

ESG Index Membership and Cost of Capital: Evidence from Nifty100 ESG and Matched Non-ESG Firms in India (2021–2024)

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Abstract

This paper tests whether membership in India's Nifty100 ESG index is linked with a lower weighted average cost of capital. Prior Indian studies link ESG disclosure scores to cost of debt or cost of equity separately. This study uses index membership, an objective measure, and tests full WACC as the outcome. A sample of 20 Nifty100 ESG constituents and 20 non-index peers, matched on sector, over 2021–2024 is used as data for the study. WACC is built from CAPM cost of equity and after-tax cost of debt for 159 firm-year observations. An independent-samples t-test finds no significant difference in mean WACC between ESG and non-ESG firms (10.25% versus 10.31%, $p = 0.895$). A paired t-test on matched pairs confirms this ($p = 0.910$). An OLS regression controlling for firm size and leverage also finds no significant ESG effect ($p = 0.615$), although size and leverage are both strong, significant predictors of WACC. The results suggest that any apparent cost-of-capital benefit for ESG-index firms in India is explained by their size and capital structure and not by ESG status itself.

Keywords: ESG, Cost of Capital, WACC, Nifty100 ESG Index, India, Capital Structure.

1. Introduction

Corporate finance theory holds that a firm's cost of capital reflects its risk. Environmental, social, and governance (ESG) performance is increasingly proposed as a risk factor that lenders and investors consider. If ESG-strong firms are seen as lower risk, they should raise capital more cheaply. This idea has been tested across markets, most influentially by El Ghoul et al. (2011), who found that stronger corporate social responsibility

(CSR) scores lower the cost of equity in United States firms.

India offers a distinct setting to test this idea. The Securities and Exchange Board of India (SEBI) made ESG disclosure (Business Responsibility and Sustainability Reporting, or BRSR) mandatory for the top 1,000 listed firms by market capitalisation from FY2022–23. The National Stock Exchange also runs ESG-screened indices, including the Nifty100 ESG index, which selects firms from the Nifty100 based on ESG scores alongside size.

Existing India-specific studies link continuous ESG disclosure scores to cost of debt, cost of equity, or leverage, generally in isolation and using self-constructed or vendor scores. This leaves two gaps: no study uses index membership itself, a binary, market-verified treatment, and no study tests full WACC, the measure firms actually use in capital budgeting decisions. This paper fills both gaps. It compares WACC between Nifty100 ESG constituents and matched non-index firms over 2021–2024, controlling for firm size and leverage.

2. Literature Review

The relationship between ESG or CSR performance and cost of capital has been studied globally. El Ghoul et al. (2011) is the founding study, showing that United States firms with higher CSR scores enjoy a lower cost of equity, because of reduced perceived risk and better investor relations. Dhaliwal et al. (2011) extend

this by showing that firms with a high cost of equity are more likely to begin voluntary CSR disclosure, and that disclosure subsequently lowers their cost of equity, reflecting a two-way relationship.

Sharfman and Fernando (2008) isolate the environmental part and find that better environmental risk management shifts financing toward fixed income securities and lowers overall cost of capital. Ng and Rezaee (2015) decompose sustainability performance into economic, environmental, social, and governance components, showing each affects cost of equity differently.

In emerging markets, the evidence is mixed. Lavin and Montecinos-Pearce (2022) find ESG disclosure lowers cost of debt in Chilean firms. Lynch and O'Hagan-Luff (2024) show that ESG performance relative to industry peers matters more than absolute score, a distinction relevant to the current study.

India-specific evidence has grown since SEBI's BRSR mandate. Chakrabarti and Gupta (2025) use a regression discontinuity design around five ESG disclosure events and find mandated firms' stock prices fell 7–8% overall, but rose in ESG-material industries. Malik and Kashiramka (2025) show higher ESG disclosure is associated with lower leverage, while Malik and Kashiramka (2024) link ESG disclosure to lower cost of debt in Indian firms. Mathath, Kumar and Balasubramanian (2024) find ESG disclosure lowers cost of debt more in the growth and mature stages of a firm's life cycle than in the introduction, decline, or shakeout stages. Prasad et al. (2022) find regulatory intervention strengthens the CSR–cost of capital relationship. Malik, Kashiramka and Sharma (2026) further show that ESG disclosure shapes the mix of debt

and equity financing among Indian firms, reinforcing the link between ESG and capital structure decisions.

Two patterns recur across this literature: most studies use continuous, self-constructed ESG scores rather than objective index membership, and most examine cost of debt or equity separately rather than blended WACC. This paper addresses both these gaps.

3. Research Objectives / Hypotheses

This study has the following objectives:

1. To check whether firms in the Nifty100 ESG index have a lower cost of capital than similar non-ESG firms.
2. To see if this difference still holds after adjusting for firm size and leverage.
3. To compare the findings with earlier studies on ESG and cost of capital in India.

Based on these objectives, the study tests the following hypothesis:

H1: Firms that are part of the Nifty100 ESG index have a lower cost of capital (WACC) than firms that are not part of the index.

4. Research Methodology

The sample consists of 20 Nifty100 ESG index constituents, drawn from the current index factsheet, matched to 20 non-index firms from the broader NSE universe on sector and approximate size. This yields 40 firms and, over four fiscal years (2021–2024), 159 usable firm-year observations. One observation (Hindustan Unilever, 2021) is excluded because zero reported total debt against non-zero interest expense makes cost of debt undefined. Matching was performed within the same NSE sector classification, selecting the non-index firm

closest in current market capitalisation to each ESG constituent, subject to confirmation that the matched firm was not itself a Nifty100 ESG constituent.

Financial data — total debt, interest expense, effective tax rate, total assets — are collected from Screener.in filings. Beta is collected from Moneycontrol.com. The risk-free rate is the 10-year Indian government bond (G-Sec) yield at each fiscal year-end, verified against Investing.com data. Expected market return is set at a stable long-run estimate of 12%, consistent with standard equity risk premium practice for India. This 12% figure reflects a long-run equity risk premium of approximately 5–6% added to the average risk-free rate over the sample period, following Damodaran-style emerging-market premium estimates, rather than each year's realised Nifty 50 return, which is too volatile for a stable CAPM input.

Cost of equity is estimated using the Capital Asset Pricing Model (CAPM):

$$K_e = R_f + \beta (R_m - R_f)$$

where R_f is the risk-free rate, β is firm beta, and R_m is expected market return. After-tax cost of debt is interest expense divided by total debt, multiplied by one minus the effective tax rate.

WACC weights cost of equity and after-tax cost of debt by market value of equity and total debt.

The main test compares mean WACC between groups using an independent-samples t-test and a paired t-test on the 20 matched pairs. Because ESG-index membership correlates mechanically with firm size, an OLS regression is also estimated:

$$WACC_{i,t} = \beta_0 + \beta_1 ESG_i + \beta_2 \ln(Assets)_{i,t} + \beta_3 Leverage_{i,t} + \epsilon_{i,t}$$

where ESG is a dummy for index constituents, $\ln(Assets)$ is the natural log of total assets, and Leverage is the market-value weight of debt in total capital. Heteroscedasticity-robust (HC1) standard errors are used, with fiscal-year fixed effects as a robustness check.

5. Data Analysis and Interpretation

Table 1 summarises the results. The unconditional group means are close. ESG firms average a WACC of 10.25%, against 10.31% for control firms, a difference of only 0.06 percentage points. The independent-samples t-test fails to reject the null of equal means ($t = -0.13$, $p = 0.895$). The paired t-test, which compares each ESG firm to its matched sector peer directly, gives the same conclusion ($t = -0.11$, $p = 0.910$).

Measure	ESG Group	Control Group
Mean WACC (%)	10.25	10.31
Mean Cost of Equity (%)	12.33	12.90
Mean Total Assets (₹ Cr)	783,347	205,895
n (firm-years)	79	80

Table 1. Group means, 2021–2024 pooled sample.

The size gap between groups is large. ESG firms average roughly ₹783,000 crore in total assets against ₹206,000 crore for control firms, a 3.8 times difference. This reflects the link between market-cap-weighted index construction and firm size, not a deliberate feature of the sample design.

Table 2 reports the regression results. Once size and leverage are controlled for, the ESG dummy remains statistically insignificant (coefficient = -0.127 , $p = 0.615$). Log of total assets is negative and significant (coefficient = -0.616 , $p = 0.004$). Larger firms have lower WACC, consistent with economies of scale in financing and lower

perceived default risk. Leverage is also negative and strongly significant (coefficient = -7.186 , $p < 0.001$), signifying that debt is cheaper than equity on average. The model explains 74.1% of the variation in WACC ($R^2 = 0.741$). Adding fiscal-year fixed effects does not change these conclusions; the ESG coefficient remains insignificant ($p = 0.630$). Year fixed effects absorb common macroeconomic shocks, such as interest-rate movements across 2021–2024, that could otherwise be mistaken for a genuine ESG effect if they coincided with shifts in index composition.

Variable	Coefficient	Std. Error	p-value
Intercept	15.407	0.951	0.000
ESG dummy	-0.127	0.254	0.615
ln(Total Assets)	-0.616	0.215	0.004**
Leverage (Wd)	-7.186	0.561	0.000***

Table 2. OLS regression, dependent variable WACC (%). $n = 159$, $R^2 = 0.741$. Robust (HC1) standard errors. ** $p < 0.01$, *** $p < 0.001$.

6. Results and Discussion

These results generate a different picture from the group-mean comparison alone. An upfront reading of Table 1 might suggest ESG firms enjoy a small cost-of-capital advantage. The regression shows this is not really an ESG effect: it is a size and leverage effect. ESG-index firms are larger and carry a different capital structure than their non-index peers, and both of those characteristics independently lower WACC. Once accounted for, ESG-index status itself adds nothing statistically significant.

This finding contrasts with several papers reviewed above. [El Ghouli et al. \(2011\)](#) and [Dhaliwal et al. \(2011\)](#) both find a genuine CSR effect on cost of equity in the United States. The

India-specific studies of [Malik and Kashiramka \(2025\)](#) and the disclosure-based cost-of-debt literature also report significant ESG effects. One explanation for the divergence is methodological: continuous scores may capture within-group variation that a binary index-membership treatment cannot. Unlike this study, most of the papers reporting a significant ESG–cost of capital relationship do not explicitly control for firm size, so part of their reported effect may reflect the same size confound identified here rather than ESG performance itself. Further, [Lynch and O'Hagan-Luff's \(2024\)](#) point that relative, not absolute, ESG standing matters suggests index membership may be too coarse a measure to detect this.

7. Practical / Managerial Implications

Being part of an ESG index alone does not seem to lower a firm's cost of capital. Managers should not assume that joining an ESG index will automatically reduce financing costs. Firm size and capital structure appear to matter more than ESG status in lowering WACC. Investors and lenders in India may be pricing firms based on size and leverage, not ESG performance alone. Policymakers promoting ESG adoption may need to highlight other benefits, since a lower cost of capital is not guaranteed.

8. Conclusion

This paper tests whether Nifty100 ESG index membership lowers the cost of capital for Indian listed firms. Using a matched sample of 20 pairs over 2021–2024, it finds no statistically significant difference in WACC between ESG-index and non-index firms, either unconditionally or after controlling for firm size and leverage. The apparent cost-of-capital advantage of ESG-index firms is explained by their size and capital structure rather than by ESG status itself. This result complicates the view, common in prior literature, that ESG performance independently lowers financing costs, and suggests that future India-focused studies should control carefully for the size confound inherent in index-based ESG measures.

9. Limitations of the Study

With reference to the current study, three limitations should be noted.

First, the sample of 20 matched pairs is small; a true but modest ESG effect could exist without being statistically detectable at this sample size. With only 20 matched pairs, the study is likely underpowered to detect small or moderate effect sizes, and the non-significant ESG coefficient

should therefore be read as inconclusive rather than as definitive evidence of no relationship.

Second, beta is held constant across the four-year window for each firm, a common simplification given the absence of free point-in-time beta data for the full sample. This simplification is standard for large, established firms whose systematic risk changes slowly, and because beta is held constant identically across both groups, it is unlikely to bias the ESG-versus-control comparison, though it may understate genuine year-to-year variation in each firm's cost of equity.

Third, a small number of firms have data irregularities: Tata Motors underwent a 2025 corporate demerger affecting continuity of its market data, and ICICI Prudential Life's balance sheet is dominated by policyholder liabilities rather than conventional interest-bearing debt. These are noted rather than excluded, since exclusion would reduce an already small sample further.

10. Future Research Directions

Future studies can use a larger sample of firms to get more reliable results. Researchers can calculate beta separately for each year instead of keeping it constant. Future work can also use continuous ESG scores instead of just index membership. Studies covering a longer time period may show whether the ESG effect changes as more regulations are introduced in India.

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