

Growth and Performance Measurement of ESG-themed Mutual Funds in India: An Empirical Investigation

Shikha Gupta

Associate Professor, Department of Commerce, Shabeed Bhagat Singh College, University of Delhi, Delhi.

E-mail: shikha.gupta1@sbs.du.ac.in

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Abstract: The world is witnessing a stupendous rise in Environmental, Social, and Governance (ESG) investment practices due to changing dimensions of risks and consequent clamour for the adoption of sustainable practices. In this scenario, ESG-themed mutual funds have provided an alternative route to ESG investing. This study aims to analyse the growth of ESG mutual funds in India and evaluate their performance using standalone return and risk measures as well as widely recognised risk-adjusted measures, namely, Sharpe Index, Treynor Ratio, Sortino Measure, and Jensen's Alpha. With respect to growth, the study found that the industry is still in its infancy though a steady and positive momentum is seen both in terms of number as well as assets under their management. Without taking into account the social perks of sustainable investment, the results of the performance analysis revealed Quant ESG Equity Fund to be the best performer. Interestingly, the study also found that all the sample funds have 'beaten the market' and earned superior returns. The findings of the study substantiate that ESG investing not only leads to the accomplishment of sustainability goals of investors but also affords them returns higher than the traditional route to investing.

1. Introduction

Society never ceases in its pursuit of growth. However, with growth not only comes opportunities but also challenges. These challenges have given rise to sustainable development practices and adherence to ESG in recent years.

ESG is a philosophy that incorporates environmental, social, and governance factors in business and investment decisions. It originated from the term "responsible investment". At the heart of ESG-based investing is the recognition that global challenges such as climate change, biodiversity loss, unemployment, terrorism, and data privacy and protection are creating newer risks for business enterprises. Only those businesses which consider and discount these risks in their business models would be able to sustain in the long term. In this scenario, an ESG investor evaluates the performance

of an enterprise not just based on financial parameters but also on non-financial metrics which involves an assessment of ethical, responsible, and eco-friendly practices adopted by it. Moreover, numerous research studies have substantiated that those businesses that incorporate ESG factors in their core corporate strategy are able to enjoy reputational advantages and better profit margins in the long run (Govindarajan and Amilan, 2013; Laskar and Maji, 2017). Thus, through ESG-based investing, investors not only aim to do their bit in promoting sustainability but also expect to earn higher returns in the long run.

1.1. ESG Mutual Funds: A Route to ESG Investing

ESG mutual funds are thematic funds that seek to invest in socially responsible companies that perform well on ESG parameters. To construct its portfolio, a fund can adopt several investment approaches with varying complexity and comprehensiveness. The ‘exclusionary or avoidance’ approach excludes investment in companies that are engaged in the production of lethal weapons, tobacco, alcohol or are embroiled in major controversies involving social values or violation of ethical standards. The ‘inclusionary screening’ approach pursues the inclusion of companies that are compliant with international norms of ESG philosophy such as sustainable development goals. This also includes a ‘best-in-class’ approach where the focus is to invest in companies that achieve above certain ESG score thresholds. Sometimes, investment is made in “low ESG score companies that show high propensity to transition to higher ESG, and/or where the fund engages in shareholder activism through voting to change company behaviour and practices” (Boffo and Patalano, 2020). The approaches are not mutually exclusive and fund houses could simultaneously apply more than one approach for portfolio construction and/or management. Here, the emphasis is on long-term value creation rather than short-term opportunism.

In recent years a considerable number of ESG investors have routed investments through ESG mutual funds owing to its obvious advantages. An investor may want to contribute to sustainable investment but may not have expertise or access to sophisticated data analysis techniques to assess the companies on ESG parameters. Mutual funds provide this expertise and have advantages over direct investment such as diversification, small capital investment, etc. This has led to the huge popularity of ESG funds globally. For instance, ESG funds recorded an inflow of \$649 billion worldwide in 2021 as compared to \$542 billion and \$285 billion in 2020 and 2019, respectively (Kerber and Jessop, 2021). In India too, ESG momentum is picking up at a fast pace with many ESG-themed products being launched by the industry. In this scenario, evaluation of the growth of Indian ESG mutual funds and their performance is an issue of research worth exploring.

2. Review of Literature

Assessment of mutual fund industry has received considerable attention from researchers and practitioners across the world. This section reviews the literature on the performance evaluation of traditional funds and thereafter, sustainable funds.

Friend *et al.* (1962) conducted a comprehensive study of 152 US mutual funds from 1953 to 1958 and found no evidence that they were able to earn superior returns than the benchmark index. The

study also attempted to explore the relationship between portfolio turnover, expense ratio, and returns and found no strong association.

Sharpe (1966) in his pioneering study of 34 open-ended mutual funds over a span of 9 years (1954-1963) found an approximately linear relationship between fund returns and variability. His research led to the development of the reward-to-variability ratio which is a well-accepted performance evaluation tool even today. The ratio could be also used to rank the funds in order of their performance.

Treynor and Mauzy (1966) studied a sample of 57 open-ended balanced and growth funds from 1953 to 1962 to examine whether managers were able to 'outguess' the market and adjust their portfolios accordingly. The study did not find any statistical evidence that managers possess that ability and therefore concluded that they should not be held accountable for not foreseeing the market fluctuations. However, that does not mean that managers cannot provide investors with better than market returns. It would, however, be due to their ability to identify under and over-priced companies and take appropriate steps rather than an ability to 'outguess' it.

Jensen (1968) conducted a study to analyse whether the funds were able to outperform the market due to the superior selectivity skills of fund managers. The returns of 115 open-ended mutual funds from 1955 to 1964 were evaluated by regressing excess fund returns with excess market returns with given systematic risk. Using Capital Asset Pricing Model (CAPM), he developed a performance evaluation model called 'Jensen's Alpha'. Since this model assumes that a fund's systematic risk remains stationary, its performance is a result of the fund manager's selectivity skills exclusively. Jensen's alpha is considered a prominent selectivity performance measurement model.

Fama (1972) developed another selectivity performance measure called 'Fama Decomposition Model'. The model suggested that the observed return from a fund can be attributed to the superior stock selection abilities of a fund manager (selectivity) as well as his ability to predict and time the market (market timing). Selectivity can further be broken down into net selectivity and compensation for diversification.

Van *et al.* (2001) attempted to evaluate the performance of mutual funds when the return distributions are skewed and discovered that the classic Sharpe Ratio yields unsatisfactory results in such situations. On the basis of the Put Strategy Simulation Study, they were able to substantiate that downside risk is a better barometer of performance and propounded 'Sortino Measure' as a performance evaluation tool.

Bhuva and Bantwa (2020) evaluated the performance of selected large and mid-cap mutual fund schemes between 2007 and 2011 using average returns and measures like Sharpe, Treynor, Jensen, and Fama. With an exception of two, all the sample funds performed better than the market although they were exposed to higher risk. No significant difference was found in the returns of large-cap and mid-cap funds in the long term.

Since the present study specifically deals with the performance evaluation of sustainable mutual funds, the earlier studies in this area are discussed as follows.

Naffa and Fain (2020) examined whether investors should invest in sustainable funds to achieve their sustainability goals without sacrificing returns. The study covered a period of 4 years from 2015 to 2019 and found that these funds generate superior risk-adjusted returns even after discounting for

transaction costs. Further, these funds do not suffer from under-diversification because of the adequate size and liquidity of capital markets.

Yue *et al.* (2020) examined whether an investment in sustainable funds creates additional risks in investing. Through quantitative analysis, the study attempted to compare the performance of 30 sustainable and 30 traditional funds. Annual returns, standard deviations, and risk-adjusted measures like Sharpe, skewness, and kurtosis were computed and analysed. It was found that although sustainable funds were not riskier as compared to traditional funds, no evidence suggests that these funds generate superior returns, vis-à-vis, traditional funds or even a benchmark index. These findings were consistent with the findings of Bauer *et al.* (2005), Kreander *et al.* (2005), and Renneboog *et al.* (2011) who were not able to determine whether sustainable or traditional investments were more profitable.

Apart from the above-mentioned studies, literature on specific ESG fund performance was found to be extremely limited in number. Moreover, not a single research study was found in the Indian context which gives rise to the research gap and led to the present study.

3. Objectives and Hypotheses of the Study

3.1. Objectives of the Study

To fill the research gap, this study attempts to achieve the following objectives:

- To assess the growth in the number and Assets Under Management (AUM) of ESG funds in India.
- To evaluate the performance of ESG equity funds on the basis of annualised returns, portfolio total risk, downside risk, beta; and risk-adjusted return measures such as Sharpe, Treynor, Jensen's alpha, and Sortino.

3.2. Hypotheses of the Study

Keeping in line with the objectives, the following hypotheses are framed:

- H_{01} : The growth of ESG mutual fund industry is (not) significant in India.
- H_{02} : Performance of ESG mutual funds is (not) significantly divergent from each other.
- H_{03} : Performance of ESG mutual funds is (not) significantly divergent from the benchmark index.

4. Research Methodology

The study is empirical in nature and utilises secondary sources of information for analysis. Various parameters such as the number of ESG funds launched in the Indian market over the years, total inflows into the sector, and AUM have been used to assess the growth of this sector. For this, the data has been sourced from the SEBI and other reports and websites.

There were eight ESG-themed funds in India as of December 31, 2021 which form the sample for this study. The details of the schemes are provided in table 1. The performance of each fund has been analysed for two periods, namely: (i) for the year 2021 (i.e., from January 1, 2021 to December 31, 2021), and (ii) from the inception of each fund till December 31, 2021. To construct their performance metrics, the study uses daily Net Asset Value (NAV) data obtained from the Association of Mutual Funds of India (AMFI) official website.

National Stock Exchange (NSE)'s Nifty 50 has been used as a benchmark index to measure the funds' 'Alpha'. Nifty 50 represents the weighted average of the 50 largest Indian companies listed on NSE. The study uses the daily closing price for the corresponding period to compute market returns. To bring uniformity and afford calculations, only those dates were considered for which NAV as well as Nifty 50 closing price data was available. Suitable adjustments in line with accepted norms have been done here. The closing price data for Nifty 50 was extracted from NSE's official website.

Return of a fund in period i has been calculated as follows:

$$R_i = \frac{(S_i - S_{i-1})}{S_{i-1}} \quad (1)$$

Where

S_i = NAV of a fund at the end of period i

S_{i-1} = NAV at the end of period $i-1$.

A similar methodology is adopted in computing returns from the market by taking into account daily closing price data.

The cumulative returns of the fund as well as the market are annualised using the next mentioned formula.

$$R_p = ((1 + r_1) (1 + r_2) \dots (1 + r_n))^{1/n} - 1 \quad (2)$$

Where

R_p = Annualised returns of fund p

r_1, r_2, \dots, r_n = The returns in each period, and

n = Total number of periods in a year

The volatility of an investment is measured by the standard deviation of its returns which is a measure of total risk and is calculated as follows:

$$\sigma_i = \sqrt{\frac{1}{n-1} \sum_{i=1}^n (r_i - \bar{r})^2} \quad (3)$$

Where

σ_i = Total risk (standard deviation) of period i

r_i = Returns in each period

n = Total number of periods

To compare a fund's annualised returns with its standard deviation, the study annualised the standard deviation also by the following method:

$$\sigma_p = \sigma^* \sqrt{\text{number of trading days in a year}} \quad (4)$$

Where

σ_p = Annualised risk of fund p

Scaling factor 247 has been taken as the number of trading days in a year, which is the case with the Indian stock market.

An average investor is more concerned about the potential loss of his investment as depicted by downside deviation than the upside volatility. Downside deviation is defined as an estimation of volatility associated with negative fluctuations in case of a change in market conditions (Van *et al.*, 2001). It is measured as the square root of the sum of the squared deviation between actual and mean returns when the actual return is lower than the mean return. It is annualised as per the following method:

$$D_p = \sigma_d * \sqrt{\text{number of trading days in a year}} \quad (5)$$

Where

D_p = Annualised downside deviation of fund p

σ_d = Standard deviation of downside returns

Total risk can be classified as systematic risk (which cannot be diversified) and idiosyncratic risk (which can be diversified). Beta, which is a measure of systematic risk is defined as:

$$\beta_i = \frac{\text{cov}(R_i, R_m)}{\sigma_m^2} \quad (6)$$

Where

COV (R_i, R_m) = Covariance of fund returns and market returns

σ_m^2 = Variance of market returns

Moreover, the study uses four risk-adjusted performance measures, viz., Sharpe Index, Treynor Ratio, Sortino Measure, and Jensen's Alpha. The methodology adopted for these measures is detailed under performance analysis. For their computation, the average annual yield of 91-day treasury bills has been used as an approximation of risk-free asset. The data for 91-day treasury bills was obtained from the official website of the Reserve Bank of India.

5. Results and Discussion

5.1. Growth of ESG Funds in India

Globally, sustainable investments are on the rise. According to a report by the United Nations Principles for Responsible Investment (PRI, 2022), the number of PRI signatories who commit to the philosophy of sustainable investment surpassed 3,500 across the world in 2021. Sustainable funds recorded a massive increase of 88% in 2021 alone with Europe accounting for almost 80%, followed by the US, Australia, and Canada (Sinha, 2021). It is expected that the AUM of ESG funds would grow to the US \$53 trillion by 2025 (Neroy, 2021).

As far as India is concerned, ESG investing presently is in a nascent stage. It has eight ESG-themed funds as of December 2021. The number is quite less compared to the number of funds in France (720), the US and the UK (more than 500 each), Japan (182), and China (119) (Figure 1).

However, in recent years, ESG funds in India are gaining momentum steadily. India had its first ESG fund in May 2018 when the erstwhile SBI Magnum Equity Fund dedicated itself to considering ESG issues in its portfolio construction and was rechristened as SBI Magnum Equity ESG Fund. Since then, seven new (refer table 1) ESG equity funds, one Exchange Traded Fund (Mirae Asset ESG

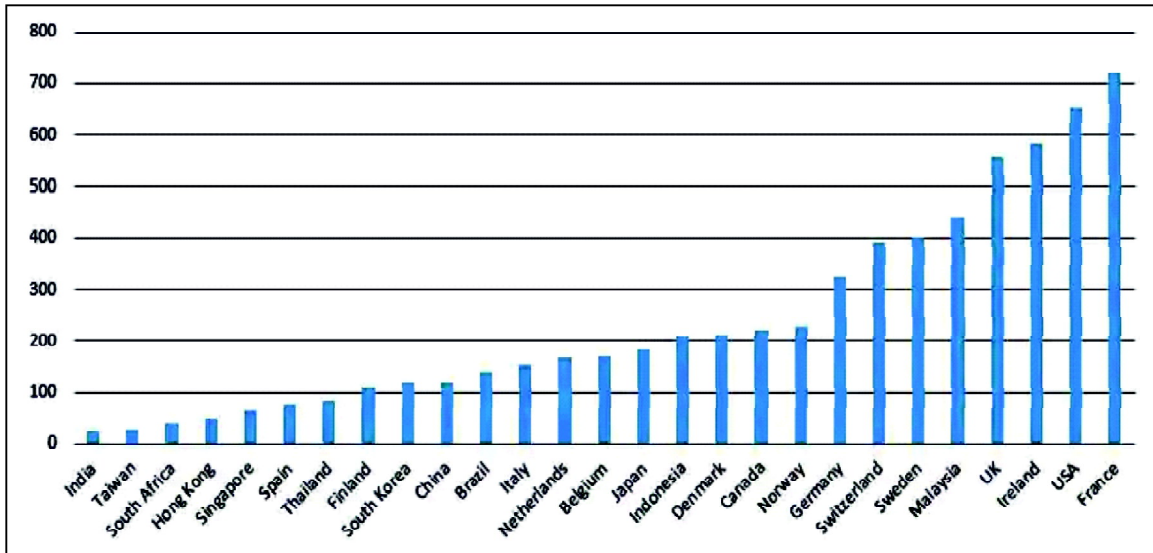


Figure 1: Number of ESG Funds in Major Countries

Source: Reuters cited in Murugaboopathy and Dogra (2021)

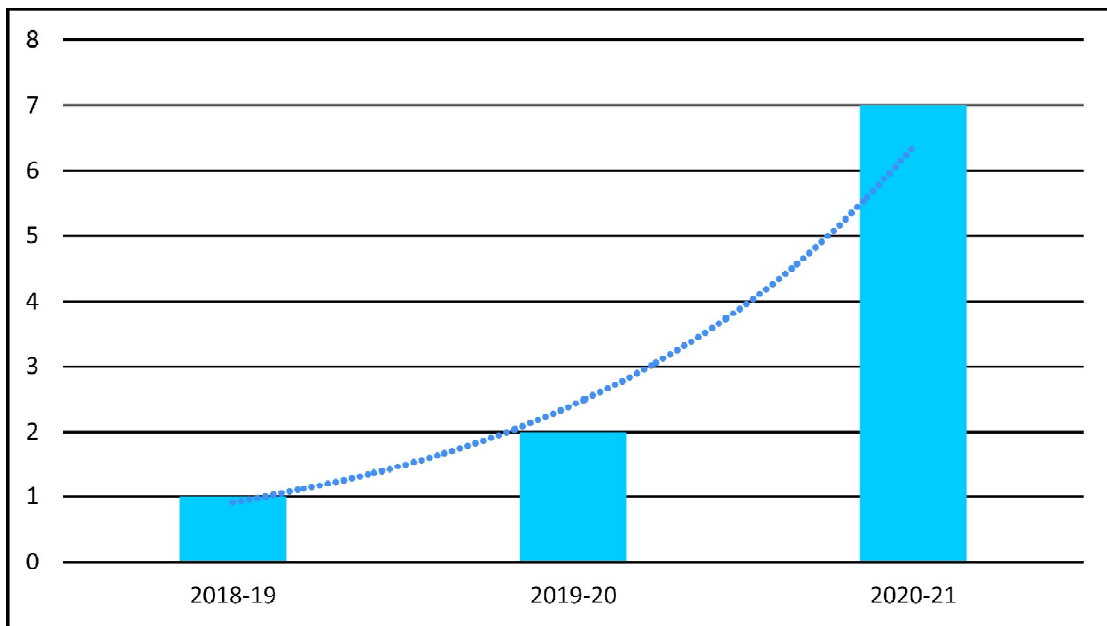


Figure 2: Number of ESG Funds Launched in India (Year-wise)

Source: Author's Own Compilation

Sector Leaders ETF) and one Fund of Funds (Mirae Asset ESG Sector Leaders FoF) have been launched (Sarkar, 2022). Figure 2 highlights the trend.

In terms of AUM, the sector recorded an astounding inflow of Rs. 3,686 crores in 2020-21 as compared to Rs. 2,094 crores in 2019-20, locking a growth of 76% approximately (Sarkar, 2022). The combined AUM of eight ESG-themed funds stood at Rs. 11,651 crores as of December 31, 2021 (value research). Thus, while from a global perspective the position of India is negligible, the pace at which new funds are launched in a short span of 3 years and the exponential rise in AUM highlights the increasing interest of Indian investors in the ESG funds space.

5.2. Performance Evaluation of ESG-themed Equity Funds

As of December 31, 2021, there were eight ESG-themed equity funds in India, the details of which are provided in table 1.

Table 1: Details of ESG Equity Funds (as on December 31, 2021)

<i>Fund Name</i>	<i>Launch Date</i>	<i>Expense Ratio (%)</i>	<i>Net Assets (Cr)</i>	<i>Top Three Holdings</i>	<i>Top Three Sectors</i>
Aditya Birla Sun Life ESG Fund	24.12.2020	1.87	1,061	Infosys, L&T Infotech, Bajaj Finance	Technology, Financial, Services
Axis ESG Equity Fund	12.02.2020	2.07	1,897	Bajaj Finance, Nestle India, Avenue Supermarts	Financial, Technology, Services
ICICI Prudential ESG Fund	09.10.2020	2.23	1,560	Infosys, Wipro, HDFC Bank	Technology, Financial, Consumer Staples
Invesco India ESG Equity Fund	18.03.2021	2.26	820	Infosys, Tata Consultancy Services, Kotak Mahindra Bank	Financial, Technology, Capital Goods
Kotak ESG Opportunities Fund	11.12.2020	2.04	1,619	Infosys, Tata Consultancy Services, Hindalco Inds.	Financial, Technology, Materials
Quant ESG Equity Fund	06.11.2020	2.71	53	The Indian Hotels Company, Adani Enterprises, Dr. Reddy's Lab	Services, Healthcare, Communication
Quantum India ESG Equity Fund	12.07.2019	1.68	58	Infosys, Tata Consultancy Services, Tata Consumer Products	Technology, Financial, Consumer Staples
SBI Magnum Equity ESG Fund (earlier SBI Magnum Equity Fund launched on 27.11.2006)	16.05.2018	2.07	4,583	Infosys, HDFC, ICICI Bank	Financial, Technology, Services

Source: Author's Own Compilation (based on data obtained from <https://valueresearchonline.com>)

Out of eight ESG equity funds, five were launched in 2020-21 itself. SBI Magnum Equity ESG fund has the largest AUM amounting to Rs. 4,583 crores followed by Axis ESG Equity Fund and Kotak ESG Opportunities Fund. All the funds invest 80% to 100% of their corpus in equity. Predictably, technology and financial services are the most preferred sectors. These sectors are traditionally considered to be ESG conscious and attain high ESG scores consistently. Infosys, Tata Consultancy Services, HDFC Bank, etc., are the most preferred constituents of their portfolio.

The performance has been evaluated for the earlier mentioned two periods based on : Annualised Return and Risk Measures, and Risk-adjusted Performance Measures.

Performance Based on Annualised Return and Risk of the Funds

In this section, annualised return (R_p), annualised risk (σ_p), downside deviation (D_p), and beta (β) of the funds are calculated on the basis of daily return data for 2021 as well as since inception. Annualised return of a fund is a better measure than the average return because it captures the effects of compounding. Here, portfolio risk means the total risk of the fund's portfolio and includes both systematic (β) as well as idiosyncratic risk. Systematic risk is a non-diversifiable risk caused by fluctuations in market conditions whereas idiosyncratic risk is a measure of volatility due to a fund's specific factors. A downside deviation is a statistical measure that aims to quantify the probability that an asset will lose its value (Van *et al.* 2001). It has been calculated using the semi-variance method. The results for 2021 are summarised in table 2.

**Table 2: Return and Risk Measures (Annualised)
(For the year 2021)**

<i>Fund Name</i>	<i>Annualised Portfolio Return (R_p)</i>	<i>Annualised Portfolio Risk (σ_p)</i>	<i>Downside Deviation (D_p)</i>	<i>Beta (β)</i>
Aditya Birla Sun Life ESG Fund	37.0775	15.5398	11.8406	0.91
Axis ESG Equity Fund	24.3304	12.4841	9.1291	0.6945
ICICI Prudential ESG Fund	22.0653	11.9309	8.4097	0.6716
Invesco India ESG Equity Fund	33.5671	10.7744	8.0534	0.7194
Kotak ESG Opportunities Fund	21.6553	13.3939	9.7773	0.7915
Quant ESG Equity Fund	62.8413	17.9854	13.4894	0.7986
Quantum India ESG Equity Fund	29.9623	13.4796	9.8371	0.7845
SBI Magnum Equity ESG Fund	29.8513	15.0278	10.8372	0.9251

Source: Author's Own Compilation

A perusal of table 2 reveals that all the sample funds earned healthy returns in 2021. The highest return was earned by Quant ESG Equity fund (62.8413%) followed by Aditya Birla Sun Life ESG Fund (37.0775%). This is quite interesting as Quant is the smallest fund with AUM of 53 crores as on

December 31, 2021 (table 1). However, it also has the highest portfolio risk (17.9854%) and downside deviation (13.4894%) which is an important factor that should be considered by risk-averse investors. Further, all the sample funds have a beta of less than 1 which is a positive signal. SBI Magnum Equity ESG Fund has the highest beta of 0.9251. The results since inception are summarised in table 3.

**Table 3: Return and Risk Measures (Annualised)
(Since Inception)**

<i>Fund Name</i>	<i>Annualised Portfolio Return (R_p)</i>	<i>Annualised Portfolio Risk (σ_p)</i>	<i>Downside Deviation (D_p)</i>	<i>Beta(β)</i>
Aditya Birla Sun Life ESG Fund	37.2336	15.4458	11.8389	0.9097
Axis ESG Equity Fund	30.8098	17.5513	14.3929	0.6309
ICICI Prudential ESG Fund	30.2553	11.6026	8.5463	0.6641
Invesco India ESG Equity Fund	33.5671	10.7744	8.0534	0.7194
Kotak ESG Opportunities Fund	22.0072	13.1634	9.7488	0.7534
Quant ESG Equity Fund	76.0489	17.5889	13.7503	0.7996
Quantum India ESG Equity Fund	24.4819	18.7862	16.8367	0.7696
SBI Magnum Equity ESG Fund	16.4164	19.7790	17.0304	0.9502

Source: Author's Own Compilation

Table 3 provides information about funds' returns and risk measures since their inception. Quant ESG Equity Fund has again outperformed other funds in terms of returns earned (76.0489%) on its portfolio. At the other end of the spectrum is SBI Magnum Equity ESG Fund which has provided the least returns (16.4164%) since its inception. Its risk profile is also not encouraging. It has the highest portfolio risk (19.7790%), downside deviation (17.0304%), and beta (0.9502). Out of eight funds, the SBI Magnum Equity ESG fund is the oldest fund with the highest AUM (table 1). The results cast a question mark on its state of affairs and call for a relook of its investment strategy.

It is sometimes argued (Bhuvra and Bantwa, 2020) that the higher returns earned by a fund could be due to the higher risk exposure of that fund. Thus, ex-post return measures which consider returns after adjustment of risk, or alpha which calculates fund returns relative to market return are considered a better barometer of performance.

Performance Based on Risk-adjusted Measures

This section assesses the performance of ESG equity funds on the basis of four risk-adjusted measures for 2021 and since inception. The measures are discussed as follows:

- **Sharpe Index:** Developed by W.F. Sharpe in 1966, this index provides information about the excess returns that an investor has earned for the volatility of holding a riskier portfolio comprising both systematic as well as idiosyncratic risk. It is also known as a reward to variability ratio and is expressed as follows:

$$\text{Sharpe Index} = \frac{R_p - R_f}{\sigma_p} \quad (7)$$

Where

R_p = Portfolio return

R_f = Risk-free return

σ_p = Total portfolio risk

While comparing funds, a typical investor would prefer a fund with a positive and higher Sharpe Index as it is an indication of superior returns for the same risk.

The index assumes the returns from a financial asset to be normally distributed. However, in declining markets, the returns do not mostly follow a normal distribution, and abnormalities like skewness or kurtosis exist which render standard deviation ineffective. To counter these problems, Treynor, Sortino, and Jensen have propounded their own risk-adjusted measures.

- **Treynor Ratio:** Developed by Jack Treynor in 1966, this ratio indicates the excess return generated by a portfolio per unit of systematic risk. It is also known as reward to volatility ratio and is expressed as follows:

$$\text{Treynor Ratio} = \frac{R_p - R_f}{\beta_p} \quad (8)$$

Where

R_p = Portfolio return

R_f = Risk-free return

β_p = Systematic risk of the portfolio

The ratio assumes that systematic risk, which reflects the sensitivity of a portfolio's return in response to changes in the market return, is a better barometer of a portfolio's performance. Idiosyncratic risk is unique to a portfolio and can be reduced by effective portfolio construction strategies, hence should not be considered. When comparing funds, a fund with a higher ratio is desirable since it means excess returns earned by it for the same systematic risk.

When the returns follow a normal distribution and the portfolio is well-diversified (so that element of idiosyncratic risk is negligible), Sharpe and Treynor measures yield similar results. Also, when a portfolio is not fully diversified, the Sharpe Index is a better indicator of performance and vice versa.

- **Sortino Measure:** Developed by Van der and Sortino in 2001, it measures excess returns earned by a portfolio per unit of downside risk. It seeks to penalise only those returns that fall below the mean rate of return (downside deviations), unlike Shape Index which penalises both upside and downside deviations equally. It is calculated as follows:

$$\text{Sortino Measure} = \frac{R_p - R_f}{D_p} \quad (9)$$

Where

R_p = Portfolio return

R_f = Risk-free return

D_p = Downside deviation of the portfolio

An investor is more concerned about the potential loss of his investment than the upside volatility, hence this measure. A higher ratio is an indication of better ex-post returns per unit of downside risk.

- **Jensen's Alpha:** Developed by Michael Jensen in 1968, Jensen's Alpha is a regression of excess fund returns with excess market return and is expressed as follows:

$$R_p - R_f = \alpha + \beta(R_m - R_f) + e_i \quad (10)$$

Where

R_p = Portfolio return

R_f = Risk-free return

R_m = Return on market portfolio

β = Systematic risk of the portfolio

e_i = Error term

The intercept of the equation is a measure of performance, called alpha ($\hat{\alpha}$). This measure is derived from the CAPM and involves running a regression with excess returns on security and that on the market acting as dependent and independent variables, respectively. A positive alpha is an indication that the fund manager has 'beaten the market' with their superior stock-selection skills, while a negative alpha indicates otherwise. This measure, therefore, is also considered a 'Selectivity Performance Measurement Model'. The risk-adjusted results for 2021 are provided in table 4.

A positive alpha in Table 4 indicates that all the sample funds have earned returns higher than the market for 2021. Moreover, it was found that Quant ESG Equity Fund has outperformed all the other sample funds in 2021. It has the highest Sharpe Index (3.3008), Treynor Ratio (74.3372), Sortino Measure (4.4009), and Jensen's Alpha (43.1395). Launched in November 2020, this fund has the least AUM as of December 31, 2021 (53 crores) out of all the sample funds. The fund allocates 100% of its corpus in equity and its portfolio consists of 28 stocks. Services, healthcare, and communications are its preferred sectors (value research). At the same time, it has the highest portfolio risk (17.9854%) and downside deviation (13.4894%). A high downside deviation is a matter of concern for risk-averse investors as it signifies a higher probability of an investment losing its value in case of market fluctuations. Quant ESG Equity Fund is followed by Invesco India ESG Equity Fund and Aditya Birla Sun Life ESG Fund. Kotak ESG opportunities fund turned out to be the worst performer for 2021 having the lowest Sharpe Index (1.3573), Treynor Ratio (22.9687), Sortino Measure (1.8594), and Jensen's alpha (2.0978). Launched in December 2020 having an AUM of 1,619 crores, this fund invests majorly in the Financial and Technology sectors with Infosys, TCS, and Hindalco Industries as preferred companies. Its portfolio consists of 44 stocks (value research). Table 5 provides the ranking of risk-adjusted performance results to get a summarised picture.

Table 4: Risk-adjusted Measures (For the year 2021)

Fund Name	Annualised Portfolio Return (R_p)	Risk-free Rate (R_f)	Annualised Portfolio Risk (σ_p)	Beta (β)	Annualised Downside Deviation (D_p)	Market Return (R_m)	Sharpe Index	Treynor Ratio	Sortino Measure	Jensen's Alpha (α)
Aditya Birla Sun Life ESG Fund	37.0775	3.4756	15.5398	0.91	11.8406	23.7939	2.1623	36.9252	2.8378	15.1122
Axis ESG Equity Fund	24.3304	3.4756	12.4841	0.6945	9.1291	23.7939	1.6705	30.0285	2.2844	6.7437
ICICI Prudential ESG Fund	22.0653	3.4756	11.9309	0.6716	8.4097	23.7939	1.5581	27.6797	2.2105	4.9439
Invesco India ESG Equity Fund	33.5671	3.4756	10.7744	0.7194	8.0534	23.7939	2.7929	41.8286	3.7365	15.4745
Kotak ESG Opportunities Fund	21.6553	3.4756	13.3939	0.7915	9.7773	23.7939	1.3573	22.9687	1.8594	2.0978
Quant ESG Equity Fund	62.8413	3.4756	17.9854	0.7986	13.4894	23.7939	3.3008	74.3372	4.4009	43.1395
Quantum India ESG Equity Fund	29.9623	3.4756	13.4796	0.7845	9.8371	23.7939	1.9649	33.7625	2.6925	10.5467
SBI Magnum Equity ESG Fund	29.8513	3.4756	15.0278	0.9251	10.8372	23.7939	1.7551	28.5112	2.4338	7.5792

Source: Author's Own Compilation

**Table 5: Summarised Ranking
(For the Year 2021)**

<i>Fund Name</i>	<i>Sharpe Index</i>	<i>Treynor Ratio</i>	<i>Sortino Measure</i>	<i>Jensen's Alpha (α)</i>
Aditya Birla Sun Life ESG Fund	3	3	3	3
Axis ESG Equity Fund	6	5	6	6
ICICI Prudential ESG Fund	7	7	7	7
Invesco India ESG Equity Fund	2	2	2	2
Kotak ESG Opportunities Fund	8	8	8	8
Quant ESG Equity Fund	1	1	1	1
Quantum India ESG Equity Fund	4	4	4	4
SBI Magnum Equity ESG Fund	5	6	5	5

Source: Author's Own Compilation

As is evident from Table 5, all the risk-adjusted measures of performance evaluation are univocal in their verdict for 2021. Quant ESG Equity Fund has outperformed all the sample funds. It is followed by Invesco India ESG Equity Fund and Aditya Birla Sun Life ESG Fund in that order. Kotak ESG opportunities fund is the laggard and has been ranked at the bottom. It calls for a reassessment of its investment style. It is to be noted that when the return distributions are symmetrical or when funds' portfolios are well-diversified, the risk-adjusted performance measures tend to yield similar results (stock market concepts).

The risk-adjusted performance since the inception of each fund is given in Table 6.

Table 6 shows risk-adjusted measures of the sample funds since their inception. All the funds have earned returns higher than market returns as exhibited by positive alpha. Also, Quant ESG Equity Fund again emerged as the best performer with the highest Sharpe Index (4.1285), Treynor Ratio (90.8160), Sortino Measure (5.2811), and Jensen's Alpha (47.1744). It has been able to earn excess returns per unit of total risk, systematic risk, downside deviation as well as the benchmark index. At the other end of the spectrum is SBI Magnum Equity ESG Fund with the lowest Sharpe Index (0.4981), Treynor Ratio (10.3674), Sortino Measure (0.5784), and Jensen's Alpha (2.6379). Out of the sample funds, it has minimum annual returns (16.4164) with the highest portfolio risk (19.7790) and downside deviation (17.0304).

To have a better understanding of the risk-adjusted performance of each fund since inception, rank analysis has been performed and the results are presented in table 7.

Table 7 reiterates that Quant ESG Equity Fund has outperformed other funds based on all four risk-adjusted performance measures. Invesco India ESG Equity Fund has been accorded the second rank by all measures except Treynor Ratio. SBI Magnum Equity ESG Fund has been ranked at the bottom by all risk-adjusted measures except Jensen's Alpha. The position of other funds has been variable across the measures.

Table 6: Risk-adjusted Measures (Since Inception)

Fund Name	Annualised Portfolio Return (R_p)	Risk-free Rate (R_f)	Annualised Portfolio Risk (σ_p)	Beta (β)	Annualised Downside Deviation (D_p)	Market Return (R_m)	Sharpe Index	Treynor Ratio	Sortino Measure	Jensen's Alpha (α)
Aditya Birla Sun Life ESG Fund	37.2336	3.4692	15.4458	0.9097	11.8389	24.2294	2.1860	37.1160	2.8520	14.8788
Axis ESG Equity Fund	30.8098	3.5495	17.5513	0.6309	14.3929	21.7929	1.5532	43.2086	1.8940	15.7505
ICICI Prudential ESG Fund	30.2553	3.4234	11.6026	0.6641	8.5463	35.7222	2.3126	40.4034	3.1396	5.3823
Invesco India ESG Equity Fund	33.5671	3.4756	10.7744	0.7194	8.0534	17.7632	2.7929	41.8286	3.7365	19.8130
Kotak ESG Opportunities Fund	22.0072	3.4647	13.1634	0.7534	9.7488	25.0899	1.4086	24.6118	1.9020	2.2501
Quant ESG Equity Fund	76.0489	3.4324	17.5889	0.7996	13.7503	35.2509	4.1285	90.8160	5.2811	47.1744
Quantum India ESG Equity Fund	24.4819	3.9736	18.7862	0.7696	16.8367	17.9123	1.0917	26.6480	1.2181	9.7811
SBI Magnum Equity ESG Fund	16.4164	6.5653	19.7790	0.9502	17.0304	14.1565	0.4981	10.3674	0.5784	2.6379

Source: Author's Own Calculations

**Table 7: Summarised Ranking
(Since Inception)**

<i>Fund Name</i>	<i>Sharpe Index</i>	<i>Treynor Ratio</i>	<i>Sortino Measure</i>	<i>Jensen's Alpha (α)</i>
Aditya Birla Sun Life ESG Fund	4	5	4	4
Axis ESG Equity Fund	5	2	6	3
ICICI Prudential ESG Fund	3	4	3	6
Invesco India ESG Equity Fund	2	3	2	2
Kotak ESG Opportunities Fund	6	7	5	8
Quant ESG Equity Fund	1	1	1	1
Quantum India ESG Equity Fund	7	6	7	5
SBI Magnum Equity ESG Fund	8	8	8	7

Source: Author's Own Compilation

6. Conclusion

Numerous global challenges have necessitated the need for the adoption of ESG parameters in business and investment decisions. It is widely accepted that only those businesses that comply with these parameters will be able to deliver sustainable performance in the long run. This has led to an 'ESG movement' across the world and created a new breed of investors who see ESG investing as one of the ways to promote sustainable development. In this scenario, ESG mutual funds have emerged as a preferred route of investment and have witnessed a massive inflow of funds in recent years.

The main goal of this study was to analyse the growth of ESG mutual funds in India and also to evaluate their performance so far. With respect to growth, it was found that the ESG mutual fund industry is still in its infancy in India though a steady and positive momentum is seen since 2018, both in terms of the number as well as the AUM of these funds.

The performance analysis of ESG equity funds concentrated on the comparative performance of these funds among themselves and against the market index (Nifty 50) using standalone return and risk measures as well as widely recognised risk-adjusted measures. The results were ranked to summarise the analysis.

The study found Quant ESG Equity Fund to be the best performer both for 2021 as well as since its inception. This is even though the fund was launched in 2020 only and has the least AUM as on December 31, 2021 among others. A deeper analysis reveals that the fund is a high return-high risk fund with 100% investment in equity (ET Money). This calls for caution on the part of risk-averse investors. Kotak ESG Opportunities Fund and SBI Magnum Equity ESG Fund turned out to be the worst performers for 2021 and since inception, respectively. SBI Magnum Equity ESG Fund is the oldest fund with the highest AUM and the results call for a complete overhaul of its investment strategy. Further, interestingly all the sample funds were found to have positive Jensen's Alpha which indicates that all of them have 'beaten the market' and earned superior returns. It is an indication of superior stock selectivity skills of fund managers.

The study has strong implications for investors, industry and regulators. For investors, the findings substantiate that ESG investing not only leads to the accomplishment of their sustainability goals but also affords them returns higher than the traditional route to investing. This would encourage them to pursue ESG based investing as a long-term investment strategy. It has implications for the ESG fund industry to rise to the occasion and adopt innovative and comprehensive data analysis tools and technologies such as artificial learning, robotics etc to formulate investment methodologies tailor made to the needs of investors. The study can be a basis for regulators for policy formulation specifically with respect to ESG mutual fund industry.

A separate study that compares the ESG funds with traditional funds can be undertaken. In India ESG mutual funds started their journey from 2018. For this reason, the study covers a period of approximately 3.5 years. In future, studies to compare ESG funds with traditional funds with larger time horizon may be undertaken in Indian context. This can be a very interesting research area.

References

- Bauer, R., Koedijk, K., & Otten, R. (2005). International evidence on ethical mutual fund performance and investment style. *Journal of Banking & Finance*, 29(7), 1751-1767.
- Bhuva, K. K., & Bantwa, A. (2020). Risk, return & performance evaluation of selected mutual fund schemes—a study on large & mid cap funds. *Journal of Management and Science ISSN*, 2250-1819.
- Boffo, R., & Patalano, R. (2020). ESG investing: Practices, progress and challenges. *Éditions, OCDE, Paris*.
- ET Money. (n.d.). ET Money. <https://www.etmoney.com/mutual-funds/quantessg-equity-fund-direct-growth/41633>
- Fama, E., (1972). Components of Investment Performance. *Journal of Finance*, 27(3), 551-567.
- Friend, I., Brown, F., Herman, E. and Vickers, D. (1962) A Study of Mutual Funds, US Securities and Exchange Commission, US Government Printing Office, Washington DC.
- Govindarajan, V. L., & Amilan, S. (2013). An influence of CSR initiatives with financial performance: Evidence from petro–gas products industry in India. *Academia: An International Multidisciplinary Research Journal*, 3(8), 1-27.
- Jensen, M. C. (1968). The performance of mutual funds in the period 1945-1964. *The Journal of Finance*, 23(2), 389-416.
- Kerber, R., & Jessop, S. (2021). Analysis: How 2021 became the year of ESG investing.
- Kreander, N., Gray, R. H., Power, D. M., & Sinclair, C. D. (2005). Evaluating the performance of ethical and non ethical funds: a matched pair analysis. *Journal of Business Finance & Accounting*, 32(7 8), 1465-1493.
- Laskar, N., & Maji, S. G. (2017). Corporate sustainability performance and firm performance: evidence from India and South Korea. *International Journal of Corporate Strategy and Social Responsibility*, 1(2), 118-140.
- Murugaboopathy, P., & Dogra, G. (2021). India has fewer ESG funds than other top economies.
- Naffa, H., & Fain, M. (2020). Performance measurement of ESG-themed megatrend investments in global equity markets using pure factor portfolios methodology. *PLoS one*, 15(12).
- Neroy, R. (2021). Will ESG funds become more popular as we Navigate the waves of the COVID-19 Pandemic?
- Renneboog, L., Ter Horst, J., & Zhang, C. (2011). Is ethical money financially smart? Nonfinancial attributes and money flows of socially responsible investment funds. *Journal of Financial Intermediation*, 20(4), 562-588.

- Sarkar, S. (2022). Performance evaluation of ESG funds in India: A study. *The Management Accountant Journal*.(0972-3528) 57. 40-47.
- Sharpe, W. F. (1966). Mutual fund performance. *The Journal of Business*, 39(1), 119-138.
- Sinha, R. (2021). Despite challenges, ESG investing is gaining momentum in India.
- Stock Market Concepts. (n.d.). Stock Market Concepts. <http://stockmarketconcepts.weebly.com/difference-between-sharpe-ratio-treynor-ratio-and-information-ratio.html>
- Treynor, J., & Mazuy, K. (1966). Can mutual funds outguess the market? *Harvard business review*, 44(4), 131-136.
- Valueresearchonline. (n.d.). Valueresearch. <https://www.valueresearchonline.com>
- Van der Meer, R., Sortino, F., & Plantinga, A. (2001). The impact of downside risk on risk-adjusted performance of mutual funds in the Euronext markets.
- Yue, X. G., Han, Y., Teresiene, D., Merkyte, J., & Liu, W. (2020). Sustainable funds' performance evaluation. *Sustainability*, 12(19), 8034.