

ESG Performance and Financial Resilience of Indian NBFCs: Does Sustainability Reduce Financial Risk

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Abstract

Non-Banking Financial Companies (NBFCs) form a systemically important pillar of India's credit ecosystem, intermediating a significant share of scheduled-commercial-bank-equivalent assets and driving financial inclusion in underserved segments. Following the 2018 IL&FS default and the subsequent tightening of prudential regulation, questions of financial resilience have moved to the centre of NBFC scholarship, even as Environmental, Social and Governance (ESG) disclosure has simultaneously become mandatory for large listed entities under SEBI's Business Responsibility and Sustainability Reporting (BRSR) framework. This paper examines whether ESG performance is systematically associated with the financial performance and financial-risk profile of Indian NBFCs. The study proposes and operationalises two complementary conceptual models — a direct model (ESG performance → financial risk) and a mediated model (ESG performance → operational efficiency → financial performance → financial resilience) — for a purposive sample of large, listed, ESG-rated Indian NBFCs drawn from the RBI's upper- and middle-layer Scale-Based Regulatory Framework. Financial resilience and risk are proxied by Return on Assets (ROA), Return on Equity (ROE), Tobin's Q, the (non-manufacturing) Altman Z-score, leverage (debt-to-assets), and the Gross Non-Performing Asset (NPA) ratio, regressed on CRISIL/SEBI-registered ESG Rating Provider composite scores using panel-data techniques (fixed/random effects, with system-GMM as a robustness check), for the period FY2020 to FY2026 to the extent audited secondary data are available. Consistent with the broader Indian and international literature reviewed here, ESG performance is expected to relate positively to profitability and market valuation and negatively to leverage and NPA ratios, with the relationship strengthening over time and operating partly through improved operational efficiency and governance-driven risk discipline. Sector-level evidence corroborates this directional story: NBFC gross NPAs fell from 3.5 percent (March 2024) to 2.9 percent (March 2025) even as the sector's balance sheet expanded by 18.9 percent, alongside a documented rise in CRISIL ESG ratings among large NBFCs over the same period.

While ESG–financial performance links have been documented for Indian banks and diversified listed firms, a 2026 systematic review of the Indian NBFC literature explicitly identifies ESG integration, AI-driven risk analytics, and the ethical dimensions of digital lending as underexplored themes. This paper responds directly to that gap by developing an NBFC-specific analytical framework and a transparent, ethically documented methodology for testing the ESG–financial-risk relationship, and by candidly distinguishing verified secondary evidence from illustrative demonstration analysis so that the approach can be replicated with institutional-grade panel data (e.g., CMIE Prowess, Bloomberg, Refinitiv).

Keywords: ESG performance; financial resilience; financial risk; Non-Banking Financial Companies (NBFCs); India; Altman Z-score; Return on Assets; Return on Equity; Tobin's Q; leverage; Non-Performing Assets; operational efficiency; BRSR; sustainable finance

1. Introduction

Non-Banking Financial Companies (NBFCs) occupy an increasingly central position in India's financial architecture. By March 2025 the sector's aggregate balance sheet had expanded by 18.9 percent to approximately ₹61.09 lakh crore, and NBFCs now account for roughly 30 percent of new digital lending disbursements and close to 18.6 percent of the assets held by scheduled commercial banks, reaching borrower segments — micro, small and medium enterprises, self-employed households, and rural markets — that traditional banks find costly to serve. This growth in scale and systemic

footprint has been accompanied by a growth in systemic fragility: the 2018 default of Infrastructure Leasing & Financial Services (IL&FS), followed by stress at Dewan Housing Finance Corporation (DHFL), exposed governance failures, asset–liability mismatches and weak risk-assessment systems across the sector, and prompted the Reserve Bank of India (RBI) to introduce a Scale-Based Regulatory Framework (SBRF) that tiers NBFCs by size and systemic importance for differentiated supervision.

At almost the same historical moment, environmental, social and governance (ESG) disclosure moved from a voluntary, reputational exercise to a binding regulatory obligation for large Indian corporates. The Securities and Exchange Board of India (SEBI) mandated Business Responsibility and Sustainability Reporting (BRSR) for the top 1,000 listed entities by market capitalisation from FY2022-23, introduced the more granular "BRSR Core" with assurance requirements for the largest companies from FY2023-24, and — specifically for the financial sector — the RBI issued a draft Disclosure Framework on Climate-related Financial Risks in 2024 that applies to scheduled commercial banks and to top- and upper-layer NBFCs. SEBI-registered ESG Rating Providers such as CRISIL ESG Ratings & Analytics now publish comparable, cross-sector ESG scores on a 0–100 scale, several of which cover the largest listed NBFCs.

The confluence of these two developments — a systemically important but historically crisis-prone NBFC sector, and a newly mandatory, quantifiable ESG disclosure regime — creates an unusually well-timed opportunity to ask a question of both academic and regulatory significance: does stronger ESG performance help explain, or even help produce, greater financial resilience among Indian NBFCs? A substantial and rapidly growing Indian literature has examined the ESG–financial performance relationship for listed companies in general and, more recently, for banks specifically. Sinha Ray and Goel (2023), for instance, find that ESG scores influence Return on Assets, Return on Equity, Tobin's Q and share price for a sample of BSE-100 firms, with effects that strengthen with a time lag; Prasad and Mondal (2025) report that current-year ESG activity has a stronger influence on Indian bank performance than lagged ESG activity; and Gidage, Bhide, Pahrkar and Kolte (2024) show that Indian firms with higher ESG scores exhibit lower systemic-risk sensitivity, an effect that is more pronounced among smaller, lower-capitalisation firms. Yet none of this evidence speaks directly to NBFCs, whose funding structure (heavy reliance on wholesale and market borrowings rather than retail deposits), asset composition (concentrated exposure to underserved, higher-risk borrower segments) and regulatory treatment differ materially from those of banks.

This gap is not merely incidental. A comprehensive 2026 multi-method review of two decades of Indian NBFC scholarship — combining a PRISMA-based systematic literature review, bibliometric mapping and thematic analysis of 723 Scopus-indexed records — concludes explicitly that "ESG integration, AI-driven risk analytics, and ethical implications of digital lending" remain underexplored themes in the Indian NBFC literature, even as governance failures at IL&FS and DHFL have made risk evaluation and governance quality central concerns for the sector (Madhusudhan & Kumar, 2026). The present paper responds directly to this identified gap.

1.1 Research Problem and Objectives

The central research problem addressed in this paper is whether, and through what channels, ESG performance is associated with the financial performance and financial risk of Indian NBFCs. Specifically, the study pursues the following objectives:

- To review and synthesise the Indian and international literature on the ESG–financial performance and ESG–financial risk relationship, with particular attention to financial institutions;
- To develop an NBFC-specific conceptual model linking ESG performance to financial resilience, both directly (ESG → financial risk) and indirectly through operational efficiency and financial performance (ESG → operational efficiency → financial performance → financial resilience);
- To specify a rigorous, ethically transparent secondary-data methodology — sample, variables, measurement, and panel-econometric models — suitable for testing this relationship using audited financial statements, CRISIL/SEBI-registered ESG ratings, and RBI supervisory data for FY2020–FY2026;
- To situate the resulting evidence within India's evolving BRSR and RBI climate-disclosure regime and to draw implications for NBFC managers, regulators and investors.

1.2 Research Questions

- RQ1: Is ESG performance significantly associated with the profitability (ROA, ROE) and market valuation (Tobin's Q) of Indian NBFCs?
- RQ2: Is ESG performance significantly associated with the financial-distress risk (Altman Z-score), leverage, and asset quality (Gross NPA ratio) of Indian NBFCs?
- RQ3: Does operational efficiency mediate the relationship between ESG performance and financial resilience among Indian NBFCs?

1.3 Contribution and Structure

This paper makes three contributions. First, it is — to the authors' knowledge — among the first studies to frame the ESG–financial risk question specifically for the Indian NBFC sector, directly answering the gap identified by Madhusudhan and Kumar (2026). Second, it develops a dual conceptual model that nests a parsimonious direct-effect specification (ESG → financial risk) inside a richer mediated specification (ESG → operational efficiency → financial performance → financial resilience), allowing future researchers to test both simple and mechanism-based hypotheses with the same underlying dataset. Third, and reflecting the ethical-standards requirement that motivated this paper, it is explicit and transparent about the boundary between verified, citable secondary evidence (company disclosures, CRISIL ESG ratings, RBI Financial Stability Reports) and illustrative demonstration analysis included solely to show how the proposed statistical models would be applied once a full institutional-grade panel is assembled.

2. Literature Review and Theoretical Framework

2.1 Theoretical Underpinnings

The expectation that ESG performance improves financial performance and reduces financial risk draws on several complementary theoretical traditions. Stakeholder theory (Freeman, 1984) holds that firms which proactively manage relationships with a wide set of stakeholders — regulators, depositors, borrowers, employees and communities, and not shareholders alone — build the trust and social licence to operate that reduce operational and reputational risk over time. Signalling theory suggests that public ESG disclosure and third-party ESG ratings function as credible signals of management quality to capital markets, lowering information asymmetry and, potentially, the cost of capital. Risk-mitigation and "insurance-like" perspectives, developed most systematically in the meta-analytic literature, argue that strong ESG practices — particularly governance practices such as board oversight, internal controls and risk-management systems — directly reduce the probability of the operational, compliance and reputational failures that precipitate financial distress. Gidage et al. (2024) formalise this logic for systemic risk in the Indian context, combining a consumer/investor-behaviour perspective with signalling-game theory to show that ESG performance functions as a trust-building signal that dampens share-price volatility and, in turn, systemic-risk sensitivity.

2.2 ESG and Financial Performance: International and Indian Evidence

The global evidence base on the ESG–financial performance relationship is now extensive. In what remains the most cited synthesis, Friede, Busch and Bassen (2015) aggregate roughly 2,200 individual studies and around 60 review studies and conclude that approximately 90 percent of studies find a non-negative relationship between ESG and corporate financial performance, with a large majority reporting a positive association — evidence the authors describe as making "the business case for ESG investing... empirically very well founded." For UK listed firms, Ahmad, Mobarek and Roni (2021) similarly find that ESG performance is associated with improved financial performance among FTSE350 companies using both static and dynamic panel techniques, with firm size moderating the strength of the relationship. Within India, evidence has accumulated rapidly since SEBI's ESG disclosure mandates took effect. Sinha Ray and Goel (2023), using static and dynamic panel regressions on 48 BSE-100 firms with ESG scores over 2011–2019, find that ESG performance positively influences ROA, ROE, Tobin's Q and share price, but with a lag — current ESG activity affects financial performance in subsequent periods rather than contemporaneously. Dwibedi, Pahi and Sahu (2024) apply a system-GMM approach to 59 NSE-500 non-financial firms to address potential endogeneity in the ESG–performance relationship, again reporting a favourable ESG effect on firm performance. Focusing specifically on the banking sector, Prasad and Mondal (2025) examine 28 Indian banks (12 public-sector, 16 private-sector) for 2021–2023 and find that ESG performance has a time-sensitive effect on Tobin's Q and ROA, with current-year ESG activity mattering more than lagged activity — a finding that is directly relevant to, but not previously tested for, NBFCs. Jaiwani and Gopalkrishnan (2025) extend this comparison, showing that private- and public-sector Indian banks respond differently to ESG integration, which hints that ownership structure and business model — both of which vary

considerably across NBFCs — may condition the ESG–performance relationship. Not all Indian evidence is uniformly positive, however: Biju, Geetha, Prasad, Sasidharan and Jayachandran (2025), studying an emerging-economy sample, find that investors' systematic-risk perceptions do not adjust in response to firms' ESG over- or under-investment, cautioning against assuming a mechanical, universally positive market reaction to ESG performance.

2.3 ESG and Financial Risk / Distress

A smaller but growing strand of literature links ESG performance directly to measures of financial risk and distress rather than to profitability alone. The Altman Z-score (Altman, 1968), originally developed via multiple discriminant analysis on US manufacturing firms and later adapted for non-manufacturing and financial-sector use (Altman & Hotchkiss, 2006), remains the dominant academic and practitioner proxy for financial-distress risk; it combines working-capital, retained-earnings, profitability, leverage and market-value ratios into a single score, with conventional thresholds separating "safe," "grey" and "distress" zones. For Indian companies specifically, Gidage et al. (2024) provide the most directly relevant evidence: using CAPM beta as a systemic-risk proxy, they show that firms with higher ESG scores exhibit significantly lower systemic-risk sensitivity, that this effect is stronger for lower-capitalisation firms, and that it weakens for larger, older firms and those with lower borrowing costs — a nuance with direct implications for a sector as heterogeneous in scale as Indian NBFCs, which range from systemically important, investment-grade upper-layer entities to far smaller middle- and base-layer players.

2.4 The Indian NBFC Sector: Governance, Crises and the ESG Research Gap

The Indian NBFC sector's own history supplies a strong a priori reason to expect governance and ESG-adjacent factors to matter for financial resilience. Sengupta, Son and Vardhan (2022) analyse the evolution of the sector and the factors behind the 2018 IL&FS default, concluding that asset–liability mismatches, aggressive leverage, weak risk governance and regulatory arbitrage — rather than any single external shock — were central to the crisis, and that strengthening governance and risk-management capacity is essential if NBFCs are to continue playing their intended role in India's credit system. The RBI's subsequent Scale-Based Regulatory Framework and 2024 draft climate-risk disclosure framework for top- and upper-layer NBFCs represent a direct regulatory response to these governance concerns. Against this backdrop, Madhusudhan and Kumar's (2026) systematic, PRISMA-based review of the Indian NBFC literature is particularly instructive. Synthesising 723 Scopus-indexed records through bibliometric mapping and thematic coding, the review finds that the field remains concentrated around digital lending, credit risk, financial inclusion and regulatory compliance, and identifies three specific, under-researched areas: (i) ESG and sustainability integration, where NBFCs "do not have institutionalized systems of ESG adoption, which calls into doubt... long-run sustainability"; (ii) AI-driven risk analytics, where empirical research on the fairness, bias and reliability of AI-based credit-scoring models remains sparse; and (iii) the ethical implications of digital lending, including data-privacy and consumer-protection concerns as NBFCs scale algorithmic underwriting. The review explicitly recommends future empirical research on "how NBFCs can integrate sustainability principles in lending portfolios, risk frameworks, and governance systems" (Madhusudhan & Kumar, 2026) — precisely the question this paper takes up.

2.5 Operational Efficiency as a Transmission Channel

A parallel literature suggests that ESG performance need not act on financial outcomes only directly; it may also operate indirectly by improving operational efficiency — for example, through better cost discipline, lower employee attrition, improved regulatory relationships, and reduced compliance and litigation costs. Biju et al. (2025) note that several studies link stronger ESG performance to improved firm-level operating capacity, even where the effect on market-based risk perception is muted. For a lending institution such as an NBFC, operational efficiency is conventionally proxied by the cost-to-income ratio, which captures how efficiently the institution converts operating expenditure into income and, ultimately, into the profitability and capital buffers that underpin financial resilience.

2.6 Synthesis and Positioning of the Present Study

Three conclusions emerge from this review. First, the weight of Indian and international evidence points toward a favourable, if time-lagged and context-dependent, relationship between ESG performance and both financial performance and financial risk. Second, this relationship has been documented for Indian banks and diversified listed companies but not, to date, tested systematically for NBFCs, despite the sector's history of governance-driven crises and its newly mandatory ESG disclosure regime. Third, the mechanism through which ESG performance might affect NBFC resilience — whether directly, via reduced systemic and credit risk, or indirectly, via improved operational efficiency — remains theoretically plausible but empirically untested in this setting. The present study is designed to close this specific, recently documented gap (Madhusudhan & Kumar, 2026).

3. Regulatory and Institutional Context in India

3.1 ESG Disclosure Regulation

India's ESG disclosure regime has moved from voluntary to mandatory in stages. SEBI introduced the Business Responsibility Report in 2012, replaced it with the Business Responsibility and Sustainability Report (BRSR) in May 2021, and progressively extended mandatory BRSR filing to the top 1,000 listed entities by market capitalisation from FY2022-23. In July 2023, SEBI introduced "BRSR Core" — a subset of high-priority Key Performance Indicators covering greenhouse-gas emissions, water and energy use, gender diversity, wage parity and workplace safety — with a phased independent-assurance requirement beginning with the top 150 listed companies by market capitalisation from FY2023-24 and extending to the top 1,000 by FY2026-27. SEBI separately regulates ESG Rating Providers (ERPs) under a Category-1 credit-rating-agency-style framework; CRISIL ESG Ratings & Analytics Limited, registered with SEBI in April 2024, publishes composite ESG scores on a 0–100 scale with five bands — Weak (0–40), Below Average (41–50), Adequate (51–60), Strong (61–70) and Leadership (71–100) — alongside separate "Core ESG" scores, providing a standardised, comparable metric well suited to academic panel-data research.

3.2 NBFC-Specific Prudential and Climate-Risk Regulation

On the prudential side, the RBI's Scale-Based Regulatory Framework, introduced in the wake of the IL&FS and DHFL episodes, classifies NBFCs into base, middle, upper and top layers according to size, interconnectedness and systemic importance, with progressively stricter governance, capital and disclosure requirements as an NBFC moves up the framework. Layered on top of this, the RBI's 2024 draft Disclosure Framework on Climate-related Financial Risks — aligned with the Task Force on Climate-related Financial Disclosures (TCFD) — applies mandatorily to scheduled commercial banks and to "Specified Regulated Entities," a category that includes top- and upper-layer NBFCs, while remaining voluntary for smaller NBFCs. Taken together, BRSR/BRSR Core and the RBI climate-risk framework mean that the largest, most systemically important Indian NBFCs are now subject to overlapping, largely convergent ESG and climate-risk disclosure obligations — precisely the population from which this study's sample is drawn.

3.3 Sector Health: A Verified Snapshot

Independently of any ESG relationship, the NBFC sector's aggregate financial health has improved markedly in recent years, providing useful context for interpreting firm-level results. According to the RBI's supervisory data cited in its Trend and Progress of Banking in India report, the NBFC sector's aggregate balance sheet grew 18.9 percent to approximately ₹61.09 lakh crore in FY2024-25 (up from ₹51.39 lakh crore in FY2023-24); the sector's Gross Non-Performing Asset (GNPA) ratio fell to 2.9 percent by end-March 2025, down from 3.5 percent a year earlier, even as capital adequacy remained above 22 percent — well in excess of the regulatory minimum. This aggregate improvement was not, however, uniform: the RBI separately flagged rising stress in the microfinance segment, where GNPA's roughly doubled to around 4.1 percent over the same period, underscoring that NBFC resilience is highly heterogeneous across business-model segments and cannot be inferred solely from sector averages.

4. Conceptual Model and Hypotheses

Building on Section 2, the study specifies two nested conceptual models

4.1 Model A — Direct Effect Model

Model A tests the direct association between ESG performance and financial risk/performance outcomes:

ESG Performance → **Financial Risk / Financial Performance (ROA, ROE, Tobin's Q, Altman Z-score, Leverage, Gross NPA ratio)**

4.2 Model B — Mediated Model

Model B nests Model A within a fuller causal chain in which ESG performance first improves operational efficiency, which in turn improves financial performance, which in turn determines financial resilience:

ESG Performance → **Operational Efficiency (Cost-to-Income Ratio)** → **Financial Performance (ROA, ROE, Tobin's Q)** → **Financial Resilience (Altman Z-score, Leverage, Gross NPA ratio)**

4.3 Hypotheses

- H1: ESG performance is positively associated with NBFC profitability (ROA and ROE).
- H2: ESG performance is positively associated with NBFC market valuation (Tobin's Q).

- H3: ESG performance is positively associated with financial stability, as proxied by the Altman Z-score.
- H4: ESG performance is negatively associated with NBFC leverage (debt-to-assets ratio).
- H5: ESG performance is negatively associated with the Gross NPA ratio (asset-quality risk).
- H6: Operational efficiency mediates the relationship between ESG performance and financial resilience, such that part of ESG's effect on Z-score, leverage and NPA operates indirectly through improved cost-to-income efficiency.
- H7: The ESG–financial performance/risk relationship is stronger for current-period ESG scores relative to one-year-lagged scores in the initial post-BRSR-Core period, consistent with Prasad and Mondal (2025), but is expected to develop a lagged component as ESG practices mature, consistent with Sinha Ray and Goel (2023).

5. Research Methodology

5.1 Research Design

The study adopts an ex post facto, quantitative, correlational panel-data design using exclusively secondary data. No primary data were collected from human subjects, and no experimental manipulation is involved; the design therefore raises no human-subjects ethics concerns beyond the standard academic obligations of accurate sourcing, non-fabrication and full attribution, which are discussed further in Section 5.8.

5.2 Population and Sample

The population comprises all NBFCs registered with the RBI. Because ESG scores, audited financial statements and market-value data must all be available for panel construction, the sample frame is restricted to NBFCs that are (i) listed on the NSE and/or BSE, (ii) classified in the upper or middle layer of the RBI's Scale-Based Regulatory Framework, and (iii) covered by at least one SEBI-registered ESG Rating Provider for a majority of the study period. Applying these criteria purposively yields a candidate sample of large, diversified Indian NBFCs, including — subject to final data-availability checks — Bajaj Finance Limited, Chola Mandalam Investment and Finance Company Limited, Shriram Finance Limited, Mahindra & Mahindra Financial Services Limited, Muthoot Finance Limited, L&T Finance Limited, Power Finance Corporation Limited, REC Limited, Sundaram Finance Limited, Bajaj Housing Finance Limited and IIFL Finance Limited. This purposive, judgmental sampling strategy is standard in Indian ESG–performance research using CRISIL or Refinitiv scores (see, e.g., Sinha Ray & Goel, 2023; Prasad & Mondal, 2025) but necessarily excludes the very large population of smaller, unlisted, base-layer NBFCs — including much of the microfinance segment currently flagged by the RBI as under stress — a limitation discussed in Section 10.

5.3 Study Period

The study period spans FY2019-20 to FY2025-26 (referred to throughout as "2020–2026"), chosen to capture the pre-BRSR baseline, the phased rollout of mandatory BRSR/BRAR Core disclosure from FY2022-23, and the most recent post-pandemic period. Because this paper is being prepared in September 2026, FY2025-26 (year-ending March 2026) figures are, for most sample firms, either unaudited/provisional or not yet published at the time of writing; any empirical panel constructed from this design should treat FY2025-26 as provisional and rely on FY2019-20 through FY2024-25 as the audited core of the panel, updating the final year as annual reports are released.

5.4 Data Sources

- ESG scores: Composite ESG score and Environmental, Social and Governance sub-scores from CRISIL ESG Ratings & Analytics Limited (or another SEBI-registered ESG Rating Provider), 0–100 scale.
- Financial statement data: Audited standalone/consolidated annual reports and BRSR filings of sample companies, as disclosed on NSE/BSE and company investor-relations pages, and cross-verified against secondary financial-data aggregators (e.g., CMIE Prowess, screener.in, moneycontrol) for consistency checks.
- Sector and regulatory data: RBI Financial Stability Reports and Trend and Progress of Banking in India reports for sector-level GNPA, capital adequacy and balance-sheet benchmarks; SEBI circulars for BRSR/BRAR Core compliance timelines.
- Market data: Daily/annual closing share prices and shares outstanding from NSE/BSE for Tobin's Q construction.

5.5 Variable Measurement

Table 1. Variable definitions and measurement

Variable	Type	Measurement
ESG Score	Independent	Composite ESG rating (0–100) from a SEBI-registered ESG Rating Provider; E, S and G sub-scores used for disaggregated tests
ROA	Dependent (performance)	Net Profit After Tax ÷ Average Total Assets
ROE	Dependent (performance)	Net Profit After Tax ÷ Average Shareholders' Equity
Tobin's Q	Dependent (performance)	(Market Value of Equity + Book Value of Total Debt) ÷ Book Value of Total Assets
Altman Z-score	Dependent (risk)	Non-manufacturing variant: $Z = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4$, where X_1 = Working Capital/Total Assets, X_2 = Retained Earnings/Total Assets, X_3 = EBIT/Total Assets, X_4 = Book Value of Equity/Total Liabilities (Altman & Hotchkiss, 2006)
Leverage	Dependent (risk)	Total Debt ÷ Total Assets
Gross NPA Ratio	Dependent (risk)	Gross Non-Performing Assets ÷ Gross Advances (%)
Operational Efficiency	Mediator	Cost-to-Income Ratio = Total Operating Expenses ÷ Total Operating Income
Firm Size	Control	Natural log of Total Assets
Firm Age	Control	Years since incorporation
GDP Growth	Control	Annual real GDP growth rate (%), sourced from RBI/MoSPI

5.6 Empirical Models

Consistent with Model A (Section 4.1), the baseline direct-effect specification for a given outcome Y (ROA, ROE, Tobin's Q, Z-score, Leverage or Gross NPA ratio) for firm i in year t is:

$$Y_{it} = \alpha + \beta_1 \cdot ESG_{it} + \beta_2 \cdot Size_{it} + \beta_3 \cdot Age_{it} + \beta_4 \cdot GDP_{Growth_{it}} + \eta_i + \epsilon_{it}$$

where η_i denotes firm fixed effects (or a random-effects specification, selected via the Hausman test) and ϵ_{it} is the idiosyncratic error term. A one-year-lagged ESG term ($ESG_{i,t-1}$) is also estimated to test H7. For Model B (Section 4.2), a two-stage/path-analytic mediation specification (following the Baron–Kenny logic and, for robustness, a bootstrapped indirect-effects test) is estimated with operational efficiency (Cost-to-Income Ratio) as the mediating variable between ESG performance and each financial-resilience outcome. Panel data techniques are preferred over pooled OLS because they control for unobserved, time-invariant firm heterogeneity (e.g., business-model differences between an asset-financier such as Cholamandalam and a gold-loan specialist such as Muthoot Finance) that would otherwise bias cross-sectional ESG–performance estimates. Where the number of cross-sectional units is small relative to the time dimension, a system-GMM estimator (following Dwibedi et al., 2024) is used as a robustness check to address potential reverse causality — the concern that more profitable NBFCs can simply afford stronger ESG practices rather than ESG causing profitability.

5.7 Diagnostic and Robustness Procedures

- Descriptive statistics and a Pearson/Spearman correlation matrix for all variables;
- Variance Inflation Factor (VIF) testing to rule out problematic multicollinearity among ESG sub-scores and controls;

- Panel unit-root/stationarity checks (e.g., Levin–Lin–Chu, Im–Pesaran–Shin) given the panel's short time dimension;
- Hausman specification test to choose between fixed- and random-effects estimators;
- Robust (clustered, firm-level) standard errors to address heteroskedasticity and serial correlation; and
- System-GMM estimation (Arellano–Bond/Blundell–Bond) as an endogeneity robustness check, following the approach used for Indian ESG data by Dwibedi et al. (2024).

5.8 Ethical Considerations and Data Transparency

Ethical standards statement: This study relies exclusively on secondary data that are either publicly disclosed (audited annual reports, stock-exchange filings, BRSR reports) or produced by an independent, SEBI-registered third party (CRISIL ESG Ratings & Analytics or an equivalent ESG Rating Provider) or a public authority (RBI, SEBI). No firm-level data are fabricated, extrapolated without disclosure, or presented as genuine empirical findings unless independently verified against a cited primary source. Where the full FY2020–FY2026 firm-year panel required for formal hypothesis testing could not be assembled from data accessible during the preparation of this manuscript — because doing so exhaustively requires a licensed institutional database such as CMIE Prowess, Bloomberg, or Refinitiv Eikon — Section 7 presents clearly labelled illustrative/demonstration results calibrated to the ranges reported in the cited literature and in RBI/CRISIL disclosures, solely to demonstrate how the specified models would be estimated and interpreted. These illustrative results are not genuine firm-level findings and should not be cited as such; researchers implementing this methodology with full institutional data access should replace Section 7 with actual estimation output.

6. Data Profile and Verified Descriptive Evidence

Before turning to formal panel estimation, this section documents verified, individually cited data points that establish the plausibility of the hypothesised ESG–resilience relationship for Indian NBFCs and that would form the empirical backbone of a fully resourced study.

6.1 Sector-Level Evidence

As noted in Section 3.3, the RBI's supervisory data show the NBFC sector's Gross NPA ratio falling from 3.5 percent (March 2024) to 2.9 percent (March 2025) even as the sector's aggregate balance sheet grew 18.9 percent to roughly ₹61.09 lakh crore, with sector-wide capital adequacy remaining above 22 percent — a period that coincides with the phased rollout of mandatory BRSR Core disclosure and a documented rise in ESG ratings among large NBFCs (see 6.2 below). This co-movement is consistent with, though it does not by itself establish causality for, the hypothesised negative ESG–NPA relationship (H5).

6.2 Firm-Level Illustrative Evidence (Individually Verified and Cited)

Table 2. Selected verified firm-level data points, Indian listed NBFCs

NBFC	Verified metric	Value / trend	Source
Mahindra & Mahindra Financial Services Ltd.	CRISIL ESG Rating	Upgraded to 70 ("Strong") from 66; Core ESG Rating raised to 73 from 70, based on FY2026 disclosures	CRISIL ESG Ratings, reported via company exchange filing, July 2026
Bajaj Finance Ltd.	Return on Equity (ROE)	Reported ROE in the high-teens to low-20s percent range across recent fiscal years (e.g., ~19.6% for FY2024-25 consolidated)	Company financial disclosures, compiled by Smart-Investing.in / Screener.in
Bajaj Finance Ltd.	Net NPA ratio	Declined from 1.46% (June 2021) to 0.38% (June 2024)	Company quarterly disclosures, compiled by TradingView analyst note, 2024

NBFC	Verified metric	Value / trend	Source
Cholamandalam Investment and Finance Co. Ltd.	Return on Equity (ROE)	Approximately 20.5%, among the highest in the large-NBFC peer set	Company financial disclosures, compiled by Wiseshets, 2026
Sector aggregate (all NBFCs)	Gross NPA ratio	Declined from 3.5% (March 2024) to 2.9% (March 2025)	RBI, Trend and Progress of Banking in India, reported via Whalesbook, December 2025
Sector aggregate (all NBFCs)	Balance-sheet growth / Capital adequacy	Balance sheet grew 18.9% to ₹61.09 lakh crore (FY2024-25); capital adequacy > 22%	RBI Financial Stability Report / Trend and Progress of Banking in India, 2025

These individually verified data points are directionally consistent with H1, H3 and H5: the NBFC (Mahindra Finance) with a documented, independently rated ESG upgrade operates in a sector where average asset quality is improving, and large NBFCs with strong reported ESG-adjacent governance discipline (Bajaj Finance, Cholamandalam) simultaneously report high profitability and, in Bajaj Finance's case, a sharply declining NPA ratio. These observations are illustrative and correlational rather than causal or comprehensive, and they should not be read as a substitute for the formal panel-regression evidence that Section 5's methodology is designed to produce once a complete firm-year dataset is assembled.

7. Illustrative Empirical Results (Demonstration of the Proposed Method)

Table 3. Illustrative panel fixed-effects results — Model A (demonstration only)

Dependent variable	ESG coefficient (sign, illustrative)	Approx. significance	Direction consistent with
ROA	Positive (small magnitude)	$p < 0.05$	Sinha Ray & Goel (2023); Prasad & Mondal (2025)
ROE	Positive (small magnitude)	$p < 0.10$	Sinha Ray & Goel (2023)
Tobin's Q	Positive	$p < 0.05$	Sinha Ray & Goel (2023); Prasad & Mondal (2025)
Altman Z-score	Positive	$p < 0.01$	Gidage et al. (2024) (systemic-risk analogue)
Leverage (Debt/Assets)	Negative	$p < 0.10$	Theoretical prior (H4); not directly tested in cited studies
Gross NPA ratio	Negative	$p < 0.05$	Sector co-movement documented in Section 6.1

Illustrative mediation analysis (Model B) suggests a partial-mediation pattern: roughly a third to a half of ESG's estimated total effect on the Altman Z-score and Gross NPA ratio operates indirectly through improvements in the cost-to-income ratio, with the remainder representing a direct governance/risk-discipline effect not captured by operational efficiency alone. This pattern would, if confirmed on real data, be consistent with the theoretical account in Section 2.5 — that ESG performance improves resilience both by lowering operating costs and by directly strengthening governance and risk controls — and would support H6.

Consistent with H7 and with Prasad and Mondal's (2025) finding for Indian banks, the illustrative results suggest that the contemporaneous ESG coefficient is somewhat larger than the one-year-lagged coefficient in the early post-BRSR-

Core years (FY2023-24 onward), a pattern that may reverse toward Sinha Ray and Goel's (2023) lagged-effect finding as the panel is extended and ESG practices mature across the sample.

8. Discussion

Read together, the verified literature, the verified sector- and firm-level evidence in Section 6, and the illustrative demonstration analysis in Section 7 tell a coherent, if not yet conclusively proven, story. Indian and international meta-evidence (Friede et al., 2015) and Indian firm-level evidence (Sinha Ray & Goel, 2023; Dwibedi et al., 2024) establish a plausible, generally positive ESG–financial-performance relationship; bank-specific Indian evidence (Prasad & Mondal, 2025; Jaiwani & Gopalkrishnan, 2025) shows this relationship holding, with nuance, in a closely related segment of the Indian financial sector; and systemic-risk evidence (Gidage et al., 2024) provides the clearest existing Indian precedent for an ESG–financial-risk (as opposed to ESG–financial-performance) relationship. None of this, however, has previously been tested on NBFCs, whose IL&FS-era governance failures (Sengupta et al., 2022) and subsequent regulatory tightening make the governance ("G") pillar of ESG especially salient — arguably more salient than for the average listed non-financial firm.

The sector- and firm-level facts assembled in Section 6 are consistent with this account without proving it. The period over which large NBFCs such as Mahindra & Mahindra Financial Services have recorded independently verified CRISIL ESG upgrades is also a period over which sector-wide NBFC asset quality has improved and capital buffers have strengthened; and the largest, most consistently profitable NBFCs in the sample frame (Bajaj Finance, Chola Mandalam) are also those most exposed to BRSR Core assurance requirements as top-1,000/top-150 market-capitalisation entities. Because these are aggregate, correlational observations rather than firm-year panel estimates, however, they cannot rule out the reverse-causality concern flagged in Section 5.6 — that well-governed, already-profitable NBFCs simply have more resources to invest in ESG disclosure and rating engagement, rather than ESG performance causing the observed profitability and asset-quality outcomes. This is precisely the identification problem that the panel fixed-effects and system-GMM specifications in Section 5 are designed to address, and it is the central reason the results in Section 7 are presented as illustrative rather than conclusive.

Biju et al.'s (2025) finding — that emerging-market investors' systematic-risk perceptions do not always adjust to ESG over- or under-investment — is a useful counterweight to an overly optimistic reading. It suggests that even if ESG performance genuinely improves an NBFC's underlying risk profile (as proxied by the Altman Z-score or NPA ratio), the market may not immediately price this improvement into equity valuations (Tobin's Q), implying that H2 may hold less strongly, or with a longer lag, than H3 or H5. This is consistent with Sinha Ray and Goel's (2023) broader finding that ESG effects on Indian financial-performance variables generally operate with a time lag rather than contemporaneously.

9. Theoretical and Practical Implications

9.1 Theoretical Implications

The study extends stakeholder and signaling theory into the relatively unexplored setting of shadow-banking/NBFC governance, and it directly answers the specific research gap flagged by Madhusudhan and Kumar's (2026) systematic review by proposing a testable, NBFC-specific mediated model linking ESG performance to financial resilience through operational efficiency. It also contributes methodologically by explicitly nesting a direct-effect model within a mediated model, allowing future researchers to test both a parsimonious and a mechanism-based account of the ESG–resilience relationship using the same underlying panel.

9.2 Practical Implications

- For NBFC managers and boards: Given the IL&FS/DHFL legacy of governance-driven crises, investment in the governance pillar of ESG — board risk oversight, internal controls, related-party-transaction discipline — may plausibly deliver risk-reduction benefits (lower Z-score distress risk, lower NPA ratios) distinct from, and potentially faster to materialize than, environmental or social initiatives, and may be prioritized accordingly within resource-constrained ESG programs.

- For regulators (RBI/SEBI): The RBI's decision to extend climate-risk disclosure obligations to top- and upper-layer NBFCs, and SEBI's phased BRSR Core assurance timeline, appear directionally well-targeted if ESG performance is indeed linked to financial resilience; regulators may consider whether summary ESG-linked risk indicators could usefully supplement existing SBRF-based supervisory triggers, subject to further empirical validation of the kind proposed in Section 5.
- For investors and credit-rating agencies: To the extent that ESG performance predicts asset-quality and distress-risk outcomes, ESG scores could provide a useful, forward-looking screening signal for equity and debt investors in NBFC paper, complementing rather than substituting for conventional credit-rating analysis.
- For NBFC-sector policy more broadly: The RBI's own data showing rising microfinance-segment stress alongside improving sector averages suggests that ESG-linked resilience benefits, if real, are unlikely to be uniform across NBFC business models, and that smaller, base-layer and microfinance-focused NBFCs — largely outside this study's sample frame — may warrant separate, targeted research and policy attention.

10. Limitations and Future Research Directions

10.1 Limitations

- Sample coverage: The purposive sample is restricted to large, listed, ESG-rated upper-/middle-layer NBFCs, and necessarily excludes the much larger population of smaller, unlisted, base-layer NBFCs, including the microfinance segment that the RBI's own data identify as currently under the greatest stress; results may not generalise to that segment.
- ESG-score comparability: CRISIL, MSCI, Refinitiv and other ESG Rating Providers use different methodologies and are not perfectly comparable; a study relying on a single provider's scores (as recommended here, for consistency) inherits that provider's specific methodological choices and potential rating disagreement relative to other providers.
- Endogeneity and reverse causality: Despite the fixed-effects and system-GMM safeguards specified in Section 5.6, the possibility that profitable, well-governed NBFCs simply have more resources to invest in ESG (rather than ESG causing profitability) cannot be fully eliminated with observational data alone.
- Short post-mandate window: Because BRSR Core assurance only began phasing in from FY2023-24, the number of years with fully assured, comparable ESG disclosures is still short relative to the study's nominal FY2020–FY2026 window, limiting the power of lagged-effect tests such as H7.
- Illustrative empirical section: As disclosed in Section 5.8 and Section 7, the regression results reported here are demonstration output calibrated to the literature and sector data rather than the output of an actual estimation on a complete institutional-grade panel; this is a limitation of the present paper, not of the proposed methodology, and is the single most important item for follow-up empirical work.

10.2 Future Research Directions

- Replicate the models specified in Section 5 using a licensed institutional database (CMIE Prowess, Bloomberg, or Refinitiv Eikon) to construct the complete FY2020–FY2026 firm-year panel and report actual, publishable regression estimates.
- Extend the sample to unlisted and smaller NBFCs, including microfinance institutions, where the RBI has flagged the greatest current asset-quality stress, using regulatory (rather than market) data where ESG ratings are unavailable.
- Investigate the AI-driven risk analytics and ethical digital-lending themes flagged alongside ESG integration by Madhusudhan and Kumar (2026) — for example, by testing whether NBFCs with stronger governance/ESG scores also exhibit more transparent, less biased algorithmic underwriting practices.
- Disaggregate the composite ESG score into Environmental, Social and Governance sub-scores to test whether, as this paper's discussion (Section 8) hypothesises, the Governance pillar carries disproportionate weight in explaining NBFC financial resilience relative to the Environmental and Social pillars.
- Examine cross-country comparisons between Indian NBFCs (shadow banks) and similarly structured non-bank lenders in other emerging markets to test the generalisability of an ESG–financial-resilience relationship beyond the Indian regulatory context.

11. Conclusion

This paper set out to examine whether ESG performance is associated with the financial performance and financial risk of Indian NBFCs — a question motivated by the sector's history of governance-driven crises, its newly mandatory ESG disclosure regime, and a specific, recently documented gap in the Indian NBFC literature (Madhusudhan & Kumar, 2026). Drawing on a rigorous review of Indian and international ESG–financial-performance and ESG–financial-risk evidence, the paper developed a dual conceptual model — a direct ESG-to-financial-risk model and a mediated ESG-to-operational-efficiency-to-financial-performance-to-financial-resilience model — and specified a transparent, ethically documented panel-data methodology, using ROA, ROE, Tobin's Q, the Altman Z-score, leverage and the Gross NPA ratio as outcome measures, for a purposive sample of large listed Indian NBFCs over FY2020–FY2026.

Verified sector- and firm-level evidence — a sector-wide decline in NBFC Gross NPAs alongside rising capital adequacy, and a documented CRISIL ESG rating upgrade at a major NBFC occurring within this same period — is directionally consistent with the hypothesised relationship, and the illustrative demonstration analysis in Section 7 shows how the proposed panel-regression and mediation models would be estimated and reported once a complete institutional-grade dataset is assembled. Consistent with the ethical standards this paper has sought to uphold throughout, these illustrative results are explicitly not presented as proof of the hypothesized relationship; that proof remains an important item of future empirical work, for which this paper provides a complete, replicable, and directly usable research design. In the interim, the weight of the broader Indian and international evidence reviewed here suggests that sustainability is unlikely to be merely a compliance cost for Indian NBFCs, and may instead be a meaningful, governance-anchored contributor to the financial resilience of a sector whose stability remains central to India's continued financial inclusion and credit-deepening agenda.

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