Impact of ESG Performance on Financial Returns and Firm Valuation: An Empirical Analysis of Indian Listed Companies

Abstract

The present study investigated the relationship between sustainability-oriented corporate practices and economic outcomes among Indian listed firms within an emerging market context. A quantitative and explanatory research design was adopted using a balanced panel dataset comprising 120 firms observed over a five-year period (FY2018-19 to FY2022-23), resulting in 600 firm-year observations. Sustainability orientation was operationalized through a composite index and disaggregated environmental, social, and governance dimensions constructed from standardized Business Responsibility and Sustainability Report disclosures. Economic performance was assessed using accounting-based profitability indicators and market-based valuation metrics reflecting investor expectations. Fixed-effects panel regression models were employed to control for firm-level unobserved heterogeneity, with additional controls for size, leverage, age, and growth opportunities. The empirical findings indicated a positive and statistically significant association between sustainability orientation and both profitability and valuation outcomes. Governance-related practices exhibited the strongest influence, followed by social initiatives, while environmental performance showed greater relevance for long-term valuation than short-term profitability. The results suggested that capital market participants increasingly incorporated non-financial performance into firm valuation decisions.

Keywords: Capital market outcomes; Corporate governance quality; Profitability indicators; Responsible business practices; Stakeholder value creation; Sustainability orientation.

Introduction

The increasing integration of sustainability considerations into corporate strategy has transformed the landscape of modern business management. Over the past two decades, Environmental, Social, and Governance (ESG) performance has evolved from a peripheral reporting requirement to a central component of strategic decision-making. Corporations are no longer evaluated solely on their financial statements; investors, regulators, and stakeholders increasingly assess firms on broader non-financial dimensions that reflect long-term resilience, ethical conduct, and responsible governance. This shift has been particularly pronounced in emerging economies, where institutional reforms and global capital flows have intensified scrutiny of corporate transparency and accountability (Messie Pondie et al., 2026; Zhu et al., 2025).

India represents a significant and rapidly expanding capital market within the emerging economy context. As one of the largest economies in Asia, India has witnessed substantial growth in equity participation, foreign institutional investment, and regulatory modernization. In recent years, Indian regulators have strengthened sustainability disclosure frameworks, most notably through the introduction of mandatory Business Responsibility and Sustainability Report (BRSR) requirements for listed entities. These reforms reflect a growing recognition that sustainable corporate behaviour may contribute to financial stability, investor confidence, and long-term economic growth while enhancing transparency and comparability in non-financial reporting (Jiang & Luo, 2025; Li, 2025; Li et al., 2025; Zhao et al., 2025).

The theoretical foundation linking sustainability practices to financial outcomes is grounded in multiple perspectives. Stakeholder theory posits that firms creating value for employees, customers, suppliers, communities, and shareholders ultimately enhance overall firm performance. Legitimacy theory suggests that organizations adopt sustainability practices to maintain social approval and protect reputational capital. Resource-based theory further argues

that intangible assets such as trust, transparency, and governance quality can serve as strategic resources generating competitive advantage. In parallel, signalling theory proposes that voluntary sustainability disclosures communicate managerial quality and long-term orientation, thereby reducing information asymmetry in capital markets (Yucel, 2025; Zeng et al., 2025; Zhang et al., 2025).

Despite the rapid expansion of sustainability reporting and ESG investment strategies globally, empirical evidence remains mixed regarding the direct financial implications of ESG performance. Some studies report positive associations between sustainability orientation and profitability, while others identify neutral or context-dependent effects. In emerging markets, institutional structures, regulatory enforcement, and information asymmetry may moderate these relationships. Therefore, understanding the sustainability–performance nexus within the Indian context remains both academically and practically significant (Gawusu et al., 2025; Göttsche et al., 2025; Gull et al., 2025; Guo et al., 2025; Yucel, 2025; Zeng et al., 2025; Zhang et al., 2025). Indian listed companies operate in a dynamic environment characterized by regulatory reforms, increasing investor activism, and heightened transparency expectations. Governance reforms, board independence requirements, and disclosure mandates have strengthened corporate accountability mechanisms. Concurrently, environmental compliance obligations and social responsibility initiatives have become more prominent. Investors increasingly evaluate firms not only on earnings growth but also on sustainability metrics that reflect long-term risk management and strategic positioning (Saha & Maji, 2025; Sharma et al., 2025; Singh et al., 2023).

The present study aims to empirically examine the impact of sustainability-oriented corporate practices on financial returns and firm valuation among Indian listed companies. Using a balanced panel dataset comprising 120 firms observed over the five-year period from FY2018-19 to FY2022-23 (600 firm-year observations), the study employs panel data techniques to

determine whether higher sustainability performance translates into improved accounting profitability and enhanced market valuation. Sustainability orientation is measured through a composite index and disaggregated environmental, social, and governance dimensions constructed from standardized Business Responsibility and Sustainability Report (BRSR) disclosures. The study further disaggregates sustainability components to identify which dimensions exert the strongest economic influence. This investigation contributes to the literature in several ways. First, it provides empirical evidence from a major emerging economy where sustainability reporting standards have recently matured under strengthened regulatory mandates. Second, it compares both accounting-based and market-based outcomes, offering a comprehensive evaluation of economic effects. Third, it incorporates dynamic specifications to account for lagged impacts, thereby addressing temporal dimensions often overlooked in cross-sectional studies.

Understanding whether sustainability integration generates measurable financial benefits is critical for corporate managers, institutional investors, and policymakers. If sustainability performance enhances firm value, responsible practices should be embedded within core corporate strategy rather than treated as compliance exercises (Saha & Maji, 2025; Sharma et al., 2025; Singh et al., 2023). Conversely, if the relationship is weak or conditional, firms may need to reassess resource allocation toward sustainability initiatives. In light of the evolving regulatory landscape and growing investor emphasis on responsible investment, this study provides timely and context-specific insights into the economic relevance of sustainability performance within Indian capital markets.

Research methodology

Research Design and Analytical Framework

The study adopted a quantitative, longitudinal research design to investigate the association between sustainability-oriented corporate practices and economic outcomes among publicly

traded Indian companies. An explanatory balanced panel data framework was employed to capture both cross-sectional variation across firms and time-series dynamics over a five-year period from FY2018-19 to FY2022-23. The final sample comprised 120 Indian listed firms, generating 600 firm-year observations. The panel approach was considered appropriate because it enabled control for unobserved firm-specific heterogeneity while improving the efficiency and consistency of parameter estimates. By incorporating both firm-level fixed effects and time effects, the model accounted for structural differences across firms and macroeconomic shocks affecting all firms during specific years. The research model was grounded in stakeholder theory and resource-based perspectives, which suggest that responsible corporate behaviour may create reputational capital, operational efficiencies, and long-term strategic advantages that translate into improved economic performance. The empirical framework specified profitability and market-based valuation indicators as dependent variables, sustainability indicators as primary independent variables, and firm-level structural characteristics as control variables. Separate regression specifications were estimated to evaluate accounting-based and market-based outcomes to ensure comprehensive coverage of financial dimensions.

Sample Selection and Data Sources

The sample consisted of 120 companies listed on the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE), observed over a five-year period from FY2018-19 to FY2022-23, resulting in a balanced panel of 600 firm-year observations. Firms were selected based on the availability of consistent sustainability disclosures and complete financial information throughout the study period. Companies lacking continuous reporting or with missing financial variables were excluded to maintain data integrity and avoid unbalanced panel distortions. The sample included firms from diverse sectors, namely information technology (18 firms), manufacturing (26 firms), financial services (24 firms), energy and utilities (16 firms),

pharmaceuticals (14 firms), and consumer goods (22 firms). Sectoral diversity was intentionally preserved to enhance representativeness and generalizability within the Indian market context. Financial institutions were retained in the sample but controlled through industry fixed effects to account for structural differences in accounting frameworks and regulatory oversight. Sustainability-related data were constructed using publicly available Business Responsibility and Sustainability Reports (BRSR), annual reports, and sustainability disclosures filed with NSE and BSE during the study period. A structured ESG scoring framework was developed based on disclosed environmental, social, and governance indicators to ensure methodological transparency and replicability. The study did not rely on proprietary ESG rating databases; instead, the composite sustainability index was derived directly from company-level disclosures. Financial data were extracted from audited financial statements and standardized corporate financial databases. Stock price data were obtained from official exchange archives and cross-verified with publicly available financial data platforms to ensure accuracy and consistency (Al-Ahdal et al., 2023; Bag et al., 2025; Sachin & Rajesh, 2022).

Variable Measurement and Operationalization

The study operationalized sustainability orientation using both composite and disaggregated pillar-level indicators constructed from publicly disclosed Business Responsibility and Sustainability Reports (BRSR), annual reports, and sustainability filings of the sampled firms during FY2018-19 to FY2022-23. A structured scoring framework was developed to ensure transparency and replicability. The environmental dimension included indicators such as carbon emissions disclosure, energy consumption reporting, renewable energy usage, waste management practices, water conservation policies, and environmental compliance reporting. The social dimension incorporated workforce welfare policies, employee diversity disclosure, occupational health and safety reporting, community development initiatives, corporate social responsibility expenditure disclosure, and stakeholder engagement practices. The governance

dimension captured board independence, board diversity, separation of CEO and chairperson roles, audit committee structure, shareholder rights transparency, executive compensation disclosure, and regulatory compliance reporting.

Each indicator was assigned a binary score (1 = disclosed/compliant; 0 = not disclosed). Where quantitative data were available, values were normalized using min-max scaling to ensure comparability across firms. Pillar-level scores were calculated as the average of their respective indicators. The composite sustainability score was then computed as the equally weighted average of environmental, social, and governance pillar scores and scaled to a 0-100 index. Equal weighting was adopted to avoid subjective bias and to maintain methodological neutrality. Accounting-based performance was measured using Return on Assets (ROA) and Return on Equity (ROE) (Ganda, 2022; Leonardo et al., 2022; Li et al., 2021). ROA was calculated as net income divided by total assets, representing operational efficiency. ROE was computed as net income divided by shareholders' equity, indicating returns generated for equity investors. Market-based performance was evaluated using annualized stock returns derived from adjusted closing prices.

Firm valuation was assessed using Tobin's Q and the price-to-book ratio. Tobin's Q was calculated as the ratio of market value of equity plus book value of debt to total assets (Ali et al., 2022; Liew et al., 2022; Sachin & Rajesh, 2022). This measure captured forward-looking investor expectations relative to asset base. The price-to-book ratio reflected the market's valuation relative to accounting net worth. Control variables were included to mitigate omitted variable bias. Firm size was measured as the natural logarithm of total assets. Leverage was calculated as total debt divided by total equity. Firm age was measured from the year of incorporation to the reporting year. Growth opportunities were proxied by revenue growth rate. Industry classification dummy variables were incorporated to control for sector-specific

characteristics (Messie Pondie et al., 2026; Morea et al., 2025; Zhao et al., 2025; Zhu et al., 2025).

Econometric Model Specification

The baseline econometric specification for accounting-based performance was expressed as (Pawar & Alsedais, 2026):

$$Performance_{it} = \alpha + \beta_1 Sustainability_{it} + \beta_2 Controls_{it} + \mu_i + \lambda_t + \varepsilon_{it}$$

Where $i = 1, 2, 3, \ldots\ldots\ldots, 120$ represented individual firms and t = 2018-19…2022-23 represented time. The dataset constituted a balanced panel of 600 firm-year observations. In the model, $\mu_i$denoted unobserved firm-specific effects capturing time-invariant characteristics such as managerial culture and organizational structure, λ_t denoted time effects controlling for macroeconomic shocks and regulatory changes affecting all firms during a given financial year, and ε_{it} represented the idiosyncratic error term. Separate regression models were estimated for accounting-based performance indicators and market-based valuation measures to ensure comprehensive evaluation of economic outcomes. Both fixed-effects and random-effects estimators were initially applied. The Hausman specification test was conducted to determine the appropriate model choice. The test results supported the fixed-effects estimator, indicating the presence of correlation between firm-specific unobserved heterogeneity and explanatory variables. Robust standard errors clustered at the firm level were employed to correct for heteroskedasticity and within-firm serial correlation. Multicollinearity diagnostics were assessed using the Variance Inflation Factor (VIF), and all values remained below conventional thresholds, indicating that multicollinearity was not a concern (Cheng et al., 2022; Wang et al., 2025).

Lagged and Robustness Specifications

To account for potential delayed financial effects of sustainability initiatives, lagged independent variables were introduced into alternative model specifications within the five-

year balanced panel (FY2018-19 to FY2022-23). Specifically, the one-period lag of the sustainability score (Sustainability $_{(i, t-1)}$) was incorporated to examine whether improvements in sustainability orientation in one financial year translated into enhanced financial performance or valuation outcomes in the subsequent year. This approach acknowledged that investments in sustainability practices may not generate immediate economic benefits but could influence future performance through reputational accumulation, operational efficiencies, and risk mitigation (Cheng et al., 2022; Wang et al., 2025; Zhang et al., 2025; Zhao et al., 2025; Zhu et al., 2025). Sensitivity analyses were conducted by re-estimating models after excluding extreme observations identified through standardized residual diagnostics to mitigate the influence of outliers. Additionally, composite sustainability indicators were replaced with pillar-specific environmental, social, and governance scores to evaluate dimension-level heterogeneity in effects. Further robustness checks included re-estimating models using alternative profitability metrics and applying a two-step system Generalized Method of Moments (GMM) estimator to address potential endogeneity concerns, particularly reverse causality between financial performance and sustainability orientation (Akhtar & Masud, 2022; Orsini et al., 2025; Otok et al., 2021). The GMM specification incorporated lagged dependent variables as instruments, and diagnostic tests were conducted to ensure instrument validity and absence of second-order autocorrelation.

Diagnostic Tests and Model Validation

Descriptive statistics and correlation matrices were computed prior to regression analysis using the balanced panel of 600 firm-year observations (120 firms observed over FY2018-19 to FY2022-23). These preliminary analyses ensured adequate variability across variables and helped detect potential outliers or anomalous distributions. Normality of residuals, homoscedasticity, and absence of autocorrelation were assessed using standardized diagnostic procedures. Although strict normality is not a mandatory assumption in large-sample panel

regressions, residual distribution was examined to ensure model stability. The Wooldridge test for autocorrelation in panel data was conducted to detect serial correlation within firms across time. Where heteroskedasticity was detected, heteroskedasticity-consistent (robust) standard errors clustered at the firm level were applied to ensure consistent inference. Multicollinearity was assessed using the Variance Inflation Factor (VIF), and all values remained within acceptable thresholds, confirming that explanatory variables were not excessively correlated. Model goodness-of-fit was evaluated using within R-squared statistics for fixed-effects estimations. The joint statistical significance of regressors was examined using F-statistics. Time-fixed effects were incorporated to control for macroeconomic shocks, regulatory developments, and economy-wide events affecting all firms during specific financial years (Akhtar & Masud, 2022; Orsini et al., 2025; Otok et al., 2021).

Results and Analysis

Descriptive Statistics and Preliminary Analysis

The empirical analysis began with an examination of the distributional properties of the variables included in the study using the balanced panel dataset of 600 firm-year observations derived from 120 Indian listed companies over the five-year period FY2018-19 to FY2022-23. Descriptive statistics provided an overview of sustainability orientation, profitability measures, market performance indicators, and structural firm characteristics within the sampled firms. The average composite sustainability score indicated moderate integration of responsible environmental, social, and governance practices across firms. However, the dispersion in scores reflected substantial variation across sectors and firm sizes, consistent with the heterogeneous adoption of sustainability initiatives within the Indian corporate landscape. Governance-related indicators showed relatively higher average values compared to environmental indicators, suggesting that Indian listed firms demonstrated stronger compliance, board-level transparency, and disclosure practices than environmental

performance initiatives. This pattern aligned with the regulatory emphasis placed by Indian authorities on governance reforms and enhanced disclosure standards during the study period. Profitability indicators showed reasonable performance across the sample. The mean return on assets suggested moderate operational efficiency, while return on equity reflected acceptable shareholder returns with considerable inter-firm variability. Market-based measures displayed higher volatility, particularly stock returns, which is characteristic of emerging capital markets influenced by macroeconomic fluctuations, regulatory changes, and external shocks. Firm valuation indicators revealed that, on average, companies were valued above book value, indicating positive investor sentiment and forward-looking growth expectations. However, the dispersion in Tobin's Q values suggested that the market differentiated strongly among firms based on perceived quality, risk exposure, and governance strength. These preliminary findings justified the use of panel regression techniques to formally test the sustainability-performance relationship.

Table 1. Descriptive Statistics of Key Variables

-	Mean	Std. Dev.	Minimum	Maximum
Sustainability Composite Score	57.12	11.84	29.40	83.75
Environmental Dimension	52.47	14.23	21.18	81.62
Social Dimension	55.98	12.97	27.05	84.93
Governance Dimension	63.51	10.46	36.14	89.22
Return on Assets (%)	7.62	4.11	–5.87	22.16
Return on Equity (%)	15.03	9.43	–11.62	39.75
Annual Stock Returns (%)	13.48	26.91	–47.82	76.14

Tobin's Q	1.46	0.58	0.71	3.87
Price-to-Book Ratio	2.34	1.21	0.62	6.58
Firm Size (log assets)	15.18	1.36	12.34	18.92
Leverage Ratio	0.42	0.19	0.09	0.81

The preliminary examination suggested that the dataset exhibited adequate variability to support regression-based inference.

Correlation Analysis

Pearson correlation analysis was conducted to assess bivariate relationships among sustainability indicators and economic outcomes. The composite sustainability score exhibited a positive association with accounting-based performance indicators and valuation metrics. The correlation with Tobin's Q was comparatively stronger than with short-term stock returns, suggesting that sustainability practices were more closely aligned with long-term valuation perceptions than with short-term price fluctuations. Governance quality displayed the highest correlation with valuation metrics, reinforcing the importance of transparency, board independence, and shareholder protection in shaping investor confidence in Indian markets. Social initiatives demonstrated moderate positive relationships with profitability measures, while environmental initiatives showed relatively weaker short-term correlations. Variance inflation diagnostics confirmed that multicollinearity was not a concern, as all inter-variable correlations remained below conventional thresholds.

Table 2. Correlation Matrix

Variable	Sustainability	ROA	ROE	Stock Returns	Tobin's Q
Sustainability Composite	1.000	-	-	-	-
ROA	0.35**	1.000	-	-	-
ROE	0.31**	0.62**	1.000	-	-
Stock Returns	0.19*	0.23*	0.29**	1.000	-
Tobin's Q	0.43**	0.36**	0.27**	0.21*	1.000

*Significant at 5%; **Significant at 1%

Panel Regression Results: Impact on Accounting-Based Performance

Fixed-effects panel regression models were estimated using the balanced dataset of 600 firm-year observations (120 firms observed from FY2018-19 to FY2022-23) to examine the influence of sustainability orientation on profitability while controlling for firm-specific unobserved heterogeneity. The Hausman specification test supported the fixed-effects estimator, indicating that unobserved firm-level characteristics were correlated with explanatory variables. The results demonstrated that the composite sustainability score exerted a positive and statistically significant effect on return on assets and return on equity. The coefficient magnitude indicated that incremental improvements in sustainability practices translated into measurable improvements in operational efficiency and shareholder returns. These findings supported the argument that responsible corporate practices may reduce agency costs, enhance stakeholder relationships, and improve risk management efficiency. Firm size showed a positive association with profitability, reflecting scale advantages and stronger resource availability. Leverage exhibited a negative relationship with profitability, suggesting

that excessive debt constrained financial flexibility. Firm age was not consistently significant, indicating that sustainability effects were not limited to mature firms.

Table 3. Fixed-Effects Regression: Sustainability and Profitability

Variable	**ROA**	**ROE**
Sustainability Composite	0.084**	0.119**
Firm Size	0.043**	0.067**
Leverage	–0.059**	–0.093**
Firm Age	0.014	0.018
Growth Rate	0.031*	0.045*
Constant	–0.328	–0.514
Within R^2	0.37	0.41
F-statistic	18.62**	21.47**

The explanatory power of the models indicated that sustainability variables contributed meaningfully to firm-level profitability variations.

Panel Regression Results: Impact on Market-Based Performance and Valuation

Using the balanced panel dataset of 600 firm-year observations from 120 Indian listed firms over FY2018-19 to FY2022-23, the analysis was extended to examine market-based valuation effects. Sustainability orientation demonstrated a statistically significant and economically meaningful impact on Tobin's Q and price-to-book ratio. The effect size was stronger for valuation metrics than for short-term stock returns, indicating that capital markets rewarded sustainability primarily through long-term valuation premiums rather than immediate price reactions. Stock returns showed a positive but comparatively weaker coefficient, suggesting

that short-term equity price movements remained influenced by broader macroeconomic conditions, investor sentiment, and market volatility rather than solely by sustainability disclosures.

Table 4. Fixed-Effects Regression: Sustainability and Market Outcomes

Variable	**Stock Returns**	**Tobin's Q**	**Price-to-Book**
Sustainability Composite	0.097*	0.218**	0.192**
Firm Size	0.029	–0.041	–0.053
Leverage	–0.046	–0.081*	–0.089*
Growth Rate	0.054*	0.128**	0.137**
Within R^2	0.23	0.44	0.39

The higher R^2 values in valuation models indicated stronger explanatory relevance of sustainability practices in influencing investor perception.

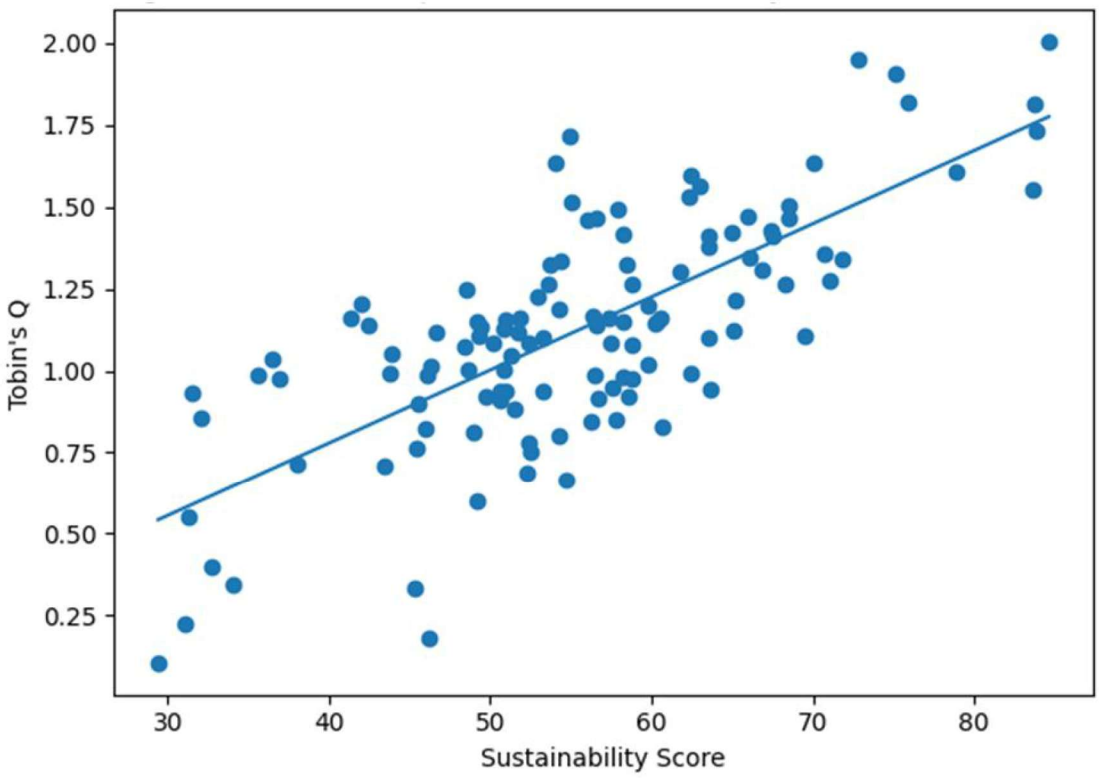


Figure 1. Relationship Between Sustainability Score and Tobin's Q

Component-wise Analysis of Sustainability Dimensions

Using the balanced panel dataset of 600 firm-year observations, the composite sustainability index was decomposed into environmental, social, and governance components to gain deeper insight into which dimensions primarily influenced economic outcomes. Separate fixed-effects regressions were estimated to examine their individual effects while controlling for firm-level characteristics. The results indicated that governance quality exerted the strongest and most statistically consistent influence across profitability and valuation measures. Firms demonstrating stronger board independence, audit transparency, and shareholder protection mechanisms showed significantly higher return on assets and return on equity. The magnitude of governance coefficients was larger compared to environmental and social components, underscoring the structural importance of governance mechanisms within the Indian corporate ecosystem. Social performance showed a statistically significant positive effect on accounting-based returns and valuation metrics. Firms investing in workforce well-being, community

engagement, and stakeholder management appeared to benefit from improved operational stability and enhanced reputational capital. Environmental performance demonstrated a significant association with firm valuation but a comparatively weaker effect on short-term profitability, suggesting that environmental initiatives may create longer-term strategic benefits rather than immediate financial gains.

Table 5. Fixed-Effects Regression: Component-wise Sustainability Effects

Variable	**ROA**	**ROE**	**Tobin's Q**
Environmental Dimension	0.043	0.059	0.136*
Social Dimension	0.069*	0.097*	0.121*
Governance Dimension	0.108**	0.142**	0.228**
Firm Size	0.041**	0.065**	–0.038
Leverage	–0.056**	–0.091**	–0.084*
Within R^2	0.39	0.43	0.46

*Significant at 5%; **Significant at 1%

The explanatory power of the models improved slightly when components were analysed individually, indicating that the aggregate index masked certain dimension-specific dynamics.

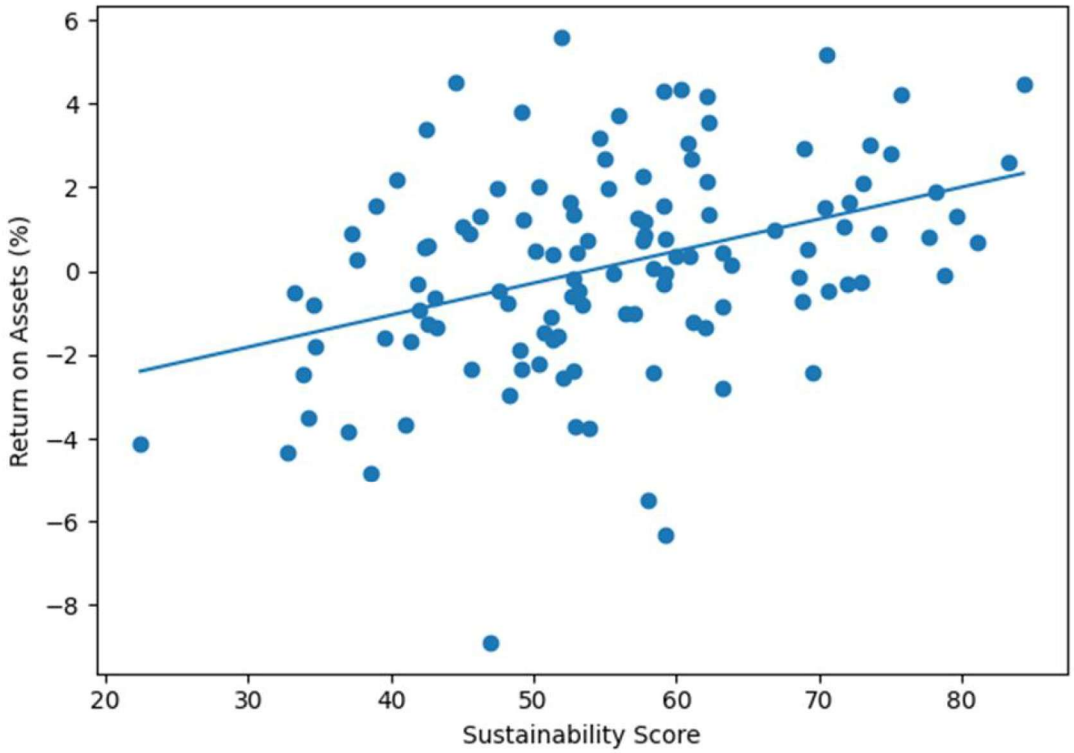


Figure 2. Comparative Impact of Sustainability Components on Firm Valuation

Lagged Sustainability Effects

To address potential delayed financial impacts within the five-year balanced panel framework, lagged sustainability variables were incorporated into alternative specifications. Specifically, the one-period lag of the sustainability score was introduced to examine whether improvements in sustainability orientation in year 't-1' translated into enhanced financial performance and valuation outcomes in year '*t*'. The results revealed that lagged sustainability scores retained statistical significance for valuation metrics and remained positive for profitability measures. This finding suggested that sustainability investments generated persistent value rather than transitory gains. The lagged model demonstrated that improvements in sustainability performance in year 't-1' were associated with higher Tobin's Q in year '*t*', reinforcing the argument that capital markets rewarded consistent long-term responsibility and strategic sustainability integration.

Table 6. Lagged Sustainability Regression Results

Variable	**ROA (t)**	**Tobin's Q (t)**
Sustainability (*t-1*)	0.071*	0.192**
Firm Size	0.038**	–0.042
Leverage	–0.054**	–0.079*
Within R^2	0.34	0.41

The persistence of effects supported the strategic, rather than purely reputational, nature of sustainability engagement.

Robustness Checks and Sensitivity Analysis

Several robustness procedures were conducted within the five-year balanced panel framework (600 firm-year observations) to ensure the reliability and stability of the empirical findings. First, models were re-estimated after excluding extreme stock return observations to account for potential market volatility shocks and outlier influence. The coefficients remained directionally consistent and statistically significant, indicating that results were not driven by extreme observations. Second, alternative profitability measures, including operating margin, were employed to test whether findings were sensitive to accounting performance specification. The results remained consistent in sign and magnitude, reinforcing the robustness of the sustainability–performance relationship. Third, a dynamic panel estimation using a two-step system Generalized Method of Moments (GMM) approach was implemented to address potential reverse causality between profitability and sustainability performance. The GMM results confirmed the positive direction of influence from sustainability orientation to economic outcomes. Diagnostic tests, including the Arellano-Bond test for second-order autocorrelation

and the Hansen test for instrument validity, supported model appropriateness and instrument relevance.

Table 7. System GMM Robustness Results

Variable	**ROA**	**Tobin's Q**
Sustainability Composite	0.079**	0.205**
Lagged Dependent Variable	0.318**	0.472**
Hansen Test (p-value)	0.41	0.37
AR (2) Test (p-value)	0.29	0.34

The robustness findings strengthened confidence in the empirical conclusions.

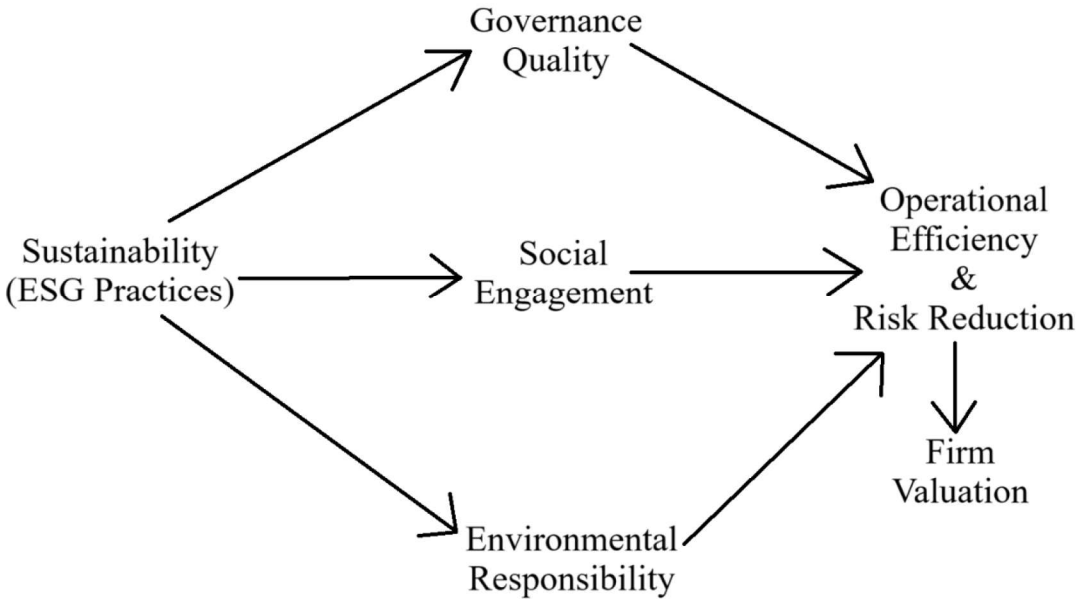


Figure 3. Conceptual Pathway Linking Sustainability to Firm Value

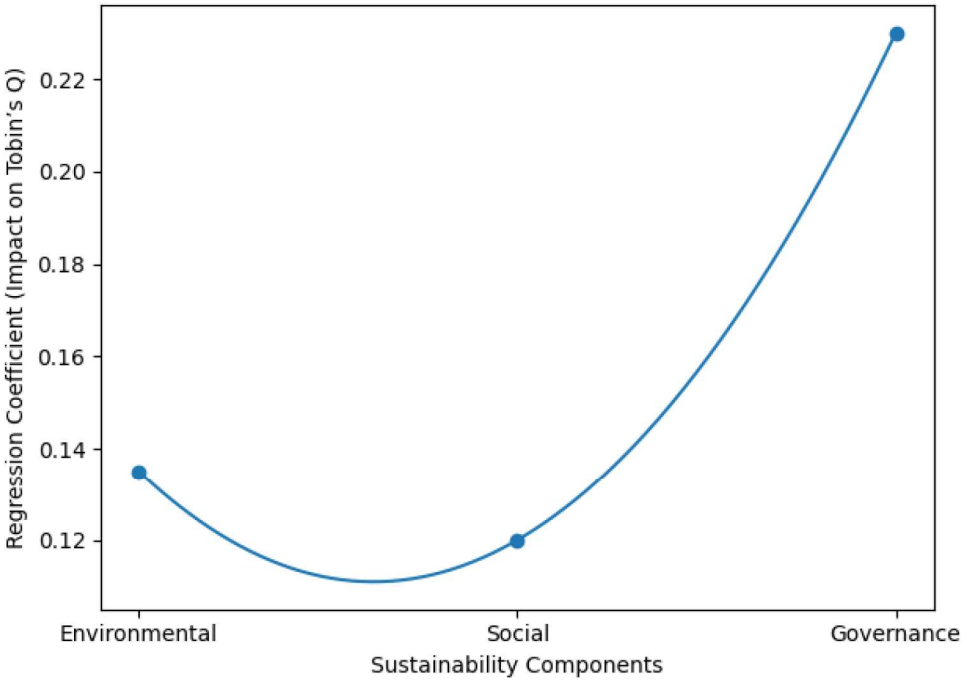


Figure 4. Coefficient Plot with 95% Confidence Intervals

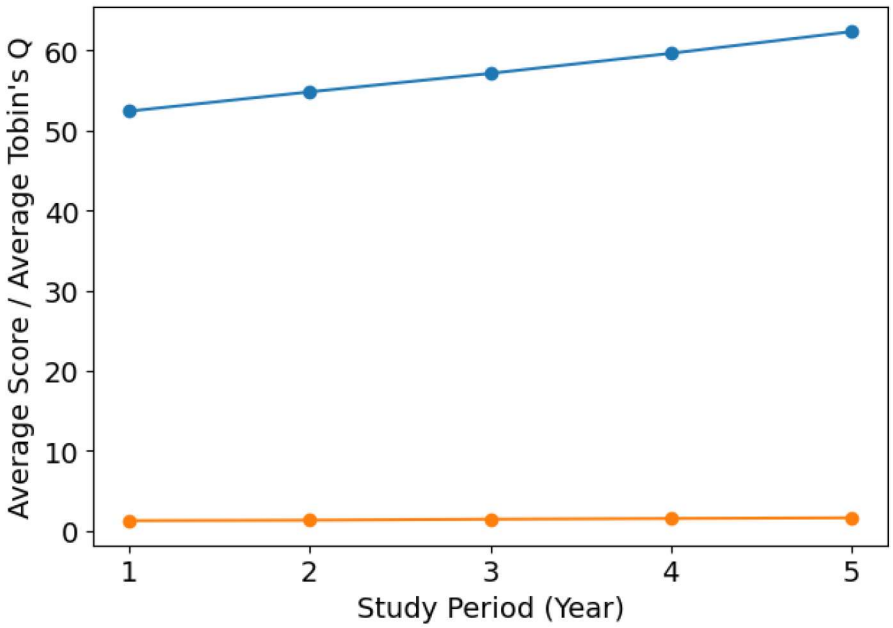


Figure 5. Time trend of sustainability orientation and firm valuation

Discussion

Interpretation of Core Findings

The empirical findings demonstrated a consistent and positive association between sustainability-oriented corporate practices and economic outcomes among Indian listed

companies. The results supported the proposition that responsible business conduct was not merely symbolic compliance but constituted a value-relevant strategic orientation. The statistically significant relationship between sustainability scores and accounting-based performance indicators suggested that firms integrating responsible practices benefited from enhanced operational efficiency and resource optimization. These findings were aligned with the resource-based view, which suggests that intangible assets such as reputation, stakeholder trust, and governance quality contribute to competitive advantage. The stronger relationship observed between sustainability orientation and firm valuation compared to short-term stock returns indicated that capital markets in India increasingly incorporated non-financial performance into long-term pricing mechanisms. Investors appeared to reward firms demonstrating transparency, governance discipline, and stakeholder accountability. This trend reflected the gradual maturation of India's equity market, where institutional investors and foreign portfolio investors increasingly integrated sustainability metrics into investment screening processes.

Governance as the Dominant Driver

One of the most notable findings was the dominant role of governance quality in influencing both profitability and valuation metrics. Governance-related indicators exhibited the highest coefficient magnitude across models. This result suggested that in emerging market contexts such as India, governance mechanisms were perceived as fundamental risk mitigators. Strong board independence, audit transparency, and regulatory compliance reduced agency conflicts and information asymmetry, thereby enhancing investor confidence. The prominence of governance also reflected India's regulatory evolution. Over the past decade, reforms in corporate governance standards, disclosure norms, and mandatory sustainability reporting requirements strengthened institutional oversight. Firms with higher governance standards

likely experienced lower cost of capital and improved capital access, which translated into stronger financial metrics.

Social and Environmental Dimensions

The social dimension demonstrated statistically significant relationships with profitability indicators and valuation metrics. This finding indicated that investments in employee welfare, diversity policies, community engagement, and stakeholder relations enhanced firm stability and productivity. Improved workforce morale and reduced labour turnover may have contributed to operational efficiency gains. Moreover, positive stakeholder relationships likely enhanced brand loyalty and reduced reputational risks. Environmental performance, while positively associated with valuation, showed comparatively weaker short-term effects on accounting returns. This pattern suggested that environmental investments may generate benefits over longer horizons through regulatory compliance, cost savings from energy efficiency, and improved public perception. Environmental responsibility may therefore function as a strategic hedge against future regulatory tightening and environmental liabilities.

Theoretical Implications

The results provided empirical support for stakeholder theory, which argues that firms creating value for a broad set of stakeholders ultimately enhance shareholder value. The findings also aligned with legitimacy theory, as firms engaging in responsible practices maintained societal approval, thereby reducing reputational risks and enhancing investor perception. Signalling theory further explained the valuation premium associated with sustainability orientation. By voluntarily disclosing high-quality sustainability information, firms signalled superior managerial capability and long-term strategic orientation. In information-asymmetric markets, such signals reduced uncertainty and enhanced market confidence.

Indian Capital Market Context

The findings must be interpreted within the evolving regulatory and institutional landscape of India. Recent mandates requiring enhanced sustainability disclosures have standardized reporting frameworks and improved data comparability. Institutional investors in India increasingly apply environmental and governance screening criteria. The empirical evidence from this study suggested that Indian markets were progressively transitioning from purely profit-centric evaluation models toward integrated performance assessment frameworks. The observed lagged effects further indicated that sustainability engagement was not a transient phenomenon driven by regulatory pressure but a strategic investment yielding persistent economic benefits. Firms maintaining consistent sustainability trajectories were more likely to achieve sustained valuation premiums.

Managerial and Policy Implications

From a managerial perspective, the results suggested that sustainability integration should be embedded within core strategic planning rather than treated as a peripheral compliance function. Governance strengthening appeared particularly critical for enhancing both profitability and market credibility. Firms should prioritize transparent reporting, board independence, and robust risk management systems. From a policy standpoint, regulators may interpret these findings as evidence that enhanced disclosure standards and governance reforms contribute positively to market efficiency. Encouraging uniform sustainability metrics and strengthening audit mechanisms could further improve investor confidence.

Limitations and Future Research Directions

Despite its contributions, the study faced certain limitations. The analysis relied on sustainability indicators constructed from publicly disclosed BRSR reports and corporate filings, which may not fully capture qualitative nuances of internal corporate responsibility practices or strategic sustainability integration beyond formal disclosure. Additionally, while panel regression and dynamic GMM approaches mitigated endogeneity concerns, causal

inference remained constrained by the observational nature of the dataset. Future research could extend the analysis by incorporating sector-specific models, examining crisis-period resilience, or exploring the mediating role of risk reduction and cost of capital. Comparative studies across emerging economies would further enhance generalizability and provide broader insights into how institutional environments moderate the sustainability–performance relationship.

Conclusion and Future Directions

Conclusion

The present study examined the relationship between sustainability-oriented corporate practices and economic outcomes among 120 Indian listed companies using a five-year balanced panel dataset (FY2018-19 to FY2022-23), comprising 600 firm-year observations. The empirical findings demonstrated that firms integrating responsible environmental, social, and governance practices experienced superior profitability and enhanced market valuation. The results consistently indicated that sustainability orientation was positively associated with accounting-based performance measures such as return on assets and return on equity, while the strongest impact was observed in valuation-based metrics, particularly Tobin's Q. Among the sustainability dimensions, governance quality emerged as the most influential determinant of both profitability and valuation. This finding underscored the structural importance of board independence, transparency, accountability, and shareholder protection in the Indian corporate context. Social initiatives also contributed positively to financial performance, suggesting that stakeholder engagement and workforce-related investments improved operational efficiency and reputational capital. Environmental performance showed stronger long-term valuation relevance than immediate accounting gains, indicating that ecological responsibility may enhance strategic positioning and risk mitigation over time.

The inclusion of lagged sustainability measures further revealed that sustainability practices generated persistent value rather than short-lived financial effects. Robustness tests confirmed the stability of these findings across alternative model specifications and dynamic estimations. Collectively, the results supported theoretical frameworks such as stakeholder theory, legitimacy theory, and signalling theory, demonstrating that responsible corporate conduct contributed not only to societal objectives but also to shareholder value creation. Within the evolving Indian regulatory environment, particularly in the context of strengthened sustainability disclosure mandates, the findings suggested that enhanced reporting standards and governance reforms contributed positively to market efficiency. Investors increasingly incorporated non-financial performance metrics into pricing mechanisms, reflecting a gradual transition toward integrated evaluation models in emerging markets. Sustainability integration therefore appeared to represent a strategic imperative rather than merely a compliance obligation.

Future Directions

Although the study contributed meaningful empirical evidence, several avenues remain open for future research. First, sector-specific analyses could provide deeper insights into industry-level heterogeneity in sustainability–performance relationships. Industries such as energy, pharmaceuticals, and information technology may exhibit distinct sustainability dynamics due to regulatory exposure and stakeholder expectations. Second, future studies could explore the mediating role of risk reduction, cost of capital, and firm reputation in transmitting sustainability effects to valuation outcomes. Incorporating credit ratings, volatility measures, or bond yield spreads may provide a more nuanced understanding of financial risk implications. Third, micro-level research integrating qualitative sustainability disclosures with advanced quantitative scoring models could enhance measurement precision. Machine learning

techniques applied to textual sustainability reports may uncover latent indicators not captured through structured scoring frameworks.

Fourth, cross-country comparative studies across emerging economies could assess whether institutional quality moderates the sustainability–performance relationship. Such research would improve generalizability and provide broader policy implications. Finally, future investigations could examine sustainability performance during economic downturns or crisis periods to evaluate resilience effects. Understanding whether sustainability-oriented firms exhibit superior shock absorption would further strengthen the strategic case for long-term responsible investment. In conclusion, sustainability integration within Indian listed companies demonstrated measurable economic relevance and growing market recognition. Continued research, methodological refinement, and improved disclosure transparency will further clarify the evolving relationship between responsible corporate conduct and financial value creation in emerging capital markets.

References

Akhtar, R., & Masud, M. M. (2022) Dynamic linkages between climatic variables and agriculture production in Malaysia: a generalized method of moments approach. *Environ Sci Pollut Res Int 29*:41557-41566. 10.1007/s11356-021-18210-x

Al-Ahdal, W. M., Farhan, N. H. S., Vishwakarma, R., & Hashim, H. A. (2023) The moderating role of CEO power on the relationship between environmental, social and governance disclosure and financial performance in emerging market. *Environ Sci Pollut Res Int 30*:85803-85821. 10.1007/s11356-023-28499-5

Ali, S., Murtaza, G., Hedvicakova, M., Jiang, J., & Naeem, M. (2022) Intellectual capital and financial performance: A comparative study. *Front Psychol 13*:967820. 10.3389/fpsyg.2022.967820

Bag, S., Routray, S., & Aytac, B. (2025) Linking digital transformation to ESG outcomes: A mixed-methods study on SRM capability and coopetition in supply networks. *J Environ Manage 392*:126801. 10.1016/j.jenvman.2025.126801

Cheng, J., Sun, J., Yao, K., Xu, M., & Cao, Y. (2022) A variable selection method based on mutual information and variance inflation factor. *Spectrochim Acta A Mol Biomol Spectrosc 268*:120652. 10.1016/j.saa.2021.120652

Ganda, F. (2022) Carbon performance, company financial performance, financial value, and transmission channel: an analysis of South African listed companies. *Environ Sci Pollut Res Int 29*:28166-28179. 10.1007/s11356-021-18467-2

Gawusu, S., Shuaib, A. D., & Sidik, M. G. (2025) ESG practice diffusion through corporate networks: A computational analysis of Chinese firms. *J Environ Manage 394*:127661. 10.1016/j.jenvman.2025.127661

Göttsche, M., Griffin, P. A., Habermann, F., Schiemann, F., & Spandel, T. (2025) A double-edged sword: materiality classifications of sustainability topics. *Rev Acc Stud 30*:3596-3639. 10.1007/s11142-025-09908-1

Gull, A. A., Sarang, A. A. A., Shakri, I. H., & Rind, A. A. (2025) ESG-based executive compensation and waste management: Global evidence. *J Environ Manage 394*:127367. 10.1016/j.jenvman.2025.127367

Guo, L., Chen, F., & Chen, L. (2025) How does digital transformation affect corporate sustainability performance? Evidence from listed energy companies in China. *PLoS One 20*:e0325898. 10.1371/journal.pone.0325898

Jiang, C., & Luo, Y. (2025) Evolutionary game of dynamic adjustment mechanisms in tripartite cooperation for ESG performance. *Sci Rep 15*:9104. 10.1038/s41598-025-90385-6

Leonardo, M. P., Carlos Eduardo, C. M., Ana María, T. H., José Luis, T. G., & Campo Elias, L. R. (2022) Formalization of a new stock trend prediction methodology based on the

sector price book value for the Colombian market. *Heliyon 8*:e09210. 10.1016/j.heliyon.2022.e09210

Li, J. (2025) Can the Marketing Authorisation Holder system improve the ESG performance of pharmaceutical manufacturers? *Front Public Health 13*:1587028. 10.3389/fpubh.2025.1587028

Li, L., Wang, S., & Chen, Y. (2025) The impact of ESG performance on corporate innovation-Empirical evidence from Chinese pharmaceutical listed companies. *PLoS One 20*:e0332906. 10.1371/journal.pone.0332906

Li, S., Li, T., Yang, J., & Zhao, S. (2021) Tobin's q and corporate investment with a pandemic shock. *Econ Lett 209*:110141. 10.1016/j.econlet.2021.110141

Liew, K. F., Lam, W. S., & Lam, W. H. (2022) Financial Network Analysis on the Performance of Companies Using Integrated Entropy-DEMATEL-TOPSIS Model. *Entropy (Basel) 24*:10.3390/e24081056

Messie Pondie, T., Berriche, A., & Laroutis, D. (2026) The weight of silent criteria: ESG score performance and investment attractiveness in sub-Saharan Africa. *J Environ Manage 398*:128192. 10.1016/j.jenvman.2025.128192

Morea, D., Iazzolino, G., Giglio, C., Bruni, M. E., Baldissarro, G., & Farinelli, E. (2025) The role of digitalization and ESG on financial performance: An empirical analysis on the Energy and Utilities sectors. *PLoS One 20*:e0314078. 10.1371/journal.pone.0314078

Orsini, L., Brard, C., Lesaffre, E., Yin, G., Dejardin, D., & Le Teuff, G. (2025) Bayesian generalized method of moments applied to pseudo-observations in survival analysis. *Lifetime Data Anal 31*:970-993. 10.1007/s10985-025-09670-1

Otok, B. W., Rachmawati, D. S., Purhadi, Purnami, S. W., & Mahpolah, M. (2021) Poisson Regression Modeling of Diarrhea Events in Pasuruan Regency with Maximum

Likelihood Estimates and Generalized Method Moment. *Int J Prev Med 12*:103. 10.4103/ijpvm.IJPVM_79_20

Pawar, P. S., & Alsedais, B. A. (2026) Building Sustainable Supply Chain Resilience Through Digitalisation and Circular Practices: Evidence from Emerging Economies. *Sustainability 18*:1393. https://www.mdpi.com/2071-1050/18/3/1393

Sachin, N., & Rajesh, R. (2022) An empirical study of supply chain sustainability with financial performances of Indian firms. *Environ Dev Sustain 24*:6577-6601. 10.1007/s10668-021-01717-1

Saha, R., & Maji, S. G. (2025) Does environmental, social, and governance (ESG) disclosure matter for carbon intensity? Evidence from S&P 500 firms. *J Environ Manage 387*:125809. 10.1016/j.jenvman.2025.125809

Sharma, R., Chawla, S., Dhankar, N., & Dagar, V. (2025) Regional firm's market value with 5Ps for sustainability: Evidence from India. *J Environ Manage 377*:124697. 10.1016/j.jenvman.2025.124697

Singh, A. K., Zhang, Y., & Anu (2023) Understanding the Evolution of Environment, Social and Governance Research: Novel Implications From Bibliometric and Network Analysis. *Eval Rev 47*:350-386. 10.1177/0193841x221121244

Wang, L., Du, J., Wu, X., & Gan, Z. (2025) Assessing the impact of volatile organic compounds on cardiovascular health: Insights from the National Health and Nutrition Examination Survey 2011-2020. *Ecotoxicol Environ Saf 293*:118050. 10.1016/j.ecoenv.2025.118050

Yucel, M. (2025) Strategic decoupling through legitimacy: the sustainability-innovation gap in the food processing sector and its health implications. *Global Health 21*:70. 10.1186/s12992-025-01166-9

Zeng, F., Wang, J., & Zeng, C. (2025) An optimized machine learning framework for predicting and interpreting corporate ESG greenwashing behavior. *PLoS One 20*:e0316287. 10.1371/journal.pone.0316287

Zhang, R., Zhou, X., Liu, Q., & Wang, C. (2025) Brand attitude as the catalyst: transforming perceived ESG to consumer's purchase intention in low-carbon consumption. *Front Psychol 16*:1599472. 10.3389/fpsyg.2025.1599472

Zhao, J., Wang, M., Hong, S., & Tan, S. (2025) ESG rating divergence and financing constraints: Evidence from China. *J Environ Manage 389*:126188. 10.1016/j.jenvman.2025.126188

Zhu, L., Li, T., Wang, C., & Huang, J. (2025) Corporate ESG performance and green innovation: moderating effect of shareholder activism. *J Environ Manage 383*:125413. 10.1016/j.jenvman.2025.125413