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Research paper

Analysis of The Performance of Sustainability Indices Compared to Thematic Indices in The Indian Stock Market

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Abstract

The growing global focus on sustainability has led to the development of sustainability indices, which evaluate companies based on environmental, social, and governance (ESG) criteria. At the same time, thematic indices, which concentrate on specific investment themes such as technology, infrastructure, or renewable energy, have gained popularity among investors. This study investigates the performance of sustainability indices compared to thematic indices within the Indian stock market.
By utilizing historical data, risk-return metrics, and econometric models, this research assesses whether sustainability indices deliver superior financial performance, lower volatility, or improved risk-adjusted returns in comparison to thematic indices. The findings of this research aim to provide valuable insights for investors, policymakers, and financial analysts on the trade-offs between sustainable investing and thematic investing in India.

Keywords: *Sustainability Indices; Thematic Indices; ESG Investing; Indian Stock Market; Risk-Adjusted Returns; Financial Performance; Sustainable Investing; Thematic Investing; Market Volatility.*

1. Introduction

In recent years, the global investment landscape has witnessed a paradigm shift toward responsible and forward-looking investing, with increasing emphasis on Environmental, Social, and Governance (ESG) considerations and thematic investment strategies. Numerous studies have established that incorporating ESG factors can significantly enhance long-term risk-adjusted returns and improve corporate accountability (Friede, Busch, & Bassen, 2015). ESG investing not only reflects ethical and sustainability concerns but also serves as a strategic approach to mitigate risks arising from climate change, regulatory penalties, and reputational damage (Clark, Feiner, & Viehs, 2015).
Parallelly, thematic investing—which focuses on capitalizing on macro-level trends such as clean energy, urban infrastructure, digital innovation, and demographic shifts—has gained substantial traction. According to BlackRock (2020), thematic investments provide an avenue for investors to align portfolios with transformative forces that are expected to shape the future economy. This approach often results in concentrated exposure to high-growth sectors, offering substantial upside potential, albeit with increased volatility.
Academic literature and industry reports collectively indicate that studying both ESG and thematic indices within a benchmark like the BSE 100 can offer deep insights into how India's largest companies are adapting to global sustainability norms and positioning themselves in key growth areas. This dual focus helps investors and researchers assess both ethical standing and strategic foresight in investment decision-making.
In the Indian context, both ESG and thematic investing are gaining momentum, particularly among institutional investors and regulatory bodies. The Securities and Exchange Board of India (SEBI) has mandated ESG disclosures under the Business Responsibility and Sustainability Reporting (BRSR) framework, underscoring the growing importance of ESG in Indian capital markets. Furthermore, indices such as the S&P BSE 100 ESG Index and various sectoral or thematic indices (e.g., green energy, FMCG, infrastructure) within the BSE 100 provide valuable tools for benchmarking and analyzing top-performing companies aligned with these emerging trends.
The BSE 100 index features a diverse range of firms across various industries, making it an ideal platform to assess the impact of sustainability indices quality on financial performance. This study aims to empirically compare the financial performance of Sustainability Indices Compared to Thematic Indices in The Indian Stock Market. This study aims to compare the BSE 100 ESG Index with a range of thematic indices on the basis of key performance indicators such as Compound Annual Growth Rate (CAGR), Standard Deviation, and Sharpe Ratio. Through a detailed correlation analysis, the study assesses how closely these indices align with the ESG index and what that implies for investment decisions.

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The analysis suggests that ESG indices are not necessarily superior in terms of return or risk-adjusted performance when compared to specific thematic indices in the Indian market. Some thematic indices, particularly Housing, Manufacturing, and Shariah, outperform ESG both in return and Sharpe ratio while maintaining relatively acceptable volatility levels.These findings encourage investors and fund managers to evaluate thematic opportunities alongside ESG, especially when optimizing for risk-return efficiency.

2. Motivation

The motivation to study ESG (Environmental, Social, and Governance) and thematic investing arises from the increasing recognition that traditional financial metrics alone are no longer sufficient to evaluate a company's long-term value and risk exposure. With global wto rapid technological disruption—investors are seeking frameworks that integrate sustainability, ethics, and future-oriented growth into decision-making (Eccles & Klimenko, 2019).

The rise of ESG investing is not just a trend but a structural shift in capital markets. According to the Global Sustainable Investment Alliance (GSIA, 2021), global ESG assets reached over $35 trillion, highlighting a growing consensus that sustainability considerations can enhance risk-adjusted returns. In India, increasing regulatory emphasis—such as SEBI's mandatory Business Responsibility and Sustainability Reporting (BRSR)—further underscores the relevance of ESG analysis, especially for large-cap stocks within indices like the BSE 100.

Simultaneously, thematic investing has gained prominence for offering exposure to transformational trends like clean energy, infrastructure development, and digital innovation. Unlike sector-based investing, thematic strategies cut across industries and align with long-term structural changes (BlackRock, 2020). This makes them attractive to investors who wish to capitalize on megatrends rather than short-term market movements.

Academic literature also highlights the overlap and synergy between ESG and thematic investing. While ESG focuses on how a company operates, thematic investing targets what a company does. Together, they represent a dual lens of ethical alignment and strategic foresight (Friede, Busch, & Bassen, 2015). Understanding this intersection is especially important in emerging markets like India, where economic growth must be balanced with sustainability.

Furthermore, the COVID-19 pandemic accelerated interest in both ESG and thematic investing, as investors witnessed how companies with strong ESG practices weathered the crisis better and how certain themes—such as healthcare, digitalization, and green energy—outperformed (Morningstar, 2021). This shift in investor behavior and portfolio construction practices motivates a deeper exploration of how ESG and thematic indices perform, interact, and influence market dynamics.

3. Literature Review

3.1. Prior studies on ESG vs non-ESG or thematic indices (global and Indian context)

A significant body of research has explored the performance differential between ESG and non-ESG portfolios, with most global studies showing either comparable or superior returns for ESG investments. Friede, Busch, and Bassen (2015) conducted a meta-analysis of over 2,000 empirical studies and found that approximately 90% reported a non-negative relationship between ESG factors and financial performance. In a global context, studies by MSCI and Morningstar have also indicated that ESG indices often outperform their conventional counterparts, especially during periods of market stress (MSCI, 2020).

In India, the trend mirrors global findings, although the academic literature is still emerging. According to a study by Singh and Mittal (2021), ESG funds in India demonstrated resilience and lower volatility during the COVID-19 pandemic compared to traditional funds. Similarly, the S&P BSE 100 ESG Index has shown competitive returns compared to the BSE 100 benchmark, suggesting that sustainability-focused investing does not compromise performance.

Recent studies suggest ESG outperformance is more consistent in developed markets (OECD, 2023), whereas emerging markets like India show volatility due to weaker ESG enforcement (Chakraborty & Jain, 2024).

Thematic indices, such as those tracking green energy or infrastructure, have also gained traction for capturing long-term structural growth. While these tend to be more volatile due to sectoral concentration, studies indicate that they can outperform the broader market when aligned with macroeconomic trends or policy tailwinds (BlackRock, 2020).

3.2. Role of sustainability in portfolio diversification and stability

Sustainability, particularly through ESG integration, has been found to enhance portfolio diversification and reduce downside risk. According to Eccles and Klimenko (2019), companies with strong ESG profiles are less exposed to legal, reputational, and environmental risks, making them more stable investments over time. By incorporating ESG criteria, investors can access a different set of risk-return characteristics, which improves overall portfolio efficiency.

In India, ESG-aligned portfolios often include companies with strong corporate governance, lower debt levels, and better compliance with regulatory frameworks, which naturally reduces risk exposure (KPMG, 2021). Additionally, ESG investing tends to favor low-correlation sectors, such as technology and clean energy, further contributing to diversification benefits.

3.3. Market behaviour towards green vs sector-focused investments

Investor behaviour has shown a growing tilt toward green and ESG-centric products, especially post-pandemic. Studies suggest that retail and institutional investors are increasingly factoring in sustainability risks, leading to inflows into ESG funds and green bonds (Morningstar, 2021). However, market sentiment towards thematic or sector-focused investments, such as infrastructure or FMCG, often depends on short- to medium-term policy changes, budget announcements, and global commodity trends (RBC Global Asset Management, 2020).

Green investments benefit from long-term policy support, while thematic sector indices respond to short-term cycles (RBC GAM, 2020).

Indian thematic funds in renewable energy and housing often outperform during sectoral booms but remain cyclical (Morningstar, 2023).

Green investments, particularly in renewable energy and electric mobility, have benefited from long-term policy support and global climate commitments, making them more attractive to long-horizon investors. Meanwhile, sectoral themes like FMCG or infra are more cyclical in nature, attracting shorter-term tactical investors seeking exposure to specific economic drivers.

4. Research Gap in The Indian Context

While the global body of research on ESG (Environmental, Social, Governance) investing and thematic investing is extensive, academic work in the Indian context remains relatively limited and fragmented. Most existing studies focus on ESG adoption in developed markets such as the U.S. and Europe, where ESG frameworks are more mature and standardized (Friede, Busch, & Bassen, 2015; Eccles & Klimenko, 2019). In contrast, India is still in the nascent stages of formal ESG integration, and systematic evaluations of ESG versus non-ESG portfolios are scarce.

Few Indian studies, such as Singh and Mittal (2021), have begun exploring the performance of ESG funds in comparison to traditional mutual funds, with findings suggesting better risk-adjusted returns and lower volatility for ESG-aligned portfolios. However, such research is often limited in scope, time frame, and sample size, lacking a consistent methodology for ESG evaluation. Moreover, little academic effort has been made to assess how ESG indices perform against thematic or sector-specific indices, particularly within major benchmarks like the BSE 100.

Thematic investing, while popular in financial advisory and investment platforms, has also not received sufficient academic attention in India. Research remains largely descriptive or anecdotal, focusing on investor interest in themes like green energy, infrastructure, and digital transformation (KPMG, 2021). However, there is limited empirical analysis of the volatility, returns, or correlation structures of thematic indices in India's equity market.

Furthermore, the interaction between ESG and thematic approaches has been underexplored. Globally, studies are beginning to evaluate how these two frameworks can complement each other (BlackRock, 2020), but such insights are almost absent in Indian academic literature. There is also a lack of investor behavior studies examining whether Indian investors perceive ESG or thematic investments as more trustworthy, profitable, or relevant in their decision-making process.

Lastly, with SEBI's recent introduction of the Business Responsibility and Sustainability Reporting (BRSR) framework, companies are now disclosing ESG-related data more comprehensively. However, academic utilization of this new dataset is minimal, indicating a timely and valuable research opportunity.

5. Research Questions for The Study

1) What is the return performance of ESG-based indices compared to thematic-based indices in the Indian stock market?
2) How does the volatility of ESG indices differ from that of thematic indices over a selected time period?
3) Do ESG indices demonstrate superior risk-adjusted performance compared to thematic indices?
4) What is the degree of correlation between ESG indices and thematic indices, and what does this imply about their co-movement and diversification potential?

6. Objectives of The Study

1) To obtain Returns for ESG and Thematic based Indices.
2) To obtain Volatility of ESG Indices and Thematic Indices.
3) To obtain Risk Adjusted Performance for ESG Indices and Thematic Indices
4) To find correlation between ESG Indices and Thematic Indices.

7. Hypothesis for The Study

Hypothesis 1: to achieve first objective Return Performance , given below hypothesis are framed

H_{01} (Null Hypothesis): There is no significant difference in returns between ESG indices and thematic indices in the Indian stock market.

H_{11} (Alternative Hypothesis): There is a significant difference in returns between ESG indices and thematic indices in the Indian stock market.

Hypothesis 2: to achieve second objective volatility of indices, given below hypothesis are framed

H_{01} (Null Hypothesis): There is no significant difference in the volatility levels of ESG indices and thematic indices.

H_{11} (Alternative Hypothesis): There is a significant difference in the volatility levels of ESG indices and thematic indices.

Hypothesis 3: to achieve third objective Risk-Adjusted Performance of indices , given below hypothesis are framed

Risk-Adjusted Performance

H_{01} (Null Hypothesis): There is no significant difference in risk-adjusted performance (e.g., Sharpe ratio, Treynor ratio) between ESG and thematic indices.

H_{11} (Alternative Hypothesis): ESG indices show significantly different risk-adjusted performance compared to thematic indices.

Hypothesis 4: to achieve fourth objective correlation analysis between these indices , given below hypothesis are framed

H_{01} (Null Hypothesis): There is no significant correlation between the performance of ESG indices and thematic indices.

H_{11} (Alternative Hypothesis): There is a significant correlation between the performance of ESG indices and thematic indices.

8. Methodology

1) Data Collection

- Indices Considered: ESG Indices: BSE 100 ESG Index, Thematic Indices: BSE 500 Shariah, BSE Capital Markets & Insurance, BSE CPSE, BSE Diversified Financials Revenue Growth Index, BSE Financials Ex- Banks 30 Index, BSE Housing Index, BSE India Infrastructure Index, BSE India Manufacturing Index, BSE India Sector Leaders, BSE Internet Economy, BSE Power & Energy, BSE Premium Consumption, BSE Private Banks, BSE PSU Banks, BSE PSU, BSE Select Business Groups
- Data: Monthly data (Oct 2017–Mar 2025) for BSE 100 ESG and 16 thematic indices.
- Data Sources: Official Website of Bombay Stock Exchange (BSE)
- Risk-Free Rate: 5% assumed, based on average yield of Indian 10-year government securities (2017–2025, RBI reports).

- Metrics: CAGR for returns; Standard Deviation for volatility; Sharpe Ratio for risk-adjusted returns; correlation coefficient for co-movement.
- Hypothesis Testing: Significance at 5% ($p < 0.05$). Null hypotheses rejected when p-values indicate statistical differences.

2) Return Analysis

- Objective: To calculate and compare the average returns of ESG and thematic indices.
- Method: How to Calculate Compound Annual Growth Rate (CAGR)

$$CAGR = \left(\left(\frac{EV}{BV} \right)^{\frac{1}{n}} - 1 \right) \times 100$$

Where:
EV = Ending Value
BV = Beginning Values
n = Number of Years

To calculate the CAGR of an investment:
Divide the value of an investment at the end of the period by its value at the beginning of that period. Raise the result to an exponent of one divided by the number of years. Subtract one from the subsequent result. Multiply by 100 to convert the answer into a percentage. The CAGR formula gives an annualized rate of return, which is useful for comparing the performance of different investments over time.
The compound annual growth rate isn't a true return rate, but rather a representational figure. It is essentially a number that describes the rate at which an investment would have grown if it had grown at the same rate every year and the profits were reinvested at the end of each year. For stock market investors, this can be particularly useful in comparing the performance of different stocks. The CAGR does not take into account the discount rate, which is critical in assessing the present value of future returns.

3) Volatility Analysis

- Objective: To assess and compare the risk (volatility) of ESG and thematic indices.
- Method: To measure volatility, researcher has used standard deviation of returns over a given period here the approach .First calculate monthly return : The formula for monthly return, denoted as rt, is: rt = (Ending Value / Beginning Value) - 1.

Where :-
Ending Value: This represents the value of the investment at the end of the month.
Beginning Value: This is the value of the investment at the beginning of the month.
Subtract 1: This step converts the result into a percentage, indicating the rate of return.
To calculate volatility, we use standard deviation formula:

1. Compute Log Returns:
Use the formula for logarithmic returns:

$$r_i = \ln\left(\frac{P_i}{P_{i-1}}\right)$$

Where P_i is the closing price at month i.

2. Find the Mean Log Return ($\bar{r}$) :
Compute the average of all log returns:

$$\bar{r} = \frac{1}{N}\sum r_i$$

3. Calculate Variance:
Compute the variance using:

$$\sigma^2 = \frac{1\downarrow}{N-1}\sum (r_i - \bar{r})^2$$

4. Find the Standard Deviation (σ) :
Take the square root of variance:

$$\sigma = \sqrt{\sigma^2}$$

Volatility measures the dispersion of returns higher the volatility means greater price fluctuations, which indicates higher risk. Researcher has calculated volatility using standard deviation of monthly returns, then annualize it. Higher Volatility indicates higher risk. If an investor is considering ESG Investments, this tells them how much they might expect returns to vary year over year.

4) Risk-Adjusted Performance Analysis

- Objective: To analyse performance after adjusting for risk.
- Metrics: The Sharpe Ratio is one of the most commonly used metrics to calculate risk-adjusted performance of an investment or portfolio. It tells you how much excess return you are getting for each unit of risk you take. 5% annual Risk-Free Rate is Assumed for all the indices.

Sharpe Ratio Formula:

$$\text{Sharpe Ratio } = \frac{R_p - R_f}{\sigma_p}$$

Where:

- R_p = Return of the portfolio/investment
- R_f = Risk-free rate (e.g., return on government bonds or T-bills)
- σ_p = Standard deviation of the portfolio's return (a measure of risk)

Interpretation:

- Higher Sharpe Ratio = Better risk-adjusted return
- Sharpe Ratio > 1: Good
- Sharpe Ratio > 2: Very Good
- Sharpe Ratio > 3: Excellent

5) Correlation Analysis

- Objective: To assess the co-movement between ESG and thematic indices.
- Interpretation: how strongly two variables move together:

a) +1 = perfect positive correlation
b) 0 = no correlation
c) –1 = perfect negative correlation

6) Statistical Tools and Software

- Software: Excel, and E Views is used the analyse the result.
- Tests Used: Descriptive & Inferential statistics and Correlation Analysis

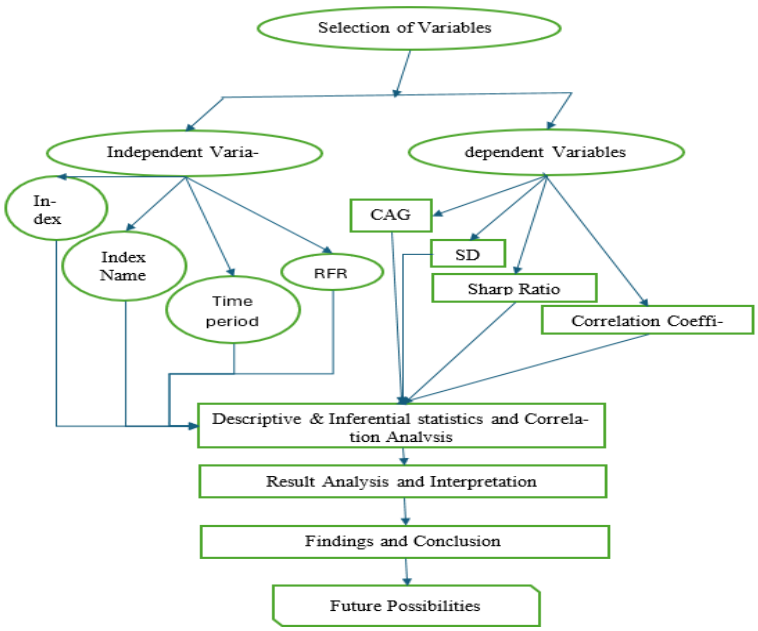
9. Variables

Table 1: Variables Used for the Study

Independent		Dependent
1.	Index Type	1. CAGR
2.	Index Name	2. Standard Deviations
3.	Time Period	3. Sharp Ratio
4.	Risk Free Rate	4. Correlation Coefficient

Source: Authors.

10. Research Model



This research model is created which shows how variables will be used in study to come to result

11. Results and Discussion

CAGR, Standard Deviations and Sharp Ratio of all indices
Here is the combined result of CAGR, Standard Deviations and Sharp Ratio of all the Indices ESG and Thematic both total 16 thematic indices are selected for study to compare with BSE 100 ESG (Sustainability Indices) in BSE market.

Table 2: CAGR, Standard Deviations and Sharp Ratio of All Indices Used in Study

NAME OF INDICES	CAGR	STANDARD DEVIATIONS	SHARP RATIO
BSE 100 ESG	11.43%	17.44%	0.31
BSE 500 SHARIAH	14.72%	4.37%	0.58
BSE CAPITAL MARKETS & INSURANCE	-21.59%	6.84%	-3.89
BSE CPSE	1.79%	6.98%	0.197
BSE DIVERSIFIED FINANCIALS REVENUE GROWTH INDEX	5.50%	7.64%	0.047
BSE FINANCIALS EX- BANKS 30 INDEX	10.96%	4.91%	0.12
BSE HOUSING INDEX	28.56%	17.47%	1.35
BSE INDIA INFRASTRUCTURE INDEX	13.93%	22.75%	0.40
BSE INDIA MANUFACTURING INDEX	13.95%	7.42%	1.8743
BSE INDIA SECTOR LEADERS	-24.91%	7.72%	-3.2264
BSE INTERNET ECONOMY	-15.91%	8.98%	-1.77
BSE POWER & ENERGY	-33.17%	6.33%	-5.24
BSE PREMIUM CONSUMPTION	-13.59%	6.58%	-2.06
BSE PRIVATE BANKS	7.27%	7.35%	0.99
BSE PSU BANKS	-16.96%	13.24%	0.29
BSE PSU	8.99%	7.44%	0.467
BSE SELECT BUSINESS GROUPS	-26.45%	4.12%	-0.535

Source: Authors.

Exhibit 1. Visualization of CAGR (Returns) of Indices.

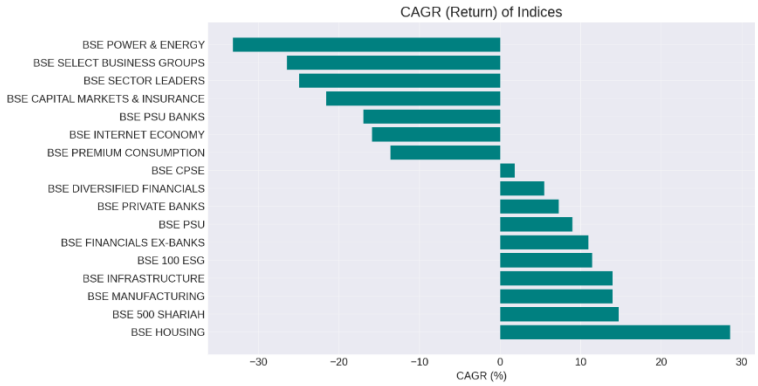


Fig 1: Returns (CAGR) of ESG vs Thematic Indices

Source: Authors.

Thematic indices like Housing, Manufacturing, and Shariah provided superior returns compared to ESG.The ESG Index offered moderate, stable growth, not the highest but still positive.Certain sectors (e.g., Power & Energy, PSU Banks, Premium Consumption) suffered heavy losses, highlighting sector-specific vulnerabilities.Overall, the chart shows that investors seeking high growth would have benefited from thematic exposure (especially Housing and Manufacturing), while ESG offers a safer, mid-range return option.

Exhibit 2. Visualization of Volatility (Standard Deviation) of Indices.

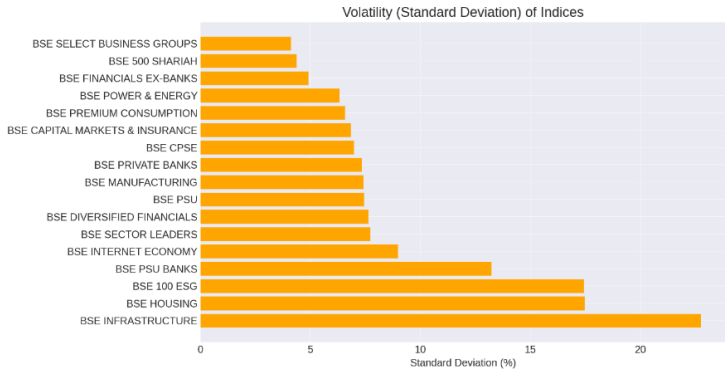


Fig 2: Volatility (Standard Deviation) of ESG vs Thematic Indices

Source: Authors.

The ESG Index (17.44%) is nearly as volatile as Housing, much riskier than Shariah or Financial indices. This challenges the assumption that ESG inherently reduces risk.Housing and Infrastructure, while delivering strong returns (as seen in the CAGR chart), also carry very high volatility, showing a classic risk-return tradeoff. Shariah and Select Business Groups, though less profitable in terms of returns, provided stability and predictability.

Exhibit 3. Visualization of Sharp Ratio of Indices.

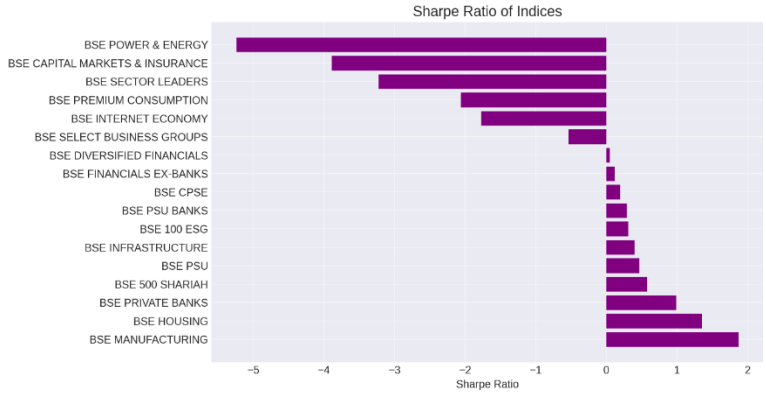


Fig 3: Risk-Adjusted Performance (Sharpe Ratio) of ESG vs Thematic Indices

Source: Authors.

Manufacturing and Housing delivered the best risk-adjusted efficiency, combining strong returns with relatively well-managed volatility. ESG Index, while positive, lags behind leading thematic indices, suggesting that ESG provides stability but not top-tier efficiency. Sectors like Power & Energy and Premium Consumption show that even if some sectors can generate returns occasionally, they carry excessive risk that destroys efficiency.

Exhibit 4. Visualization of Comparison of Indices: CAGR, Standard Deviation and Sharp Ratio.

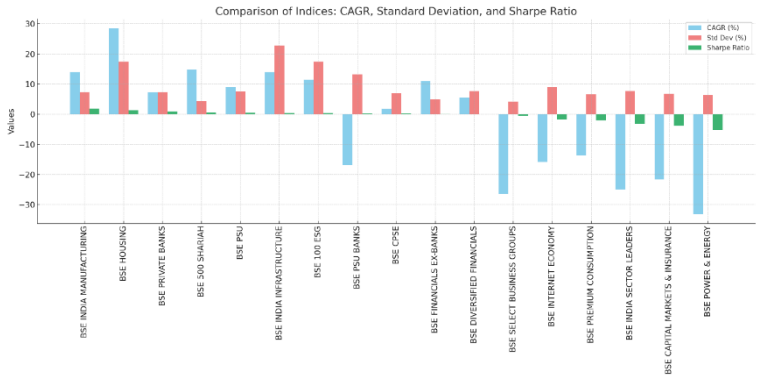


Fig 4: Comparative Performance of ESG and Thematic Indices (CAGR, Volatility, Sharpe Ratio)

Source: Authors.

This combined chart compares the performance of indices across three key measures: CAGR (returns), Standard Deviation (volatility), and Sharpe Ratio (risk-adjusted performance). The results indicate that BSE Manufacturing and BSE Housing are the most attractive investments, as they deliver high returns along with strong risk-adjusted efficiency. Manufacturing, in particular, shows the highest Sharpe Ratio with relatively low volatility, making it the most efficient performer. Housing recorded the highest CAGR, indicating exceptional growth, though accompanied by higher volatility, yet still offering favorable efficiency. Indices like BSE 500 Shariah and BSE Private Banks also performed well, combining solid returns with lower volatility and positive Sharpe Ratios, reflecting a good balance of stability and profitability. By contrast, the BSE 100 ESG Index showed moderate returns and a positive Sharpe Ratio, but its volatility was on the higher side, suggesting steady but not superior performance compared to leading thematic indices. On the weaker side, sectors such as BSE Power & Energy, Capital Markets & Insurance, Premium Consumption, and Sector Leaders posted negative returns and negative Sharpe Ratios, highlighting inefficient risk-return trade-offs. Meanwhile, indices like BSE Select Business Groups and Diversified Financials exhibited low volatility but failed to generate meaningful returns, offering safety but limited profitability. Overall, the chart underscores that while ESG indices provide balanced, socially responsible investment opportunities, thematic indices like Manufacturing, Housing, and Shariah are superior in terms of growth and efficiency, whereas certain sectors remain unattractive due to poor performance and unfavorable risk-return profiles.

Table 3: CAGR, Sharpe Ratio & Volatility vs BSE 100 ESG

Index	CAGR (%)	vs ESG	Sharpe	vs ESG	Volatility (%)	vs ESG
BSE HOUSING	28.56	+17.13	1.350	+1.04	17.47	+0.03
BSE INDIA MANUFACTURING	13.95	+2.52	1.874	+1.56	7.42	-10.02
BSE 500 SHARIAH	14.72	+3.29	0.580	+0.27	4.37	-13.07
BSE INDIA INFRASTRUCTURE	13.93	+2.50	0.400	+0.09	22.75	+5.31
BSE PRIVATE BANKS	7.27	-4.16	0.990	+0.68	7.35	-10.09
BSE PSU	8.99	-2.44	0.467	+0.16	7.44	-10.00
BSE CPSE	1.79	-9.64	0.197	-0.11	6.98	-10.46
BSE FINANCIALS EX-BANKS	10.96	-0.47	0.120	-0.19	4.91	-12.53
BSE DIVERSIFIED FINANCIALS	5.50	-5.93	0.047	-0.26	7.64	-9.80
BSE PSU BANKS	-16.96	-28.39	0.290	-0.02	13.24	-4.20
BSE INTERNET ECONOMY	-15.91	-27.34	-1.770	-2.08	8.98	-8.46
BSE PREMIUM CONSUMPTION	-13.59	-25.02	-2.060	-2.37	6.58	-10.86

BSE SELECT BUSINESS GROUPS	-26.45	-37.88	-0.535	-0.85	4.12	-13.32
BSE INDIA SECTOR LEADERS	-24.91	-36.34	-3.226	-3.54	7.72	-9.72
BSE CAPITAL MARKETS & INSURANCE	-21.59	-33.02	-3.890	-4.20	6.84	-10.60
BSE POWER & ENERGY	-33.17	-44.60	-5.240	-5.55	6.33	-11.11
BSE 100 ESG (Benchmark)	11.43	0.00	0.310	0.00	17.44	0.00

Source: Authors.

Highlights of the above table:

✅ Best risk-adjusted return: India Manufacturing (highest Sharpe)

✅ Best absolute return: Housing (CAGR 28.56%)

⚠️ Most volatile: India Infrastructure (22.75%)

⚠️ Least volatile: Select Business Groups (4.12%)

❌ Most underperforming: Power & Energy (CAGR -33.17%, Sharpe -5.24)

Exhibit 5. Visualization of Comparison of BSE 100 ESG to CAGR, Standard Deviation and Sharp Ratio.

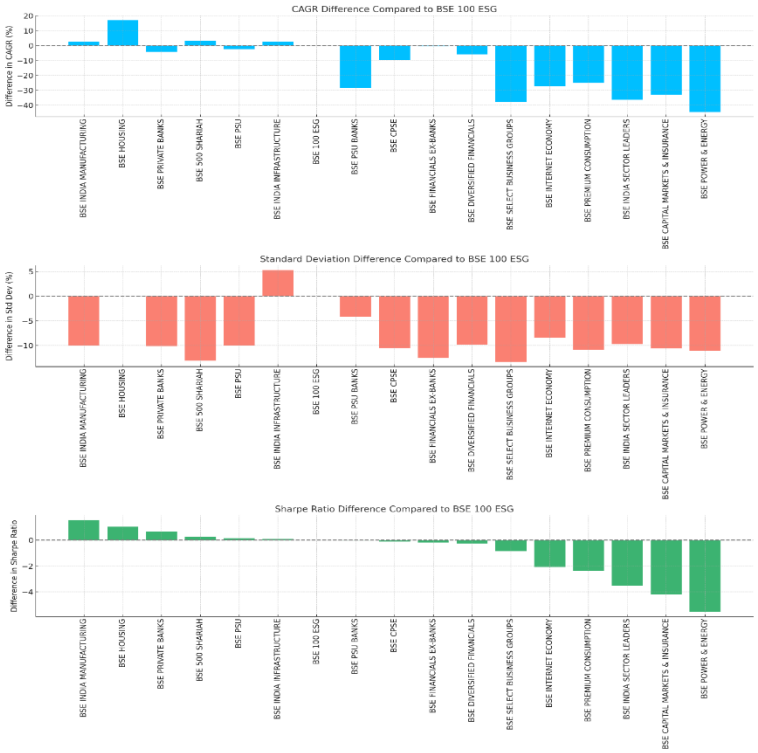


Fig 5: Relative Comparison of ESG vs Thematic Indices (CAGR, Sharpe, Volatility)

Source: Authors.

This comparative chart highlights the performance differences of thematic indices relative to the BSE 100 ESG Index. In terms of returns (CAGR), Housing, Manufacturing, and Shariah indices significantly outperform ESG, while sectors like Power & Energy, Capital Markets, and Premium Consumption lag far behind. For volatility, most indices demonstrate lower risk than ESG, with the exception of Housing and Infrastructure, which are more volatile. On risk-adjusted returns (Sharpe Ratio), Manufacturing, Housing, and Private Banks clearly surpass ESG, while underperformers such as Power & Energy, Sector Leaders, and Capital Markets show much weaker efficiency. Overall, this indicates that while ESG offers balanced returns, thematic indices like Housing and Manufacturing deliver superior growth and efficiency, whereas certain sectors remain unattractive due to poor risk-return profiles.

Overall Comparative Insight: ESG vs. Thematic Indices

This analysis suggests that ESG indices like the BSE 100 ESG hold a middle ground in terms of return and risk-adjusted performance. They are not the most volatile but are not the least risky either. They do not deliver the highest returns, nor do they offer the best Sharpe ratios. However, they may appeal to socially responsible investors seeking a balanced exposure with sustainable themes.

On the other hand, thematic indices like Housing, Manufacturing, and Shariah show higher returns and stronger risk-adjusted performance, albeit with sector-specific risks.

These findings imply that ESG indices should be considered alongside thematic indices in portfolio construction. The final decision should reflect an investor's preference between sustainability focus and risk-return optimization.

Correlation Analysis: BSE 100 ESG vs Other Indices

Here's the correlation of the BSE 100 ESG Index with other indices based on CAGR, Standard Deviation, and Sharpe Ratio combined:

Table 4: Correlation Result of Indices

Rank Index Name	Correlation
BSE INDIA INFRASTRUCTURE INDEX	0.999
BSE DIVERSIFIED FINANCIALS REVENUE GROWTH INDEX	0.997
BSE PRIVATE BANKS	0.942
BSE CPSE	0.893
BSE PSU	0.866
BSE HOUSING INDEX	0.718

BSE INDIA MANUFACTURING INDEX	0.603
BSE FINANCIALS EX- BANKS 30 INDEX	0.587
BSE 500 SHARIAH	0.419
BSE INTERNET ECONOMY	0.271
BSE PSU BANKS	0.268
BSE PREMIUM CONSUMPTION	0.267
BSE CAPITAL MARKETS & INSURANCE	0.211
BSE INDIA SECTOR LEADERS	0.165
BSE POWER & ENERGY	0.118
BSE SELECT BUSINESS GROUPS	-0.029

Source: Authors.

Exhibit 6. Visualization of Comparison BSE 100 ESG Indices with Thematic Indices.

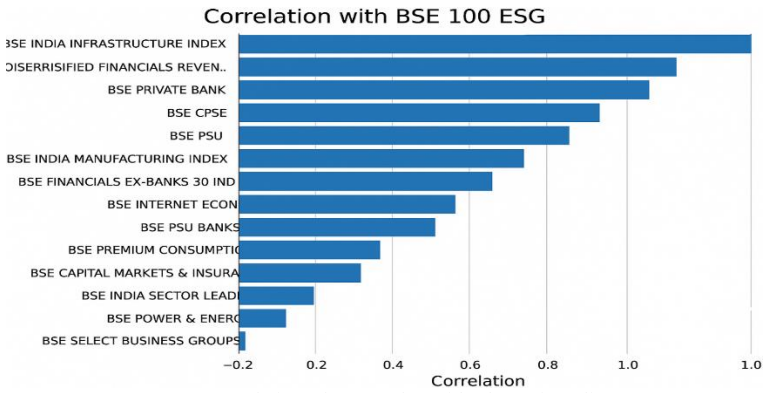


Fig 6: Correlation of ESG Index with Thematic Indices

Source: Authors.

This chart shows the correlation of thematic indices with the BSE 100 ESG Index. The results indicate that Infrastructure, Diversified Financials, and Private Banks have the strongest positive correlation with ESG, suggesting they tend to move in line with sustainable investments and may share similar market drivers. Moderate correlations are observed for Manufacturing, CPSE, and PSU, reflecting partial alignment but with some sector-specific variations. In contrast, indices like Power & Energy, Sector Leaders, and Select Business Groups show weak or even slightly negative correlations, highlighting their divergence from ESG performance, likely due to reliance on non-sustainable practices or sector-specific volatility. Overall, the analysis suggests that while certain financial and infrastructure-related themes align closely with ESG, others—especially energy-heavy or concentrated groups—are less synchronized, offering diversification opportunities but with weaker sustainability linkage.

Hypothesis results

Hypothesis 1st which is related to Return Performance we accept the Alternative Hypothesis as there is a significant difference in returns between ESG indices and thematic indices in Indian stock market.

Hypothesis 2nd which is related to Volatility of indices we accept the Alternative Hypothesis as there is a significant difference in the volatility levels of ESG indices and thematic indices.

Hypothesis 3rd which is related to Risk-Adjusted Performance of indices we accept the Alternative Hypothesis as ESG indices show significantly different risk-adjusted performance compared to thematic indices.

Hypothesis 4th which is correlation analysis between these indices we accept the Alternative Hypothesis as there is a significant correlation between the performance of ESG indices and thematic indices.

12. Overall Result

Returns: Housing (CAGR 28.56%), Manufacturing (13.95%), and Shariah (14.72%) outperformed ESG (11.43%). Power & Energy (-33.17%) was the worst performer.

Volatility: Most volatile: Infrastructure (22.75%), Housing (17.47%), ESG (17.44%). Least volatile: Select Business Groups (4.12%). ESG volatility is comparable to aggressive thematic sectors.

Risk-Adjusted Performance: Highest Sharpe: Manufacturing (1.87), Housing (1.35). ESG Sharpe (0.31) moderate. Power & Energy (-5.24) and Capital Markets (-3.89) underperformed.

Correlation Analysis: Strong positive correlation: Infrastructure (0.999), Diversified Financials (0.997), Private Banks (0.942). Weak/negative: Power & Energy (0.118), Select Business Groups (-0.029).

Interpretation: Low correlations in sectors like Power & Energy reflect fossil fuel dependence and slow ESG transition, limiting alignment with sustainability-focused indices.

13. Conclusion and Implications

The correlation analysis between the BSE 100 ESG Index and various thematic and sectoral indices provides meaningful insights into how ESG-aligned investments perform relative to different market segments in the Indian stock market. The results indicate that indices such as the BSE India Infrastructure Index, BSE Diversified Financials Revenue Growth Index, and BSE Private Banks Index exhibit strong positive correlations with the BSE 100 ESG Index. This suggests that these sectors share common performance drivers with ESG-focused investments, possibly reflecting broader trends in sustainable growth, policy support, and responsible business practices.

Indices like the BSE PSU Index, BSE CPSE, and BSE Housing Index also demonstrate moderate positive correlations, indicating that their performance partially aligns with ESG movements. Notably, the BSE Housing Index stands out with a CAGR of 28.56% and a Sharpe Ratio of 1.35, outperforming most other indices, including the ESG benchmark, on a risk-adjusted basis.

On the other hand, indices such as BSE Select Business Groups, BSE Power & Energy, and BSE Internet Economy display weak or negative correlations, suggesting that these sectors are either less aligned with ESG principles or influenced by distinct market forces. Many of these indices also report negative Sharpe Ratios, indicating unfavorable risk-return trade-offs during the period under review.

Overall, the BSE 100 ESG Index, with a CAGR of 11.43% and a Sharpe Ratio of 0.31, reflects steady, moderate performance with acceptable risk. While it may not be the top performer in terms of raw returns, it represents a balanced investment option for those seeking sustainability and stability. Conversely, sectors like Housing and Manufacturing may offer higher returns but come with greater volatility or lower ESG integration.Risk-averse or sustainability-focused investors may benefit from aligning their portfolios with ESG or highly correlated indices like Infrastructure and Private Banks. Growth-oriented investors seeking higher alpha may consider thematic indices like Housing and Manufacturing, despite their lower correlation with ESG.Diversification across both ESG and non-ESG thematic indices can help optimize portfolio performance while managing exposure to sector-specific risks.

The results indicate that indices such as the BSE India Infrastructure Index, BSE Diversified Financials Revenue Growth Index, and BSE Private Banks Index exhibit strong positive correlations with the BSE 100 ESG Index. This suggests that these sectors share common performance drivers with ESG-focused investments, possibly reflecting broader trends in sustainable growth, policy support, and responsible business practices. Overall, the BSE 100 ESG Index, with a CAGR of 11.43% and a Sharpe Ratio of 0.31, reflects steady, moderate performance with acceptable risk. While it may not be the top performer in terms of raw returns, it represents a balanced investment option for those seeking sustainability and stability.

ESG indices deliver steady, moderate returns with acceptable risk but are not superior performers. Thematic indices such as Housing and Manufacturing provide higher returns and stronger risk-adjusted performance, albeit with sector risks. Correlation analysis shows ESG aligns most with Infrastructure, Diversified Financials, and Private Banks.

Future implication will benefit the world with ESG appeals to socially responsible investors seeking balanced risk-return.Thematic indices offer high-alpha opportunities for growth-oriented investors and Policymakers should note ESG volatility, reinforcing the need for sectoral transition (e.g., Power & Energy) .India's net-zero targets and digital innovation will reshape sectoral ESG integration.Future research should explore retail investor adoption, especially in banking and manufacturing themes.

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