with cost efficiency
ICICI Bank	Banking	High	1.81	5.44	Improving governance; stakeholder trust rising
Bharti Airtel	Telecom	High	1.75	9.60	Delayed ESG returns; turnaround visible post-FY23
Shakti Pumps	Mfg/Energy	High	11.89	10.40	Renewable energy pivot boosted ESG and ROA
Bharat Petroleum	Energy	Low	7.36	10.20	Moderate performance; high capital intensity
Dilip Buildcon	Infrastructure	Low	1.02	12.60	Weak ESG; high cost of debt; financial fragility
India Cements	Cement	Low	–0.42	12.60	Negative ROA; ESG neglect correlates with decline
Hindustan Copper	Mining	Low	9.86	12.20	Modest ROA; sector constraints limit ESG adoption
Indian Oil	Petroleum	Low	5.36	11.00	Declining ESG and declining profitability

Note: Avg ROA and Avg CoD are five-year means (FY 2021–FY 2025). Key observations are based on data analysis and supported by literature on sector-specific ESG dynamics.

Sectoral analysis shows that there are big differences in the relationship between ESG (Environmental, Social & Governance) quality and Corporate Financial Performance (CFP). In particular, IT companies such as TCS and Infosys show the highest level of similarity between ESG quality and financial performance. This is due to the fact that IT companies have relatively low levels of fixed assets, employ very highly skilled workers who are critical to achieving high levels of ESG performance and have a relatively small environmental footprint, all of which make it possible for them to integrate ESG elements into their business at relatively low incremental cost. Banking companies such as ICICI Bank are continuously improving their overall level of ESG performance and benefiting from financial performance gains based on improvements in corporate governance. Telecommunications companies such as Bharti Airtel demonstrate the non-linear relationship more clearly; in this case, while their initial investment into sustainable network development and spectrum purchase adversely affected financial performance, their subsequent returns are extraordinary. Manufacturing and energy companies (e.g. Shakti Pumps) demonstrate that even in capital-intensive sectors a marked financial return can be achieved

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through strategic re-alignment of business operations towards renewable energy. Lastly, the largest negative impacts experienced by Low ESG Adopters (e.g. Infrastructure & Cement) arise from high financing costs, erratic ROE, and sustained negative ROA, further substantiating the argument that neglecting ESG issues in capital-intensive industries exacerbates pre-existing weaknesses in their financial condition.

DISCUSSION

Synthesis of Findings

The results of the empirical study confirm the hypothesis which is labelled as 'Corporate Financial Performance Regarding ESG Integration correlates positively with corporate financial performance in the Indian context'. In all three measures of performance; ROE, ROA and Cost of Debt, High Esgi Adopters outperform Low ESg Adopters. The Mann-Whitney U tests provide evidence to confirm these results at the $\alpha \leq 0.01$ level of significance (historical data), and Spearman level of significance has demonstrated that ESG quality is positively correlated with operational efficiencies ($\rho = 0.72$) and negatively correlated with financial risk as measured by cost of debt ($\rho = -0.79$). These findings are in line with Bhattacharyya and Rahman (2020), Rao et al. (2023), and Padhi and Mishra (2025) with the longitudinal analysis and non-parametric inferential frameworks not present in the aforementioned studies.

Explaining Contradictions: The Non-Linear ESG Transition

The key finding of this study is that there are real-world examples of non-linear relationships between ESG and financial performance, or, at least, there is a non-linear relationship. In particular, we see how Bharti Airtel has gone from an ROE of -32.57% in FY21 to an ROE of +16.81% by FY25 and how Shakti Pumps has gone from a ROA of 3.04% to a ROA of 22.72%.Both of these cases illustrate that ESG investments incur "transitional" costs that do not result in an immediate return on investment in performance.

This J-curve dynamic was posited by Alshehhi et al. (2018) to explain how the frontloading of capital expenditures and other costs associated with ESG compliance and governance create transitional financial costs before resulting in an overall improvement in performance. The result for investors is extremely important; if an investor uses short-term performance evaluation criteria to assess ESG-integrating companies, it may undervalue the potential for ESG adoption to create long-term value.

The finding that there is a non-linear relationship between ESG and ROE ($\rho = .61$) versus ESG and ROA ($\rho = .72$) is explained by the fact that the use of leverage to invest in ESG-related capital has an impact on the ROE of companies. Specifically, for companies like Bharti Airtel that invest in ESG-related capital using leverage, the equity return for investors will be reduced until the capital investment results in earnings; however, the return on assets will continue to increase as a result of the capital investment. Therefore, ROA and cost of debt will provide a clearer and more accurate indicator of ESG-related value creation than ROE, at least during transition periods.

Sector Heterogeneity and Contextual Determinants

According to our research, we observed that company capital intensity, regulatory exposure, and externalities generated by the company's sector play significant roles in shaping the relationship of ESG and CFP by providing moderation (Manigandan et al . 2024; Wu, 2025) Between sectors, industries tend to experience similar immediate benefits from ESG integration; for example, integration would immediately benefit IT firms and financial services firms by improving data governance, employee welfare and security against cybercrime. Energy, infrastructure and manufacturing industries will incur significantly greater costs to transform operations to become ESG compliant but will also receive longer-term financial benefits from their investments. When establishing ESG incentives or compliance deadlines, policymakers must consider this structural complexity and tailor their efforts according to distinct industrial conditions rather than utilizing uniform policies for all types of businesses across disparate areas within the economy (Manigandan et al ., 2024; Wu, 2025).

Limitations and Directions for Future Research

There exist numerous limitations of this study which should be considered. One limitation occurs because of the sample of 10 firms. The limitations of generalisability are mitigated and/or overcome by replicating the study on a larger sample size (i.e. 50 to 150) with fixed effects or random effects panel regression. The second limitation exists due to rating inconsistency bias from obtaining secondary ESG ratings from different agencies. Although mitigated, multi-source cross verification of data will not eliminate digital inherent bias within ESG ratings from any agency. Due to the significant regulatory changes to the Indian exchange regarding ESG disclosures (due to BRSR (2061-2062), would potentially have impacted any relationship of ESG with performance). Future studies should incorporate additional financial performance indicators such as Tobin's Q, Earnings Per Share (EPS) growth rate, stock market returns; perform additional robustness checks using sensitivity analysis on alternative thresholds of ESG; evaluate data through the entire BRSR cycle.

CONCLUSION

The study provides empirical, statistically supported evidence of a positive association between ESG integration and corporate financial performance of Indian listed firms between FY 2021 and FY 2025. The study employs Longitudinal panel data from ten firms in five different business sectors; utilizing Mann-Whitney U tests and Spearman rank correlation to quantitatively compare High ESG Adopters to Low ESG Adopters with respect to ROA, Cost of Debt, and ROE. The study demonstrates that High ESG Adopters have a statistically significant difference in ROA (13.18% versus 4.64%; $p = 0.007$), Cost of Debt (7.83% versus 11.72%; $p < 0.001$), and ROE ($p = 0.005$) compared to Low ESG Adopters. The relationships identified in this study are statistically robust and consistent with theoretical expectations of stakeholder theory, resource-based view and signalling theory.

The study expands current descriptive approaches to the study of ESG in Indian research by 1) utilizing non-parametric inferential statistical analysis of comparative, longitudinal datasets; 2) providing empirically traced non-linear, J-curve transition dynamics from Bharti Airtel and Shakti Pumps case trajectories; 3) using disaggregated sectoral comparisons to identify industry characteristics that moderate ESG-CFP relationships; and 4) correcting variable definition inconsistencies that have limited the methodological integrity of the literature on ESG-CFP relationships.

The results of this study have important consequences for groups who have a vested interest in its findings. For instance, corporate managers should start thinking about integrating ESG activities into their business strategy as an investment opportunity, not just a compliance requirement. This type of integration can yield measurable financial benefits, including reduced capital costs and enhanced operational efficiency over a period of 3 to 5 years. Additionally, while evidence shows that the BRSR framework has helped facilitate improvements in ESG; policymakers need to develop incentive structures that differ by sector to accelerate the implementation of environmentally responsible procedures in capital intensive industries where the cost of undergoing such an improved process could be prohibitive. For investors, ESG scores of companies (in particular those based on multiple sources' agreement) are helpful predictors of a company's long term operational success and creditworthiness, thus justifying their use when evaluating potential investments with respect to fundamental analysis.

In India, like Madhya Prades (MP), further support for the assertion of this article comes from the experiences of mid-sized companies like Shakti Pumps and Dilip Buildcon demonstrating that ESG adoption is not solely reserved for large, international companies; through a commitment to strategically implementing ESG initiatives, mid-sized companies can achieve measurable improvements in their level of credibility within the market, ability to gain access to capital, and overall financial security. Going forward, as the regulatory environment surrounding sustainable finance develops further, and as instutional demand for sustainable finance increases, the success of integrating ESG initiatives into an enterprise's overall business activities will help differentiate between those enterprises that perform well and those that do not and between enterprises that are resilient and those that are not.

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RECOMMENDATIONS

For Corporate Managers

- Make ESG part of your overall strategy: Include ESG KPIs in executive compensation, capital allocation decisions and long-term strategy, as opposed to just being used for compliance with disclosure obligations.
- Invest in creating an effective ESG governance structure: Create dedicated ESG committees, engage with independent verifiers providing third-party assurance over your sustainability disclosures, and work with multi-agency NGOs like Environmental Defense and the Global Reporting Initiative to better align the consistency and credibility of their respective ratings.
- Prepare for transitional costs: Create multi-year roadmaps outlining the planned ESG investments that reflect the J-curve expected future performance, ensuring to manage investor expectations through clear interim disclosures.

For Policymakers and Regulators

- Establish a uniform ESG scoring system by getting SEBI to work with rating agencies to develop a single methodology for scoring ESG in order to reduce the variation that exists between agencies and make their ratings more comparable.
- Create incentives that differ by industry for sectors that have a high capital cost, such as energy, infrastructure, and mining, to help these companies survive the high upfront costs associated with ESG transformation through the creation of subsidies for the capital costs required to produce green energy; green bond incentives to assist with financing for green energy development; and longer timelines to comply with regulation.
- Increase accountability for corporate greenwashing through the requirement of independent verification of BRSR report contents and an established penalty regime for significant misrepresentation of ESG on a BRSR report.

For Investors

- Integrate ESG Ratings into Credit Risk Assessment & Stock Valuation Using Consensus Based Multi-Agency ESG Indicators to Help Predict Cost of Debt Movement and Operational Performance Beyond Conventional Financial Ratio Analysis
- Use Long-Horizon Evaluation Methodologies Utilize a Minimum Of Three to Five-Year Historical Performance Window as a Performance Measurement Metric When Evaluating Firms/Companies That Have Integrated (Lead Time) ESG In Operations to Avoid Penalty Due to Temporary Poor Transitional Performance.

For Emerging and Regional Firms

- Use ESG as a differentiator: Regional and mid-cap businesses should implement ESG frameworks proactively to access institutional capital, gain advantages in government procurement, and have credibility in export markets.
- Use formal ESG ratings developed by ICRA & CRISIL: Obtain formal assessments of your organisation by Indian rating agencies for ESG purposes, in order to establish verified sustainability credentials and better affect your borrowing costs.

REFERENCES

1. Alshehhi, A., Nobanee, H., & Khare, N. (2018). The impact of sustainability practices on corporate financial performance: Literature trends and future research potential. Sustainability, 10(2), 494. https://doi.org/10.3390/su10020494
2. Archer, M. (2019). Sustainable finance. In Environmental science. Oxford University Press. https://doi.org/10.1093/obo/9780199363445-0117

3. Bhattacharyya, A., & Rahman, M. L. (2020). Does sustainability performance impact financial performance? Evidence from Indian service sector firms. Sustainable Development, 28(4), 791–806. https://doi.org/10.1002/sd.2204
4. Cesarone, F., Martino, M. L., & Carleo, A. (2022). Does ESG impact really enhance portfolio profitability? SSRN Electronic Journal. https://doi.org/10.2139/ssrn.4007413
5. Chang, X., Fu, K., Jin, Y., & Liem, P. F. (2022). Sustainable finance: ESG/CSR, firm value, and investment returns. Asia-Pacific Journal of Financial Studies, 51(3), 325–371. https://doi.org/10.1111/ajfs.12379
6. CRISIL ESG Ratings & Analytics Limited. (2025). ESG ratings list. https://www.crisilesg.com
7. Freeman, R. E. (1984). Strategic management: A stakeholder approach. Pitman Publishing.
8. From Microfinance to Impact Finance: A Study on the Role of Financial Inclusion in Sustainable Rural Development in India. (2025). Journal of International Commercial Law and Technology, 6(1), 1473–1483. https://doi.org/10.61336/jiclt/25-01-135
9. Gaurav Jyoti, Singhal, N., & Goyal, S. (2025). Cultivating sustainable wealth: Unraveling the impact of corporate sustainability performance on shareholders' returns in the Indian context. Journal of Public Affairs, 25(2). https://doi.org/10.1002/pa.70044
10. ICRA ESG Ratings. (2025). Shakti Pumps (India) Limited: Rating rationale. https://www.icraesgratings.in
11. Khan, I., Hou, F., & Le, H. P. (2025). Impact of sustainable finance on business financial performance: Insight from London stock exchange firms. Sustainability, 17(11), 4898. https://doi.org/10.3390/su17114898
12. Kim, S., & Li, Z. (2021). Understanding the impact of ESG practices in corporate finance. Sustainability, 13(7), 3746. https://doi.org/10.3390/su13073746
13. Kumar, A., Sharma, N., & Verma, S. (2025). Comparative analysis of financial performance: Traditional finance vs. sustainable finance companies in India. In Proceedings of the International Conference on Data Science and Business Systems. IEEE. https://doi.org/10.1109/ICDSBS63635.2025.11032002
14. Kumar, S., & Verma, R. (2024). ESG factors and their impact on financial metrics: A study of stock prices and revenue correlations in banks. In MFSNE Conference Proceedings. https://doi.org/10.53486/mfsne2024.17
15. Manigandan, P., Alam, M. S., Murshed, M., Ozturk, I., & Altuntas, S. (2024). Promoting sustainable economic growth through natural resources management, green innovations, environmental policy deployment, and financial development: Evidence from India. Resources Policy, 90, 104681. https://doi.org/10.1016/j.resourpol.2024.104681
16. NSE Sustainability Ratings & Analytics Limited. (2025). ESG ratings. https://www.nse-esgrating.com
17. Padhi, A., & Mishra, S. (2025). Assessing the impact of ESG factors on sustainable finance in India: A random forest regression approach. International Journal of Environmental Sciences, 11(15s), 1249–1265. https://doi.org/10.64252/0exb4216
18. Patel, R., & Desai, K. (2024). Sustainable financial strategies for responsible business growth. Global Journal of Business and Finance, 2(1), 63. https://doi.org/10.59613/global.v2i1.63
19. Prodanova, N., & Tarasova, O. (2023). The impact of ESG principles on company profit. Cadernos de Educação, Tecnologia e Sociedade, 16(3), 685–696. https://doi.org/10.14571/brajets.v16.n3.685-696
20. Rao, A., Dagar, V., Sohag, K., Dagher, L., & Tanin, T. I. (2023). ESG impact on financial performance in India. Finance Research Letters, 56, 104093.
21. Rao, P., & Kulkarni, S. (2022). Relationship between ESG and corporate financial performance: A systematic review. MAJ Cafe, 32. https://doi.org/10.60016/majcafe.v32.22
22. Sairam, A., & Sairam, A. (2025). Investor–sustainability–performance nexus: Evidence from ESG-compliant firms in India. International Journal for Multidisciplinary Research, 7(5). https://doi.org/10.36948/ijfmr.2025.v07i05.56809
23. Singhania, M., Chadha, G. K., & Prasad, R. P. (2023). Sustainable finance research: Review and agenda. International Journal of Finance & Economics. https://doi.org/10.1002/ijfe.2854
24. Weber, O. (2014). The financial sector's impact on sustainable development. Journal of Sustainable Finance & Investment, 4(1), 1–8. https://doi.org/10.1080/20430795.2014.887345
25. Wu, Y. (2025). ESG disclosure regulations: Corporate implementation and challenges. Journal of Global Trends in Social Science, 2(1). https://doi.org/10.70731/wm839928

26. Zhytar, M. (2025). Global trends and challenges in ESG standards implementation. Financial and Credit Systems Prospects for Development, 1(16), 33–42. https://doi.org/10.26565/2786-4995-2025-1-03