

Impact of Sustainability Indices on Stock Market Performance: Evidence from India

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Abstract

Purpose: The study aims to analyze the relationship between sustainability-oriented stock indices and overall stock market performance in India. It specifically examines the return behavior, market impact, and future momentum of the Sustainability Index in comparison with the benchmark market index.

Methodology: A descriptive and quantitative research design is adopted using monthly time-series data from 2018 to 2025. Secondary data sourced from Bombay Stock Exchange, India, National Stock Exchange, India and Investing.com are analyzed using Augmented Dickey Fuller unit root tests, Capital Asset Pricing Model, Ordinary Least Squares regression, and Auto Regressive Integrated Moving Average forecasting techniques in E-Views.

Findings: The findings reveal that the Sustainability Index exhibits improving risk-adjusted return performance over time with declining dependence on systematic market risk. Regression results indicate a strong and statistically significant positive relationship between sustainability indices and benchmark market performance. Forecasting outcomes further suggest a stable and favorable upward momentum for both sustainability and benchmark indices, reflecting increasing investor confidence in Environmental Social Governance focused investments.

Conclusion: The study concludes that sustainability indices have become an integral part of the Indian equity market, significantly influencing benchmark index movements. Sustainability-driven investments are increasingly shaped by long-term fundamentals, regulatory alignment, and responsible investment practices. These insights highlight the growing strategic importance of sustainability indices in shaping future market dynamics beyond traditional risk–return frameworks.

Keywords: Sustainability Indices, S&P ESG 100 Index, Nifty 100 Index.

Introduction

The stock market is a vital component of the financial system, serving as an organized platform for the issuance and trading of equity shares and facilitating efficient capital allocation between investors and corporations. Through its primary market, firms raise long-term capital via public offerings, while the secondary market ensures liquidity, price discovery, and continuous valuation of securities, supported by well-regulated exchanges. Beyond enabling corporate financing and wealth creation, stock markets act as key indicators of economic conditions, reflecting investor sentiment, corporate performance, and macroeconomic developments. In India, the stock market plays a crucial role in economic growth by mobilizing household and institutional savings into productive investments, promoting transparency and corporate governance under regulatory oversight, and attracting foreign capital inflows. With the growing

adoption of advanced financial instruments and sustainability-oriented practices such as Environmental Social Governance (ESG) investing, the Indian stock market continues to enhance market efficiency, broaden investor participation, and support long-term, sustainable economic development.

A sustainability index, also known as a Socially Responsible Investment (SRI) or Environmental, Social, and Governance (ESG) index, tracks the performance of companies that meet defined sustainability standards beyond traditional financial criteria. These indices employ rigorous ESG-based screening methods, assessing factors such as environmental impact, social responsibility, ethical conduct, and governance quality, thereby directing investment toward firms committed to long-term sustainable practices. By serving as benchmarks for sustainability-focused portfolios, such indices influence capital allocation, enhance corporate accountability, and promote responsible business behavior. Sustainability has also emerged as a key determinant of stock market performance, as firms with strong ESG practices tend to exhibit better risk management, lower volatility, improved investor confidence, and greater resilience during market

downturns. Moreover, alignment with sustainability principles enables companies to adapt to evolving regulatory, social, and environmental expectations, fostering innovation and long-term value creation. Consequently, sustainability indices play a crucial role in linking ethical considerations with financial performance, supporting stable market growth and sustainable economic development.

The expansion of sustainability indices in global and domestic stock markets reflects a significant shift in investor preferences, corporate strategies, and regulatory emphasis towards ESG considerations. Growing demand from institutional and retail investors for responsible investment options has driven substantial capital inflows into sustainability indices, encouraging firms to adopt ESG-compliant practices. Empirical evidence suggests that these indices often perform competitively with traditional benchmarks, particularly during periods of market stress, due to lower risk exposure and enhanced resilience. Regulatory initiatives promoting ESG disclosure and sustainable finance, along with advancements in data analytics and ESG reporting frameworks, have further strengthened the credibility, transparency, and adoption of sustainability indices. Together, these factors underscore the increasing integration of sustainability indices into mainstream investment practices and their role in supporting stable, long-term market growth.

Thematic Literature Review on Sustainability Indices and Stock Market Performance

Theme	Author(s) & Year	Context / Data	Methodology	Key Findings / Conclusions
ESG Factors and Market Performance	Ooi Kok Loang (2024)	Global stock markets (2010–2023)	Econometric analysis	Renewable energy investments positively influence returns, while high carbon emissions adversely affect market performance; ESG is strategically important for sustainable development.
Performance of	Deepmala Jasuja et al. (2021)	Indian sustainability indices	Markov Regime Switching Model	ESG-based indices exhibit regime-dependent performance, highlighting their relevance in dynamic market conditions.

Sustainability Indices	Preeti Sharma et al. (2020)	BSE GREENEX, CARBONE X vs. SENSEX (India)	Return and volatility analysis	Traditional indices outperform ESG indices, but sustainability indices show resilience, indicating growing maturity of SRI in India.
	Jyoti Nirban et al. (2025)	Indian sustainability vs. thematic indices	Econometric and historical analysis	Sustainability indices offer competitive risk-adjusted returns, making them viable long-term investment options.
Index Inclusion and Stock Performance	Moonsoo Kang et al. (2020)	DJSI North America firms	Event study & long-term performance analysis	Firms experience abnormal positive returns and increased institutional ownership post-inclusion, reflecting sustained demand for sustainability stocks.
	Oberndorfer et al. (2013)	German firms in DJSI World & STOXX	Event study	Inclusion in globally visible sustainability indices may trigger short-term negative stock market reactions.
Risk, Volatility, and Market Resilience	Manivannan Babu et al. (2022)	Indian ESG indices during COVID-19	GARCH models	Despite high volatility, sustainability indices delivered positive returns, confirming resilience during crisis periods.
	Yilmaz et al. (2020)	BIST Sustainability Index (Turkey)	Risk–return and beta analysis	Sustainability index inclusion reduces total risk and enhances resilience, though it does not significantly improve returns.
Market Efficiency in Sustainability Indices	Prasid Gurung et al. (2023)	BSE GREENEX companies (India)	Random walk tests	Green stocks do not follow a random walk, rejecting EMH and suggesting informational advantages for investors.
Sustainability Scores and Firm Value	Mete Bumin et al. (2024)	BIST Sustainability Index firms	Panel regression analysis	A negative relationship exists between sustainability scores and firm value, possibly due to perceived cost burdens of ESG investments.

Research Gap

Despite the growing global prominence of sustainability indices, their direct influence on stock market performance remains insufficiently understood, particularly in emerging markets such as India. Existing literature is largely concentrated on developed economies and short-term market reactions. As a result, empirical evidence on whether sustainability practices contribute to stable and consistent stock returns

remains inconclusive in the Indian context. Given the increasing adoption of ESG principles driven by regulatory initiatives and evolving investor preferences, there is a clear need for a comprehensive empirical examination of the financial relevance of sustainability indices in India. This study addresses this gap by analyzing the impact of sustainability indices on stock performance, risk, and market dynamics, thereby providing valuable insights for investors, policymakers, and firms seeking to promote sustainable and resilient economic growth.

Objectives of the Study

1. To examine the return performance of sustainability index.
2. To analyze the impact of sustainability indices on the performance of benchmark market indices.
3. To assess the future market momentum of sustainability indices in relation to benchmark indices.

Hypothesis Of The Study

- **Null Hypothesis (H_{02}):** Sustainability indices have no significant impact on the performance of benchmark market indices.
- **Alternative Hypothesis (H_{12}):** The Sustainability indices have a significant impact on the performance of benchmark market indices.

Scope of the Study

The scope of the present study is confined to analyzing the relationship between sustainability-oriented stock indices and overall stock market performance in the Indian context using monthly time-series data from 2018 to 2025. The study focuses exclusively on the Standard & Poor Environmental Social Governance (S&P ESG) 100 Index as a proxy for sustainability performance and the Nifty 100 Index as the benchmark market indicator. Secondary data are sourced from Bombay Stock Exchange (BSE) India, National Stock Exchange, National Stock Exchange (NSE) India, and Investing.com, ensuring consistency and reliability of market information. The scope further encompasses an assessment of market momentum dynamics to understand the future performance linkage between sustainability indices and broader market indices.

Research Methodology

The study adopts a descriptive and quantitative research design using monthly time-series data from 2018 to 2025 to examine the impact of sustainability indices on stock market performance in India. Secondary data

are collected from BSE India, NSE India, and Investing.com through purposive sampling, with the S&P ESG 100 Index serving as the independent variable and the Nifty 100 Index as the dependent variable. The analysis employs the Augmented Dickey-Fuller test for stationarity, Capital Asset Pricing Model (CAPM) for risk–return assessment, Ordinary Least Squares (OLS) regression to evaluate the impact of sustainability indices on market performance, and the Auto Regressive Integrated Moving Average (ARIMA) model for forecasting, with all estimations conducted using E-Views. However, the findings are subject to certain limitations, as the study is confined to the Indian market and focuses solely on the S&P ESG 100 and Nifty 100 indices, which may limit broader generalizability. Additionally, reliance on secondary data entails dependence on data accuracy, the 2018–2025 period may not fully capture long-

term sustainability effects, and the exclusive use of quantitative techniques precludes consideration of qualitative influences such as investor sentiment and policy dynamics.

Tabulation Data Analysis and Discussion

This section presents a systematic tabulation, analysis, and discussion of empirical results in line with the stated objectives of the study. Using E-Views, the analysis evaluates the return performance of the sustainability index, examines its impact on benchmark market indices, and assesses future market momentum through ADF stationarity tests, CAPM-based risk–return assessment, OLS regression, and ARIMA forecasting models.

The descriptive statistics presents the Sustainability Index and the Nifty 100 Index, highlighting their central tendencies, volatility patterns, and distributional characteristics to provide an initial understanding of return behavior and stability.

Table 1: Descriptive Analysis of Sustainability Index and Nifty 100 Index

	Benchmark_index_price	Sustainability_index_price
Mean	16939.33	272.8993
Median	17186.15	284.8600
Maximum	26890.15	430.7900
Minimum	8731.150	135.1300
Std. Dev	5358.565	88.55052
Skewness	0.368531	0.222676
Kurtosis	1.845437	1.737292
Probability	0.024393	0.028777
Sum	1609237.	25925.43
Sum Sq. Dev	2.70E+09	737072.3
Observations	95	95

Interpretation

The table presents the descriptive statistics of the Sustainability Index and the Nifty 100 Index, highlighting their central tendency, dispersion, and distributional properties. The results depict that the Nifty 100 Index records a higher mean and wider price range with greater volatility, whereas the Sustainability Index exhibits comparatively lower variability and more stable price behavior. The findings highlight slight positive skewness and platykurtic distributions for both indices, and the conclusion indicates that while the benchmark index is relatively riskier, the sustainability index demonstrates greater stability.

The below Augmented Dickey-Fuller (ADF) unit root test for the Sustainability Index and the Benchmark Index to assess their stationarity properties prior to further time-series analysis.

Table 2: Unit root test for sustainability index and Benchmark Index

Variable	ADF t-Statistic	p-value
Sustain ability Index	−3.9964	0.0023
Benchmark Index	−7.9485	0.0000

Source: Secondary Data

Table 2 represents the Unit Root Test using the Augmented Dickey-Fuller (ADF) method indicate that both the ESG Index and the Benchmark Index the t-statistics (-3.9964) for ESG Index and -7.9485 for Benchmark Index) are significantly lower than the critical values, with p-values of 0.0023 and 0.0000, indicating that both the ESG Index and the Benchmark Index are stationary at their first differences, allowing for further analysis of their time series properties.

To address Objective 1, the study analyzes the return performance of the Sustainability Index by assessing its risk–return characteristics using the Capital Asset Pricing Model (CAPM) in comparison with the benchmark index.

Table 3: CAPM analysis of return performance of Sustainability Index

Year	Systematic Risk	Mean returns of Sus. Index	Mean returns of Benchmark Index	CAPM
2018	0.948904	-0.03151	-0.09883	-0.12529
2019	1.010758	0.967073	-0.08978	0.876326
2020	0.959598	1.932942	-0.29646	1.648461
2021	1.005169	2.128939	-0.18986	1.938095
2022	1.002193	0.502749	-0.11205	0.390455
2023	1.110511	1.363577	0.23879	1.628756
2024	0.349882	1.040014	-0.06061	1.018807
2025	-0.0207	0.712138	0.108015	0.709902

Source: Secondary Data

The table presents the CAPM-based assessment of the return performance of the Sustainability Index across different market phases. The results depict initial underperformance in 2018, followed by notable improvement in 2019 and strong risk-adjusted returns during 2020–2021 when systematic risk remained close to unity. The findings highlight a temporary weakening in 2022, renewed improvement in 2023 with higher market sensitivity, and sustained positive returns in 2024–2025 despite a sharp decline in beta, reflecting reduced market dependence. The conclusion indicates that, similar to real-time ESG investing trends where returns are increasingly driven by long-term sustainability fundamentals rather than short-term market movements, the Sustainability Index shows limitations of CAPM in fully capturing sustainability-driven return dynamics.

To address Objective 2, the study employs ordinary least squares (OLS) regression analysis to examine the extent to which movements in the sustainability index influence the performance of the benchmark market index.

Null Hypothesis (H_0): “Sustainability indices have no significant impact on the performance of benchmark market indices”

Table 4: Impact of ESG index on Benchmark index

Dependent variable: benchmark_index_price				
Method: Least Squares				
Sample: 2018M01 2025M11				
Variable		Std. Error	t-Statistic	Prob

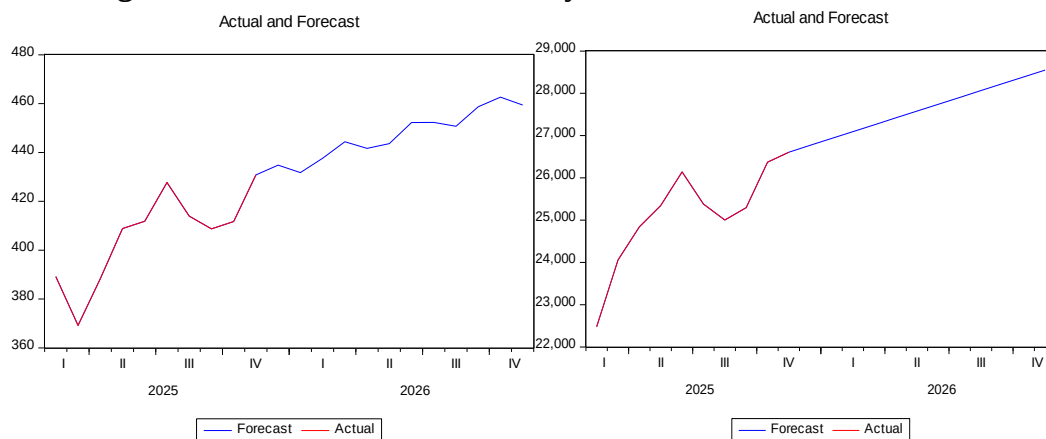
	Coefficient			
C	509.9556	182.2383	2.798289	0.0062
SUSTAINABILITY_INDEX	60.20308	0.635503	94.73297	0.0000
R-squared	0.989743	Mean dependent var		16939.33
Adjusted R-squared	0.989633	S.D. dependent var		5358.565
S.E. of regression	545.5978	Akaike info criterion		15.46247
Sum squared resid	27683956	Schwarz criterion		15.51623
Log likelihood	-732.4673	Hannan-Quinn criter		15.48419
F-statistic	8974.336	Durbin-Watson stat		0.923449
Prob(F-statistic)	0.000000			

Source Secondary Data

The table presents the OLS regression results examining the impact of the Sustainability Index (S&P ESG 100) on the Benchmark Index (Nifty 100). The results with values show a strong and statistically significant positive relationship, as indicated by the sustainability index coefficient of 60.203 ($p < 0.001$) and a high explanatory power with an R^2 of 0.9897. The findings highlight that nearly 99% of the variation in benchmark market performance is driven by movements in the sustainability index, underscoring the growing influence of ESG-oriented investments on broader market trends. The conclusion indicates that, similar to real-time market behavior where ESG-focused stocks increasingly shape overall index movements, sustainability indices play a decisive role in determining benchmark market performance, leading to the rejection of the null hypothesis.

To address Objective 3, the study applies the ARIMA forecasting model to evaluate the future market momentum of the sustainability index in comparison with the benchmark index and to assess their projected performance trends.

Figure 1: ARIMA for Sustainability Index and Benchmark Index



The figure presents the ARIMA-based forecasts of the Sustainability Index and the Benchmark Index to assess their future market momentum. The results with values indicate a stable and positive upward trend, with the S&P ESG 100 Index projected to move within the range of 431–463 and the Nifty 100 Index expected to rise between 26,608 and 28,550. The findings highlight sustained growth and increasing investor confidence in sustainability-focused investments alongside continued strength in the broader

equity market. The conclusion indicates that, similar to recent real-time market trends where ESG-oriented portfolios attract long-term capital inflows, both sustainability and benchmark indices are likely to experience favourable near-term performance.

Findings of the Study

1. The results found that the Sustainability Index underperformed in 2018 with negative mean returns (-0.03151) and a beta of 0.9489 , reflecting weak risk-adjusted performance during that year.
2. The findings indicate a strong improvement in return performance during 2019–2021, with mean returns rising to 0.9671 in 2019, 1.9329 in 2020, and 2.1289 in 2021, while systematic risk remained close to unity.
3. The study found that return performance weakened in 2022 despite stable systematic risk (beta ≈ 1.0022), suggesting limited explanatory power of market risk during periods of uncertainty.
4. The findings depict sustained positive returns in 2024–2025 (1.0400 and 0.7121) despite a sharp decline in beta (0.3499 to -0.0207), indicating reduced dependence on market risk and limitations of CAPM in explaining sustainability-driven returns.
5. The results found that the Sustainability Index has a strong and statistically significant positive impact on the Benchmark Index, as reflected by a high coefficient value of 60.203 with $p < 0.001$.
6. The findings indicate an exceptionally high explanatory power of the regression model, with an R^2 value of 0.9897 , showing that nearly 99% of the variation in benchmark market performance is explained by sustainability index movements.
7. The study found that the overall regression model is highly significant, as evidenced by the F-statistic of 8974.336 with a probability value of 0.0000 , confirming model robustness.
8. The results found that ARIMA forecasts project a stable and positive upward trend for both the Sustainability Index and the Benchmark Index, indicating favourable future market momentum.
9. The findings indicate increasing investor confidence in sustainability-focused investments, as reflected in the consistent growth outlook of the S&P ESG 100 Index.
10. The study found that the benchmark market index is expected to maintain strong performance alongside sustainability indices, suggesting aligned growth dynamics in the broader equity market.

Conclusion and Future Scope

The study concludes that sustainability indices have emerged as an integral component of contemporary equity markets, reflecting a real-time shift in investor preference toward responsible and ESG-aligned investments. The risk–return analysis indicates that sustainability-focused portfolios are increasingly driven by firm-level fundamentals, regulatory alignment, and long-term value creation rather than short-term market volatility. The regression analysis infers that the growing integration of ESG considerations by institutional investors, mutual funds, and policymakers has strengthened the linkage between sustainability indices and benchmark market performance. The forecasting analysis suggests that sustained capital inflows into ESG-oriented assets and supportive policy frameworks are likely to reinforce positive market momentum in the near term. The inference drawn is that sustainability investing is no longer peripheral but structurally embedded within market dynamics. The trends align with real-world developments such as mandatory ESG disclosures, green finance initiatives, and rising climate-conscious investment mandates. Consequently, the study infers that sustainability indices are positioned to play a durable and influential role in shaping future market behavior beyond traditional risk–return paradigms.

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