ESG Score and Mutual Fund Performance : Empirical Evidence from India

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Abstract

This paper studied the relationship between risk-adjusted returns and ESG disclosures of mutual funds operating in India for 13 years. It tested whether the mutual funds with higher ESG scores generated higher risk-adjusted returns than those with lower ESG scores. Further, it also tested whether the mutual funds with higher ESG scores performed better during the COVID-19 crisis period. After controlling for Fama-French five factors, we found that the performance of mutual funds with higher ESG scores neither generated significant positive alphas during the normal period nor the COVID-19 period. The results pointed toward the higher cost of being socially responsible through higher screening costs, opportunity costs, etc. These findings will interest investors, policymakers, and other stakeholders regarding the perceived advantage of investing in socially responsible mutual funds.

Keywords : **ESG, India, mutual funds performance**

JEL Classification Codes : G11, G12, G14

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The demand for socially responsible investments has increased over the years, especially in developed countries (Nofsinger & Varma, 2014). This is because investors are becoming more aware of the environmental, social, and governance factors while deciding where to invest (Lean et al., 2015). In line with the trend, socially responsible mutual funds (SRMF) have seen a significant spurt in volumes and numbers over the past two decades. According to a report by US SIF Foundation, the estimated assets under management for socially responsible investments (SRI) were close to $7.6 trillion in 2022 (US SIF, 2022). Further, approximately 18% of the total SRI investments come from SRMF in the US.

The Indian financial markets are also fast catching up with respect to ESG investments. Since 2011 three indices (NIFTY100 ESG Index, NIFTY100 Enhanced ESG Index, and Nifty100 ESG Sector Leaders Index) have been launched by the National Stock Exchange of India comprising companies within the NIFTY 100 index based on Environmental, Social, and Governance (ESG) scores. Further, S&P BSE 100 ESG Index and S&P BSE CARBONEX were launched on the Bombay Stock Exchange in 2016. More recently, nine SRMF mutual funds have been launched in the last two years. These funds have attracted $0.52 billion in 2020–21, a jump of 76% from the preceding fiscal year ("Inflows in sustainable funds," 2021). This trend is expected to continue as investors, corporations, and fund managers are more aware of the importance of socially responsible investments (Tripathi & Bhandari, 2015).

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Several authors have provided evidence that socially responsible investments positively affect returns (Albuquerque et al., 2020; Clark et al., 2015; Derwall et al., 2005; Durán-Santomil et al., 2019; Statman & Glushkov, 2009). A similar viewpoint has been highlighted in recent McKinsey's 2020 Global Survey on ESG programs, which reported that the majority of fund managers and investment professionals agreed that ESG investments enhance shareholder value (Delevingne et al., 2020). In contrast, another strand of literature reports a negative association between SRMF and financial returns due to higher operational costs. They reveal that returns for companies with a high ESG score are lower than market returns (Brammer et al., 2006; Gregory et al., 1997; Galema et al., 2008; Renneboog et al., 2008; Trinks & Scholtens, 2017). Additionally, the negative impact can be exacerbated by screening intensity.

However, Rathner (2013), in a meta-analysis study, found no statistical difference in performance between SRMF domiciled in the US and conventional mutual funds. Similar results were reported by (Bauer et al., 2005; Bauer et al., 2007; Białkowski & Starks, 2016; Cortez et al., 2009; Chang & Doug Witte, 2010; Derwall & Koedijk, 2009; Gil-Bazo et al., 2010; Hartzmark & Sussman, 2019; Naffa & Fain, 2022). Studies attribute similar performance for the two categories as both categories of these mutual funds are usually managed similarly to traditional mutual funds leading to no significant difference in performance (Benson et al., 2006).

A few studies have also compared the performance of SRMF during non-crisis and crisis periods and examined if SRMF outperformed conventional mutual funds during the market crisis and underperformed during non-crisis periods (Das, 2020; Hassan & Fazili, 2019; Leite & Cortez, 2015; Muñoz et al., 2014; Mondal & Johari, 2021; Nofsinger & Varma, 2014; Soni & Singh, 2020). The results have also been mixed for these studies. Amid mixed results on SRMF performance in the US and European countries, this study aims to extend the research to an emerging country, India. ESG investments—an idea conceptualized in developed economies—are still in the nascent stages of development in India due to a lower level of awareness, lack of ESG data, etc. Thus, empirical validation is crucial to make investors realize its significance. Given the limited empirical evidence on ESG investments, especially in the Indian mutual fund industry, this paper is a significant contribution to the Indian context.

We try to examine whether SRMF has a higher cost of doing business. Does this cost pay off in terms of risk-adjusted performance? Does the performance differ during a period of turmoil like the recent pandemic?

Our results are summarized as follows. First, we observe that mutual funds with higher sustainability ratings have lower financial performance than those with higher sustainability ratings. For India, the cost of being sustainably responsible weighs its financial performance. Second, we also document that SRMF funds in India could not outperform the market, which contradicts the findings of Nofsinger and Varma (2014) and Pástor and Vorsatz (2020) that SRMF funds provide an insurance role in a time of crisis.

Literature Review

The research on whether SRMF performs better than conventional mutual funds has found mixed results. For example, studies by Hamilton et al. (1993), Boulatoff and Boyer (2009), Gil-Bazo et al. (2010), Cortez et al. (2009), Chang and Doug Witte (2010) found no difference in risk-adjusted performance between SRMF and conventional mutual funds.

Researchers have also got mixed results while examining the performance of SRMF funds during the economic crisis. Nofsinger and Varma (2014), Muñoz et al. (2014), and Leite and Cortez (2015) found that both US SRMF and European SRMF underperformed relative to the market during normal (non-crisis) periods. However, the results were mixed for the relative performance of SRMF during the economic crisis. Muñoz et al. (2014) and Leite and Cortez (2015) found statistically insignificant performance during the economic crisis, concluding that the cost of being socially responsible did not translate into better risk-adjusted performance for

both the US and the European markets. However, Nofsinger and Varma (2014) and Becchetti et al. (2015) found that SRMF outperformed conventional mutual funds during periods of market crisis, like the 2007 global financial crisis.

In their meta-analysis, Clark et al. (2015) found that high ESG led to better performance and less associated risk. Durán-Santomil et al. (2019) and Albuquerque et al. (2020) found that a higher sustainability rating led to better performance, lower volatility, and higher fund flow. In contrast, Hartzmark and Sussman (2019) found no evidence of the outperformance of high-sustainability funds. The results are also mixed for the Asian market. Han et al. (2016) found no evidence of a relationship between the social responsibility performance score and financial performance in the Korean market.

In contrast, Broadstock et al. (2021) found that high-ESG portfolios generally outperformed low-ESG portfolios in the Chinese market. Trinks and Scholtens (2017) found that negative screening negatively impacts risk-adjusted return. Pástor and Vorsatz (2020) concluded that high sustainability ratings among mutual funds were preferred for investors who valued sustainability. Dolvin et al. (2017) found that small-cap funds had lower portfolio sustainability scores, leading to large-cap bias among SRMFs. Similarly, Naffa and Fain (2022) highlighted evidence of the neutrality argument and reported no sufficient evidence for ESG factors to complement Fama-French factors. Murashima (2023) studied the changes in investment behavior due to COVID-19 for investors in Japan, the USA, and Germany. The results documented some changes in investor behavior with respect to SRI after COVID-19. They also concluded that return-related factors inversely influenced SRI, whereas social issues positively impacted SRI.

In the Indian context, several studies, including Gupta and Chander (2011), Kumar and Arora (2013), Rehmani (2018), and Mishra and Ahuja (2016), have studied different characteristics of Indian mutual funds; however, studies examining ESG parameters have been limited. Tripathi and Bhandari (2015) examined the returns of green and non-green stocks portfolio and found that green, blue chip stocks portfolio could generate positive alphas during the crisis period. Further, Bhanu Murthy et al. (2014) also examined if socially responsible companies generate higher returns than general companies and found that the returns of socially responsible companies caused positive alphas both during and after the crisis period. Overall, in summary, we can observe that limited research has been done in the Indian context, especially in terms of socially responsible mutual funds. Further, our research focuses on recent data from the past 13 years after considering the Fama-French five factors. Therefore, based on the discussion above, the next section focuses on the formulated hypothesis.

Research Methodology

This section describes the data, the variables used in the analysis, the methodology, and the formulated hypothesis.

Data

We used the Refinitiv Portfolio ESG Score for the creation of two portfolios. Portfolio 1 had a High ESG Score (Bottom 20%), and Portfolio 2 had a Low ESG Score (Top 20%). The score ranged between 0–100 and was calculated using a weighted average of firm-level ESG Risk Scores. Higher ESG indicated that a fund had higher allocations in companies with high ESG Risk. Our sample consisted of surviving SRMF with an ESG rating, a minimum fund size of $1 billion, and an inception date of less than equal to March 2010. We aimed to study funds with a performance history of at least 13 years. Our study period consisted of 13 years (3/1/ 2010 to 3/1 /2022) and used monthly return data.

Table 1. ***Assets of India SRMF (357 Funds) Selected for the Study***

Equity Mutual Fund Category	AUM (USD million)	% of Total AUM	No. of Funds	Avg. ESG
Large-Cap	78934.59	24.24%	42	28.53
Mid-Cap	45835.57	13.94%	47	32.22
Healthcare	3606.42	1.03%	7	36.32
Financial Services	3151.57	0.95%	7	32.20
Technology	1428.42	0.41%	6	18.79

Data Overview

Table 1 presents the preliminary overview of Indian mutual funds. For Indian mutual funds, there are nine categories of mutual funds, with a total of 470 funds. The largest category is India Equity. India Fixed Income category was removed from our study to give base comparability for equity funds. Further, the target date category was also not considered as Target Date funds, by their very definition, changed their allocation strategy. This gave us a sample size of 452 funds. Further, 79% of the SRMF funds and 77% of AUM in the sample belonged to the India Equity category. The other four categories were minimal in size. Moreover, the India Equity category was further divided into five sub-categories, and thus, we focused our study on the India Equity category as a representation of India SRMF.

Description of Variables

The following fund-level variables were collected from the Refinitiv database. The risk-adjusted return was taken as the dependent variable for the regression equation. The independent variables included in this analysis comprised the Fama-French 5-factor model (MRP, SMB, HML, RMW, CMA), where MRP is the additional return of the market over the risk-free rate and is based on the capital asset pricing model (CAPM) (Sharpe, 1964), SMB is the difference in the mean returns of the nine small-cap portfolios and nine large-cap portfolios, HML is the difference in the mean returns of the two value portfolios and the two growth portfolios, RMW is the difference in the mean return between the two robust operating profitability portfolios and two weak operating profitability portfolios, and CMA is the difference in the mean return of two aggressive investment portfolios and two conservative investment portfolios (Chopra & Saldi, 2022).

Methodology

In the first step, based on the historical portfolio ESG score for March 2022 for our selected sample, we constructed two equally weighted portfolios—one comprising the top 20% and the second comprising the bottom 20% of SRMF. Next, we tested the normality of the variables using the Shapiro-Francia *W* Test. We test the normality of the variables using the Shapiro-Francia *W* Test. Further, by employing the Mann-Whitney *U* test , we examine if beta, fund size, and return of top 20% and bottom 20% portfolios are statistically different. Similar to previous research, we use the Fama-French five-factor model to check the hypothesized relationship between sustainability scores (Kavita & Suman, 2019; Kaur & Pasricha, 2019; Ledwani et al., 2022). Our model captures the risk-adjusted performance of the top 20 % and bottom 20 % mutual fund portfolio after considering the Fama-French five - factors (Equation 1).

After considering the Fama-French five factors, our model captured the risk-adjusted performance of the top 20% and bottom 20% in the two countries (Equation 1). The five factors for India were downloaded from the data

library created by IIM-Ahemdabad (Indian Institute of Management, Ahmedabad, n.d.). Finally, model 1 employed pooled OLS regression to examine the dynamic relationship as denoted in equation 1.

$$[Risk\,Adj.\,Ret_t] = \alpha_i + \beta_1 MRP_{ti} + \beta_2 SMB_{ti} + \beta_3 HML_{ti} + \beta_4 RMW_{ti} + \beta_5 CMA_{ti} + e_t \quad (1)$$

Regression analysis was carried out for India's top 20% and the bottom 20% portfolios for 13 years (145 monthly returns). We split our data into two sub-periods from March 2010 – December 2019 (118 monthly returns) and from January 2020 – March 2022 (27 monthly returns) to study the performance of SRMF during the pre-COVID and COVID periods.

Hypothesis

Mutual funds with an ESG mandate might have a higher cost of operations as such funds would choose stocks with better ESG scores. The higher cost of adhering to the environment, governance, and sustainability that these stocks must maintain may reduce the financial performance of the funds (Das, Chatterjee, Sunder, & Ruf, 2018; Das, Ruf, Chatterjee, & Sunder, 2018). On the other hand, it is also possible that stocks with higher ESG scores have better risk management, leading to higher risk-adjusted returns in the long run. Based on the above two theoretical foundations, we hypothesized that funds with better ESG performance outperform the lower ESG funds domiciled in India. Further, we also expected ESG funds to be able to wither the global crisis better compared to the overall market performance. Therefore, we studied the relationship between risk-adjusted returns while controlling for the Fama-French factors for SRMF domiciled in India. We further examined the performance of SRMF during times of global economic crisis like COVID-19. Therefore, we formulated the following hypotheses for our study:

- **H_1 :** It is expected that top SRMF funds do not outperform the bottom SRMF funds after controlling for Fama-French factors.
- **H_2 :** It is expected that top SRMF funds do not outperform the bottom SRMF funds after controlling for Fama-French factors during the COVID-19 crisis period.

The research added to the existing literature by empirically testing SRMF performance in India. We tried to examine if SRMF had a higher cost of doing business and whether this cost paid off in terms of risk-adjusted performance in a developing economy. We also tested whether the recent pandemic had a differential impact on the performance of SRMF domiciled in India.

Analysis and Results

Mann-Whitney U Test

In order to answer research question 1, we examine the relative distribution of portfolio return, beta, and fund size for the top 20% and bottom 20% portfolios in India by applying the non-parametric test—the Mann-Whitney test. This procedure helps us to test that the distribution for both tested groups is identical. The results are considered statistically significant if the *p*-value is smaller than 0.01. The Mann-Whitney *U* test was used instead of the conventional mean difference *t*-test as the variables were not normally distributed. The test examines if the three variables (mutual fund return, beta, and fund size) differ for the top 20% and bottom 20% portfolios. Table 2 presents the results of the Mann-Whitney *U* test.

Table 2. ***Results of Mann-Whitney U Test***

Variables	Portfolio	*N*	India		
			Mean Rank	Sum of Ranks	Mann-Whitney *U*(Sig.)
Return	Top 20% ESG Port.	145	133.81	17786	0.85
	Bottom 20% ESG Port.	145	133.19	17705	
Fund Size	Top 20% ESG Port.	145	166.11	21074	0.00
	Bottom 20% ESG Port.	145	100.89	12407	
Beta	Top 20% ESG Port.	145	122.11	16232	0.03
	Bottom 20% ESG Port.	145	144.89	15261	

Note.*Significant at 1% level of significance (2-tailed).

Table 3. ***Performance of Top 20% of US SRMF and India SRMF Using Fama-French 5-Factor Model***

	Top 20 % Mutual Funds			Bottom 20 % Mutual Funds		
Variables	**2010–2022**	**2010–2020**	**2020–2022**	**2010–2022**	**2010–2020**	**2020–2022**
MRP	1.289***	1.360***	1.129***	1.398***	1.501***	1.182***
SMB	0.0310	0.192	0.0213	0.239*	0.458**	0.520
HML	0.165	0.320	–0.278	0.500**	0.483***	0.312
RMW	0.0230	–0.0604	0.406	0.237	0.274	–0.128
CMA	–0.288**	–0.518*	0.0824	–0.498**	–0.319*	–0.239
Alpha	–0.189*	–0.154*	0.74	0.351	0.429	0.290
N	145	118	27	145	118	27
R^2	0.915	0.890	0.889	0.834	0.846	0.846

Note. *$p < 0.05$; ** $p < 0.01$; *** $p < 0.001$.

The *p*-value for beta and fund size is less than 0.01, indicating that the difference in the two variables is statistically significant for the two categories. There is no statistical difference in return between the top 20% and the bottom 20% portfolios. The results provide preliminary evidence that although fund size and beta differ across the two categories, our primary variable of interest, i.e., mutual fund returns, do not differ across the top and bottom portfolios. To confirm the findings of the Mann-Whitney *U* test, we proceed to the next step, where we test for differences in the mean return of the two portfolios after controlling for the Fama-French five factors.

Regression Analysis Using the Fama - French Model

Table 3 presents the results of the regression analysis. We use the Fama-French 5-factor model for testing our formulated hypothesis. It can be observed that the alpha coefficients are negative for the top 20%; however, on the contrary, the alpha coefficients are positive and statistically significant for the bottom 20% portfolio. The results lead us to accept our first hypothesis and conclude that SRMF funds do not outperform the bottom 20% of mutual funds. Further, the alpha values during COVID-19 period are positive but not statistically significant, thereby leading to accepting our second hypothesis.

In the case of market risk premium (MRP), the coefficients are significant and positively associated with the two portfolios. Further, the MRP coefficients are higher for the bottom 20% portfolio, indicating that MRP has a

greater impact on risk-adjusted returns for the bottom 20% of the funds. Furthermore, except for CMA, the other three factors (SMB, HML, and RMW) were not statistically significant for the top 20% portfolio. In the case of CMA, the factor has a significant negative impact on risk-adjusted returns. Negative CMA factor loadings imply that the top 20% of mutual funds may be investing in aggressive shares, as defined in the CMA factor.

The results for the bottom 20% of portfolios are also shown in Table 3 for our sample mutual funds. Except for RMW, all other factors are statistically significant. SMB is statistically significant for the bottom 20% of the portfolio, leading us to conclude that they invest in small stocks compared to the top 20% of portfolios. Further, HML is statistically significant and positive for the bottom performers in India. Therefore, we can conclude that the bottom 20% of mutual funds also practice momentum investing.

Conclusion

The study examines the performance of the top and bottom 20% SRMF classified based on sustainability rating scores for the last 13 years for India. In addition, we examine if there is a difference in the performance of the socially responsible mutual funds (SRMF) during regular times and the global pandemic (COVID-19). The results of the Mann-Whitney *U* test provide preliminary evidence that although fund size and beta differ across the two groups (top 20% and bottom 20%), the SRMF financial performance does not differ across the two portfolios. We find negative alphas for India SRMF, which leads us to believe that the cost of being socially responsible distorts the financial performance of developing economies. Further, we do not get positive alphas for the crisis period. Further, the alphas are not statistically significant, and the relationship is negative. As a result, Indian SRMF is not able to outperform the market. Thus, our findings contradict Nofsinger and Varma (2014) and Pástor and Vorsatz (2020), who concluded that SRMF funds in developed markets provided insurance during the crisis.

In the case of the SMB factor, the coefficient is positive and statistically significant for the bottom 20% portfolio but not statistically significant for the top 20% portfolio. Thus, the bottom 20% portfolio appears to invest in growth and small stocks compared to the top 20%. The results are similar to Steen et al. (2020), who also reported a positive association with the SMB factor for the bottom SRMF portfolio. For the HML factor, we get positive and statistically significant results for the bottom 20% portfolio. The bottom 20% invest in value stocks, as evidenced by a positive significant coefficient.

The RMW factor is not statistically significant for India for both portfolios. The results are in line with Omura et al. (2021), who do not find the RMW factor significant for most jurisdictions except for European mutual funds. Further, the sign of the CMA factor is negative for the top 20% portfolios, indicating that the top 20% of funds may not be investing in conservative funds as defined in the CMA factor. We can broadly conclude that India SRMF practices momentum investing. The persistence of the disposition effect can explain this.

Pre-COVID results (2010–2020) indicate that the Indian RMF does not outperform the market. This is because the cost of being sustainably responsible weighs on financial performance. However, we cannot emphatically conclude that the negative alpha is not statistically significant. The results of the 2020–22 COVID-19 show that SRMF funds could not outperform the market.

Managerial and Theoretical Implications

The developed and emerging markets are under tremendous pressure to perform well and integrate and align their business strategies toward ESG. Adopting the ESG framework is among the important steps toward achieving the country's sustainable development goals. Further, fund managers and investors interested in investing in stocks with higher ESG standards have also increased over the years worldwide and are expected to increase further. Since SRMF invests in companies with higher disclosures toward ESG issues, including climate change, human

rights, gender equality, diversity, etc., it is expected that these companies are likely to achieve both financial and ESG goals. They will also generate resilient and stable financial performance in the long run. Although the notion is well accepted in developed countries, the empirical results fail to find support in the Indian context.

Since companies that adhere to ESG protocols have a higher cost of doing business, especially in emerging economies, because of the less strict standards of environment, governance, and sustainability, this cost presumably reduces the companies' financial performance, translating into lower performance of ESG funds. Further, sectors like tobacco, cigarettes, mining, cement, etc., which may be highly profitable, get excluded due to lower ESG performance leading to lower portfolio returns.

The results call for attention from policymakers where investors investing in ESG funds may be compensated for lower returns through differential taxation on ESG funds. Lower taxability on ESG funds could translate into higher real returns, thereby boosting demand for ESG funds in India. Further, the results also point out that ESG funds in India may be unable to find growth stocks, especially from lower or mid-cap segments, due to insufficient ESG disclosures or lack of data. Therefore, awareness among lower and mid-cap segment companies to improve ESG disclosures is also required. Furthermore, the results also call for increasing the understanding of ESG funds for investors and financial advisors, especially when the volume and size are smaller than in other developed countries.

Limitations of the Study and Scope for Future Research

While this paper analyzes the performance of equity mutual funds in India before and during the COVID-19 crisis, it leaves much scope for future research. For example, other factors like the investment strategy of mutual funds, age of mutual funds, the experience of managers, expense ratio, mutual fund house popularity, etc., can also influence fund performance, which can be accounted for in future studies. Further, the relationship could be tested using other advanced econometric models, including panel or dynamic panel models.

Author's Contribution

Dr. Tarun K. Soni is the sole author of this paper. He conceived the idea and developed qualitative and quantitative designs for the empirical study. Dr. Tarun K. Soni extracted research papers with a high reputation, filtered these based on keywords, and generated concepts and codes relevant to the study design. Finally, he verified the analytical methods, did the numerical computations using MS Excel, and wrote the final manuscript.

Conflict of Interest

The author certifies that he has no affiliations with or involvement in any organization or entity with any financial interest or non-financial interest in the subject matter or materials discussed in this manuscript.

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