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Performance Analysis of ESG Indices: A Step towards fulfilling Social Responsibility

The study fully comprehends the success of socially conscious investors on investment returns. The purpose of this paper is to compare the risk/return along with the market performance of ESG Indices of India with the conventional parent index Nifty. The analysis is accessed by applying CAPM (Capital Asset Pricing Model).Sharpe ratio and Treynor ratio are applied in order to compare the performance of the ESG indices with their benchmark Index Nifty. The results confirm that the ESG indices outperform the conventional Index Nifty and give more favorable risk-adjusted returns than the conventional Index.

Keywords: ESG (Environment, Social, Governance) investments, Socially Responsible Investments(SRI), ESG Index, India, Nifty, Capital Asset Pricing Model (CAPM).

Introduction

With the involvement of environmentally conscious and efficient operational strategies, sustainable investments have maintained a balance between financial investments and social responsibilities. A tremendous transformation has been seen in the financial landscape over the 21st century, in the form of exponential growth in environmentally conscious strategies in the field of investments (Ferrat *et al.,* 2021).The introduction of

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ESG dimensions acted as an official approach for those who are conscious of the environment and have awareness towards society. ESG concept played a crucial role in transforming such investors to be known as 'Socially Responsible Investors' and played a significant role in catalyzing the transition towards 'Socially Responsible Investments'. The fundamental principle behind ESG investing is identifying and assessing the intangible value that is possessed by environmentally friendly and socially responsible companies, with vigorous governance policies in every step of their day-to-day operations. It is assumed that such firms exhibit risk management measures better on ESG parameters, creating the value for long-term sustainable investments (Hariharan and Babu, 2018). Global Sustainable Investment Alliance (GSIA) states the screening method on which ESG is based on. The screening excludes the corporations with controversial practices and the selection of those corporations which are stellar ones related to sustainable practices (GSIA, 2018). In developed countries like Europe and the United States, where above twenty percent of professionally managed assets account under SRI (Ferrat *et al.,* 2021), it is regretting that the concept of ESG has been largely unsearched for emerging economies like India (Chelawat and Trivedi, 2016). The gap of lagging behind in the field of SRI from the other developed nations can be sighted in the inception of SRI in the financial markets. Pax World Fund was the 1st SRI mutual fund created in 1971 for those investors who avoided investing in companies supporting the Vietnam War. Whereas Domino 400 social index was the 1st SRI index (currently MSCI KLD 400 Social Index) launched in the year 1990 whereas the 1st ESG index in the world was launched in the year 1999 globally (The Dow Jones Sustainability World Index was launched by S&P DJI). India lagging far behind the developed nations launched its 1st ESG index, named S&P ESG India Index, in the year 2008 in Mumbai. Further, in 2013, it was deactivated (Saxena and Singh). Currently, various ESG indices have been launched in India, such as NSE ESG, NSE ENHANCED ESG, BSE CARBONEX etc. and are active in the financial market but, still need to seek the attention of the investors which can invariably be drawn through more and more empirical research studies on these ESG Indices.

Literature Review

ESG investment performance appears a sensitive issue and a matter of debate among

investors who foresee a decline in performance as compared to non-ESG and many others who believe the contrary may happen. According to the opponents, theoretical justification for adopting ESG screens would inevitably result in a smaller investment universe and less effective diversification (Rudd, 1981; Barnett and Salomon, 2006; Renneboog *et al.,* 2008). It appears that shrinking the investment universe is akin to an investment limitation that may cause potential performance degradation (Adler and Kritzman, 2008). Additionally, limiting portfolios to businesses that meet ESG standards and norms is likely to increase the exposure towards specific potential vulnerabilities (e.g., industry biases, style biases). (Rudd, 1981; Kurtz, 1997; Kurtz and DiBartolomeo, 1999). ESG advocates and supporters, however assert that extra-financial components of investments have a role in investing decisions even if they can be challenging to describe, measure and are generally distinctive to each investment (Theo and Shiu, 1990; Bassen and Kovacs, 2008). While there is unanimous understanding regarding the risk reduction advantages of ESG investing, the extensive body of empirical studies that have examined ESG investment performance can be categorized into three different groups:

i) Those who demonstrate ESG's outperformance (Consolandi *et al.,* 2009; Renneboog *et al.,* 2008).

ii) Those who demonstrate that ESG is indifferent to performance. (Naffa and Fain, 2021; Hartzmark and Sussman, 2019; Managi *et al.,* 2012) and

iii) Those who infer that ESG causes underperformance (Adler and Kritzman, 2008; Berlinger and Lovas, 2015).

One of the significant doubts that are addressed by the investor regarding SRI is whether these investments generate better returns than the conventional ones or what is the level of risks of such investments, whether high or low from the latter ones. Several international studies have been comparing socially responsible funds' performance to conventional funds' performance (Bauer *et al.,* 2005; Renneboog *et al.,* 2008). Scholars, Bechchetti and Ciciretti (2006) and Manescu (2010) analysed the performance of the Domini Social 400 Index. Researchers, Hoti *et al.* (2005) and Benson *et al.* (2010) analysed the risk/return and put forward a comparative performance analysis of sustainability indices (Dow Jones

Sustainability Index) with their benchmark of the conventional index, as they were launched on a country wide as well as global level. The above studies found that SRIs do not perform well when compared to the conventional investments.

De and Clayman (2015) discovered a stronger relationship between stock ESG rating and risk-adjusted performance for 2007 to 2012. This outcome might be explained by the low-risk or volatility impact, which is the exceeding or outperformance of companies which were less volatile, as pointed out in the literature (Ang *et al.,* 2006; Haugen and Baker, 1991; Jagannathan and Ma, 2003). The authors also find a favourable ESG effect separate from the low-volatility irregularity. Kanuri (2020) pointed out that ESG funds occasionally beat conventional funds, but over a long term period, conventional funds are seen to outperform ESG funds. Whereas, Cornell and Damodaran (2020) stated that ESG ratings are indifferent if linked to higher risk-adjusted returns. Statman and Glushkov (2009) claimed that if positive screening - the selection of stocks with the highest ESG ratings - is combined with negative screening - the exclusion of stocks with negative ESG ratings- their effects will balance one another out and ESG indexes will perform similarly to conventional indexes. Using an ESG factor created from multiple ESG evaluations, Lioui and Tarelli (2021) revealed that ESG investment has produced strong positive alpha over the past few decades, with a cumulative alpha exceeding 1% annually for the E as well as S pillars. These findings confirm the thesis put forth by Edmans (2011) and Gong and Grundy (2019), that "firms can do well by doing good." The outperformance, however, exhibits a downward-sloping pattern, according to Lioui and Tarelli (2021). In their compilation of 2000 empirical studies from 1970 to 2014, Friede *et al.* (2015) did not find any negative impact of ESG parameters on risk-adjusted performance. An empirical study on ESG performance was also conducted by Coqueret (2021). Bruno *et al.* (2022); Lee *et al.* (2021); De Franco (2020); Yue *et al.,* (2020); Brunet (2018); Hvidkjaer (2017); Trinks and Scholtens (2017); and Kumar *et al.* (2016), among others, have produced results that are consistent and similar. This paper highlights the risk/return and performance of the ESG indices of India. Prior research (empirical or theoretical) for Indian Socially responsible investments and ESG investments has been contributed by various researchers. Mandal & Murthy (2021) put forward a theoretical study concerned with regulations and gaps in

implementing the ESG practice practically in India. Jain and Mehrotra (2021, a) & Jain and Mehrotra (2021, b) carried out the risk/ return study for the socially responsible companies of India, finding it imperative for the investors to be aware of these socially responsible investments and know the level of risk and return they pursue. Sudha.S (2014) and Tripathi and Bhandari (2015), in their empirical study, stated that the ESG indices of India outperform the conventional index. Hariharan and Babu (2018) studied the volatility of ESG indices and found that the ESG indices of India are less volatile than the conventional parent index. Gupta and Goldar (2005) carried out their study for the 1st dimension of ESG, 'E' using the Green Ratings of Indian companies and found that companies with lower ratings reported negative abnormal returns and further Srinivasan and Singh (2010) analysed the correlation of the same with the company's goodwill found that the 'E' factor does not generate importance to such short period assessments. Deepmala and Pandey (2021) claimed that the lack of regulatory requirements which provide information on sustainability acts as one of the barriers for the country to move a step forward in the field of ESG investments. The varied works of literature contributed so far, by the researchers for India, carries one standard message: how these investments are accepted by the stakeholders is insufficient. This study adds to the literature the risk, return, volatility and performance of the ESG indices of India compared to the conventional index Nifty helping investors to take decisions in designing their investment portfolio.

Purpose of the study

The main purpose of the study is to compare risk-return and performance of selected ESG indices of India with the conventional parent Index.

Research Methodology

It is a Quantitative study which performs a comparative analysis between ESG Indices and the conventional Parent Index of India. NSE100 ESG INDEX and NSE 100 ENHANCED ESG INDEX were taken as dependent variables, and Nifty Index was determined as the independent variable for the study. To evaluate the performance of ESG Indices, daily returns of NSE100 ESG INDEX and NSE 100 ENHANCED ESG INDEX are considered for the period 1-4-2018 to 31-3-2022. (As the data for NSE 100 ENHANCED ESG Index

was available from 2018). Nifty was chosen as the benchmark index (Following Sudha. S, (2014), as it tracks the behaviour of India's most liquid and largest floating securities. These features make the Nifty Index most suitable to represent itself as a benchmark index and its risk/return and performance to be compared with the two former ESG Indices. The historical prices of all these indices were obtained from the NSE website. Capital Asset Pricing Model (CAPM) is used for analyzing the risk/returns. Further Sharpe ratio and Treynor ratio are used to compare the performance of the ESG indices with the parent Index Nifty.

Sustainability risk can be defined as: "The volatility of the returns to the sustainability index" Sudha (2014). CAPM is a simple single-factor OLS regression model used to estimate the expected returns on risk-bearing assets. It was introduced by Sharpe (1964), Lintner (1965) and Mossin (1966) by following the original framework of Markowitz (1952).

CAPM has three basic and important assumptions (Cardoso, 2019):

1. Investors may trade the securities in the stock market with no transaction costs or incurring any taxes. Additionally, they may lend and borrow at risk-free rate of return (Markowitz, 1952).
2. The investors keep a hold on efficient portfolios only that gives maximum expected returns for a particular level of volatility''.
3. The main aim of investors is to achieve the optimum returns. i.e. Maximum returns at minimum risk.

   This study intends to compare investments of sustainable indices with that of the conventional broad market index in the Indian stock market. Despite constructing an individual portfolio of sustainable companies, this study directly investigates the ESG indices. Therefore; the Market model or CAPM regression model fits best for the analysis and the use of Fama French three- factor model and Carhart's model is not relevant. CAPM model considers only the systematic risk, also known as a market risk, because it is presumed that unsystematic risk is eliminated due to

portfolio diversification. Many researchers (Hamilton *et al.,* 1993; Schroder, 2007; Ortas *et al.,* 2010; and Sudha, 2014) have applied this model to their sustainable studies. CAPM captures the systematic risk; Beta that reflects the vulnerability of the portfolio to that of the market return. CAPM is the most extensively used in the research field of finance because of its simple framework. The model is empirically described as follows:

$$E(ri) = RF + \beta (E(Rm) - RF)$$

Where E (ri) = the expected rate of return of an index,

RF = Risk-free rate (Based on the rate of 91 days Treasury bill)

β = measure of systematic risk,

E (rm) = the expected rate of return of the market.

The formulae of other statistical tools used in this study are as follows:

1. Daily Returns: The Daily returns of the Indices are calculated as follows

$$Ri = (Pt - Pt-1)/Pt-1 \times 100$$

Here: Ri = Index Return, P = Closing Price of the Index, t = Current Date, t-1 = Previous Day Date

2. Sharpe Ratio: Sharpe Ratio compares the investment return with its risk.

The formula for this ratio is as follows:

$$\text{Sharpe Ratio} = (RI - RF)/\sigma$$

Where RI = Return of Index, RF = Risk-free rate, σ = Standard deviation of the index excess return.

3. Treynor Ratio: Treynor Ratio determines the excess returns generated by the security per unit of the systematic risk. This ratio is calculated as follows:

$$\text{Treynor Ratio} = (Ri - Rf)/\beta$$

Where:

Ri =Return of Index, RF = Risk-free Rate of return, β = Systematic Risk

Data Analysis and Interpretation

SUMMARY OUTPUT		
Regression Statistics	NSE 100ENHANCEDESG	NSEESG
Multiple R	0.9873	0.987
R Square	0.974	0.975
Adjusted R Square	0.974	0.975
Standard Error	0.198	0.196
Observations	986	987

Table I: Regression Output (CAPM): R^2 and Anova

ANOVA	df		SS		MS		F		Significance F	
	NSEESG	NSEENCHANCED	NSEESG	NSEENCHANCED	NSEESG	NSEENCHANCED	NSEESG	NSEENCHANCED	NSEESG	NSEENCHANCED
Regression	1	1	1504.1	1513.8	1504	1513.8	38920	38263	0	0
Residual	985	984	38.066	38.93	0.039	0.0396				
Total	986	985	1542.2	1552.8						

Table II: CAPM Alpha and Beta

Particulars	Indices	Intercept (α)	Excess returns (nifty) (β)
Coefficients	NSEESG	0.0079	0.9604
	NSEENCHANCED	0.0067	0.9629
Standard Error	NSEESG	0.0063	0.0049
	NSEENCHANCED	0.0063	0.0049
t Stat	NSEESG	1.2651	197.2819
	NSEENCHANCED	1.0547	195.6101
P-value	NSEESG	**0.2062**	**0.0000**
	NSEENCHANCED	**0.2918**	**0.0000**
Lower 95%	NSEESG	-0.0044	0.9508
	NSEENCHANCED	-0.0058	0.9532
Upper 95%	NSEESG	0.0202	0.9699
	NSEENCHANCED	0.0191	0.9726

Table III: Performance Analysis

	NSEESG	NSEENHANCEDESG	NIFTY
CAGR	16.06%	15.83%	14.36%
RF	6.05%	6.05%	6.05%
Annualized STD DEV	19.84%	19.92%	20.42%
Beta	0.960	0.963	1.000
Sharpe ratio	0.505	0.491	0.407
Treynor ratio	0.104	0.102	0.083

Table I shows the R^2 values for the two indices NSE100ENHANCEDESG and NSE100ESG, respectively. The values 0.974 and 0.975 determine that the independent variable explains approx. 97% of variance in both indices. The R^2 value shows that the CAPM model fits excellent to the data. Table 2 shows the Alpha and Beta values. The alpha value for Nse100esg and nse100 enchanceesg is positive (nseesg 0.0079, nseenchanced 0.0067), showing positive risk-adjusted returns, but the p-value of alpha for both the indices is higher than 0.05 (nseesg: 0.2062, nse100enchancedesg: 0.2918) therefore, alpha for both the indices is insignificant and has no sense. Beta value of both the indices is (nseesg 0.9604, nse100enchancedesg 0.9629) positive. Beta close to one, means the fluctuation the dependent indices is unidirectional with the movement of parent conventional index Nifty. Movement of these stocks majorly depends on the movement of the market. If the market goes up by 1%, then both the indices move 0.97 times upwards and vice versa. Also, the p-value for both the indices (NSE ESG 0.000, NSE100ENHA NCEDESG 0.000) is lower than 0.05, which means, the systematic risk for both the indices is significant. Table III describes the Compounded Annual Growth (CAGR). Both the ESG indices show more returns than the parent index Nifty. The annualized standard deviation shows, that the conventional index nifty bears more risk than the ESG indices. The Sharpe ratio of the ESG indices is higher than the Nifty index, indicating that they are better investment options than Nifty. Furthermore! The Treynor ratio is again higher for both the ESG indices, indicating that they give more favorable risk-adjusted returns than the parent

index Nifty. The results show that the ESG indices outperform the Conventional index in India, giving better risk- adjusted returns. Our results go in line with Renneboog *et al.* (2008), Consolandi *et al.* (2009), Sudha.S (2014) and Tripathi and Bhandari (2015).

Summary and Conclusions

This study has been carried out to compare the risk/return and performance of ESG indices of India with the conventional index. The representative sample consists of NSE100ESG Index, NSE100ENHANCEDESG Index as the dependent variable and Nifty as the independent variable. The data for four years (2018-2022) was taken from the website of the NSE (National Stock Exchange).

The statistical tools used for comparative analysis are CAPM, Standard Deviation, Sharpe ratio and Treynor Ratio. The R^2 value of 0.97 for both the ESG Indices shows that the CAPM is 'Good to Fit' on this data. The alpha values for both the ESG indices are positive, but they are insignificant. On the other hand, the systematic risk, Beta, for both the indices is positive and significant. The volatility of both the ESG indices is similar to the parent index Nifty and fluctuates in the same direction as the Conventional index Nifty moves. The annual growth rate for both the ESG indices is superior to the Nifty shows, they give more annualized returns. The standard deviation of Nifty is more than the ESG indices means the investor bears more risk if one invests in Nifty rather than investing in other two indices. The Sharpe ratio of both the ESG indices is more than the parent index Nifty shows that the ESG Indices are better investment options than Nifty. The higher Treynor ratio of both the ESG indices compared to the conventional index Nifty shows that ESG indices give more favourable risk-adjusted returns. From the above study, we conclude that The ESG Indices of India outperform the Conventional index. They bear the low risk and generate higher returns than the conventional index Nifty. The volatility of ESG indices is unidirectional with respect to the conventional index. The ESG indices generate better risk-adjusted returns in comparison to the conventional index Nifty. Although India lags behind the developed nations like USA, UK, and Europe, where ESG Investments have created a plethora in the financial mainstream, the performance of the Indian ESG indices, is outstanding in comparison to the conventional index. This study puts forward the accurate picture that in the Indian stock market, ESG investments have outperformed the

conventional investments. By investing in ESG indices the investor gets more favorable risk adjusted returns. The results provide a factual support to be committed towards the environment and society which in turn can help the investors in framing the investment plan and to manage the portfolio smoothly.

'Earning Better by Doing Good' by investing in ESG Indices is an excellent option. On the one hand, investor gets outstanding risk-adjusted returns, and on the other hand, he/she fulfills a part of their social responsibility. This study helps to understand the change in the growth of SRI in the form of returns realized. India and many other developing countries should get motivated towards these types of socially responsible investments by more and more empirical research in this context. These results create awareness among the investors, brokers and various fund managers to frame a socially responsible portfolio (in the form of ESG indices) and include them in their investments.

Limitations of the Study

The study is limited to the ESG indices of India. The period of the study is four years. Since one of the ESG indices (NSE 100 ENHANCED ESG INDEX) was launched in the year 2018 so data availability was 4 years.

Scope for Future Research

Future study can be extended to more developed nations. Also, a comparative study of the performance of ESG Indices between developed and developing countries can be carried out.

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