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Performance of Socially Responsible Portfolios Across Sectors in Indian Stock Market

Vanita Tripathi*, Varun Bhandari**

Abstract ***Purpose:*** *The question of whether socially responsible stocks outperform or underperform general stockshas been of keen interest for various researchers and academicians. This paper seeks to empirically examine the performance of socially responsible portfolios across various sectors and index of socially responsible and general companies in Indian stock market.*

Design/Methodology/Approach: *We have taken up S&P ESG and CNX NIFTY as the indices of socially responsible and general companies respectively. ESG index has been classified into six different sectors on the basis of GICS. Performance has been evaluated in terms of risk, return and various risk-adjusted measures like Sharpe ratio, Treynor ratio, Double Sharpe ratio, Modified Sharpe ratio, M2 measure, Jensen's alpha, Fama's decomposition measure, etc. We have also checked whether market model is sufficient to explain cross sectional variation in stock returns or we need Fama-French three factor model. The study period ranges from January 1996 – December 2013 and it is further divided into different sub-periods.*

Findings: *We find that socially responsible stocks across IT, FMCG and financial sectors are well rewarding in Indian stock market by generating significantly higher returns and outperforming the two indices on the basis of risk-adjusted measures employed during 18 year period and different sub-periods. The results uphold even with the use of market model and Fama-French three factor model by generating highest significant excess returns.*

Originality/Value: *There is no empirical evidence on the performance evaluation of socially responsible portfolios across different sectors. Hence this study is first of its kind. This will help investors in selecting best sector for investment in socially responsible companies.*

Implications: *Significant higher returns of ESG index and socially responsible stocks across different sectors make Socially Responsible Investing (SRI) a betterinvestment vehicle for investors in India. This is the time when general companies should change their approach and agenda towards CSR and start considering ESG issues as their investment themes. The regulators, policy makers and mutual funds should come up with different socially responsible products and sectoral indices to initiate the movement of SRI across different sectors in India.*

Keywords *Socially Responsible Investing, ESG Index, NIFTY Index, Risk-Adjusted Measures, Market Model, Fama-French Three Factor Model*

INTRODUCTION

With increasing concerns of environmental, social and governance (ESG) issues, the concept of socially responsible investing (SRI) becomes all the more important in today's financial world. In simple words, SRI means investment in companies after considering ESG practices rather than just financial performance of companies. It can also be defined as a process of identifying and investing in a company that meets certain standards of CSR and is increasingly practiced internationally. Thus, ESG issues can also be resolved by considering effective and efficient CSR policy. The Indian Companies Act, 2013 makes it mandatory for certain companies to contribute at least 2% of the average net profits of preceding three financial years towards CSR and society welfare activities. However, enforcement and effective implementation of such a law is still in doubt because companies can easily find ways from escaping such a responsibility. Tripathi and Bhandari (2014) have argued that SRI can bolster the CSR law and said, "Unless the investors turn socially responsible, CSR principles cannot be enforced in practice".

The growing awareness of ESG issues is changing the perception of investors and attracts lot of investors' attention towards SRI worldwide. However, the main concern in the mind of investors is that whether investment in socially responsible products may generate returns lower than the general products and hence forego part of their returns by being socially responsible. Hence, investors feel reluctant while making investment in socially responsible products.

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Extant literature is available on comparing performance of socially responsible index/fund with general index/fund. But sector specific performance of socially responsible index has not been done so far to the best of our knowledge.

This paper examines an interesting question – whether socially responsible stocks across different sectorsoutperformthe index of socially responsible companies and general companies? This will help investors in knowing which sector performs the best amongst all sectors and invest their funds in that specific sector instead of investing in socially responsible index. The key objectives of this paper are:

1. To examine whether socially responsible stocks across different sectors generated significantly higher returns than the index of socially responsible companies and general companies.
2. To check whether socially responsible stocks across different sectors outperformed index of socially responsible companies and general companies on the basis of various risk-adjusted measures.
3. To assess the performance of socially responsible stocks across different sectorson the basis of net selectivity return.
4. To analyse the impact of Market Model and Fama-French Three Factor Model on the excess returns of socially responsible stocks across different sectors and index of socially responsible and general companies.

The rest of this paper is organised as follows. Second section provides brief review of literature on comparing performance of socially responsible products with general products. Third section describes the data and methodology of the research work. Fourth section provides the empirical evidence and discussion of results while fifth section concludes the research.

REVIEW OF LITERATURE

The main focus of the existing literature relies on matching performance of various socially responsible indices/ funds with conventional indices/funds. To the best of our knowledge, not much empirical work has been done so far in the context of different sectors of socially responsible companies.

Hamilton, Jo, and Statman (1993) claimed that market does not price social responsibility characteristics because theyfind that socially responsible mutual funds were not able to earn statistically significant excess returns and performance of such funds was not statistically different from the performance of conventional mutual funds.

Luther and Matatko (1994) attempted to determine whether SRI funds outperformed the market index (FT All-Share) and small company index (HGSC). Using single factor CAPM, they found that out of 9 SRI funds, 8 underperformed the FT market index. But none of the alphas were found to be statistically significant.

Gregory, Luther, and Matatko (1997) find the underperformance of SRI funds compared with conventional funds using two factor model but the results were not found to be statistically significant. However, Guerard (1997) compared the returns of 1300 equity stocks and 950 ethically screened stocks and find no significant differences in the average returns over the period 1987-94. Using value and growth, he reported significantly better performance by ethically screened stocks.

Goldreyer and Diltz (1999) compared the socially responsible and conventional mutual funds of US using various risk-adjusted techniques. Their results did not provide clear advantage to either group. Statman (2000) reported that Domini Social Index performed as well as the S&P 500 over the period 1990-98. He finds no statistical significant difference in the returns of 31 SRI funds and 62 conventional funds.

Bauer, Koedijk, and Otten (2005) compared the risk-adjusted returns of 103 SRI funds from Germany, UK and USA with conventional funds for the period 1990-2001 using multi-factor model. The results evidenced that SRI funds from Germany and USA underperformed the market and conventional funds whereas UK SRI funds slightly outperformed.

Shank, Manullang, and Hill (2005) analysed the performance of socially responsible mutual funds (SRMF), NYSE composite index and a portfolio made up of firms most valued by SRMF managers (Most SRF). They reported that Most SRF did no better or worse than NYSE or SRMF in 3-5 years comparisons. However, long-run (10 year) results showed that market values social responsibility and hence, Most SRF outperformed the two indices.

Amenc and Sourd (2008) established that socially responsible funds in France did not produce both positive and statistically significant alpha over six year period ending in December 2007 using Fama-French three factor model. Galema, Plantinga, and Scholtens (2008) tried to investigate the effect of SRI on stock returns. They find that SRI impacts the stock returns by lowering the book-to-market ratios and not by generating positive alphas.

Mollet and Ziegler (2012) empirically examined the relationship between SRI and stock performance in US and entire European stock markets over the period 1998-2009 by employing Carhart four factor model. They found that SRI is associated with large-sized firms and insignificant abnormal returns in both US and European stock markets.

Tripathi and Bhandari (2012) tried to examine whether there is a significant difference in the returns of various green

and non-green stocks portfolio and found that green blue chip stocks portfolio generated significantly higher returns than market returns implying that green investing was more rewarding during the crisis period.

Bhanumurthy, Bhandari, and Pandey (2014) checked whether price discovery and returns of socially responsible companies is higher than general companies or not. They found that both price discovery and returns of socially responsible companies was significantly better than general companies both during and post crisis period.

Tripathi and Bhandari (2015a) have compared the performance of socially responsible stocks portfolios with general stocks portfolios over different business economic conditions. They find that socially responsible portfolios generated significantly higher returns than general portfolios and outperformed them using single factor alpha and multi factor alpha. Their findings support the view that socially responsible investing is boon for investors in India.

Tripathi and Bhandari (2015b) contributed to the related literature by analysing the performance of socially responsible stocks portfolio and general stocks portfolio in Indian stock market using various risk-adjusted measures over the period 1996-2013. They find that socially responsible stocks portfolio generated significantly higher returns as compared to other portfolios especially during crisis period.

Tripathi and Bhandari (2015c) have compared the performance of ethical mutual funds with their conventional peers and reported that despite having higher risk, ethical funds outperformed on the basis of various risk-adjusted measures and net selectivity returns.

Tripathi and Bhandari (2015d) evaluated the performance of socially responsible stocks portfolios and general stocks portfolios over different domestic market conditions (bull and bear). The results specified that SRI can be used as a win-win investment criterion in any domestic market condition.

DATA AND METHODOLOGY

Data and Sources

The study evaluates the performance of socially responsible companies (ESG Index), general companies (NIFTY Index) and the various sectors of ESG index over the 18 year period January 1996 – December 2013. We have divided all the companies listed in S&P ESG India Index into six broad sectors on the basis of Global Industrial Classification Standard (GICS). The names of six sectors are mainly:Fast Moving Consumer Goods (FMCG), Financials, Healthcare, Information Technology (IT), Materials, and Miscellaneous. FMCG includes consumer discretionary and consumer staples. Miscellaneous includes four main sectors but the number of companies in each specific sector was very less. Hence, we have combined all the companies in these sectors and named it as Miscellaneous. The names of four sectors which we combined were – Industrials, Energy, Utilities, and Telecommunication Services. The calculations are done on the basis of stock price data of companies in these specific sectors. Monthly adjusted closing index values and company stock prices were collected from PROWESS database of CMIE (Centre for monitoring Indian economy). These values are then converted into simple percentage returns1 as (Pt– Pt-1)/Pt-1. Implicit yield on 91 days T-bills have been taken as a proxy for risk-free rate of return. Next we calculated descriptive statistics, portfolio beta and various risk adjusted measures for performance evaluation. The analysis has been done for total period (18 years) to evaluate the returns over a longer period and different sub-periods of 9 years and 6 years each.

Methodology

Ample empirical work has been done so far on performance of socially responsible indices and conventional indices but not much empirical work has been done with respect to performance of various sectors of theses socially responsible indices. We,in this paper, are building new methodology for assessing the performance of various sectorsover the longer and shorter period of time. To accomplish our objectives, following hypotheses have been tested:

1. There is no significant difference in the returns of ESG index, NIFTY index and socially responsible stocks across different sectors.
2. Performance of socially responsible stocks across different sectors is similar to the performance of ESG index and NIFTY index using various risk adjusted measures.
3. There is no difference in the performance of socially responsible stocks across different sectorson the basis of net selectivity return.
4. Market Model and Fama-French Three Factor Model does not have any significant impact on the performance of ESG index, NIFTY index and socially responsible stocks across different sectors.

Risk Adjusted Measures for Performance Evaluation

Sharpe Ratio

This ratio measures the return of the portfolio in excess of risk-free, compared to total risk of the portfolio. If ARP is

1 We have not used log returns because we need to construct portfolios out of the companies and in that case we calculate simple average returns of companies.

the average monthly portfolio return,RFthe monthly risk free return andPportfolio totalrisk then Sharpe ratio can be calculated as:

$$\text{Sharpe ratio} = \frac{AR_P - R_F}{\sigma_P}$$

Treynor Ratio

This ratio measures the relationship between return of the portfolio, above the risk-free rate, and its systematic risk indicated by portfolio beta (β_P). It can be calculated as:

$$\text{Treynor ratio} = \frac{AR_P - R_F}{\beta_P}$$

Modified Sharpe Ratio

Israelsen (2005) argued that Sharpe ratio may lead to spurious ranking when excess returns of portfolios are negative. In that case, the portfolio with higher ratio is not always the best. Israelsen proposes to correct this anomaly by modifying the standard Sharpe ratio by introducing an exponent to the denominator of Sharpe ratio. This ratio consistently ranks various portfolios whether the portfolio excess returns are positive or negative. It can be calculated as:

$$\text{Modified Sharpe Ratio} = \frac{AR_P - R_F}{\sigma_p^{[(AR_P - R_F)/ABS(AR_P - R_F)]}}$$

Double Sharpe Ratio

Since Sharpe ratio considers only sample of returns, this ratio is being used to represent the whole population of returns. Estimation of this ratio requires series of Sharpe ratio using individual return, standard deviation and risk free rate. This ratio measures the average of Sharpe ratios compared to volatility (standard deviation) of the Sharpe ratios. It can be calculated as:

$$\text{Double Sharpe Ratio} = \frac{A(S_P)}{\sigma(S_P)}$$

where, A (S_P) = Average of Sharpe Ratios

σ (SP) = Standard Deviation of Sharpe Ratios

M^2 Measure

Modigliani and Modigliani (1997) showed that portfolio and its benchmark must have the same level of risk to be compared in terms of risk-adjusted performance. But the question arises how do we create portfolios with the same level of risk as of benchmark and then compare their returns. In order to compute this measure, we imagine that a particular risky portfolio (P) is mixed with risk-free asset (T-bills), so that the resultant or adjusted portfolio (P*) matches the volatility of market portfolio (CNX 500 Equity Index). The adjusted portfolio (P*) would then have the same standard deviation as that of market index. With the same standard deviation of market index and managed portfolio, we may evaluate their performance by comparing returns.

$$M^2 = R_P^* - R_M$$

where, RP* = Return of Managed Portfolio

RM = Return of Market Portfolio

Single Factor Alpha

It is used to determine the abnormal return(α) of a security or portfolio of securities over the theoretical expected return. The theoretical return is predicted by a market model. A portfolio with a consistently positive excess return (adjusted for risk) will have a positive alpha and vice-versa. It can be calculated as:

$$R_P - R_F = \alpha + \beta_P (R_M - R_F)$$

Three Factor Alpha

Several studies have employed a single factor CAPM or market model to measure the performance of socially responsible and general stocks portfolios. Apart from market risk, there could be other factors as well which may potentially affect the cross section variation in portfolio return like size effect, value effect, momentum effect etc. The uniqueness of this paper is that we have used Fama-French three factor model to find out alpha (or excess return). It can be estimated as:

$$R_P - R_F = \alpha + \beta_1 (R_M - R_F) + \beta_2 (SMB) + \beta_3 (HML)$$

where, α =Multi Factor Alpha

SMB = Small Minus Big (Size Effect)

HML = High Minus Low (Value Effect)

Information Ratio

It is also known as Appraisal Ratio and is defined as residual return of the portfolio divided by tracking error, where residual return is the difference between the return of the portfolio and the return of a selected benchmark index and tracking error is the standard deviation of residual return. It can be calculated as:

$$\text{Information Ratio} = \frac{E[R_P - R_B]}{\sigma_{ep}} = \frac{\alpha_P}{\sigma_{ep}}$$

where, αP=Jensen's alpha or abnormal return of the portfolio

ep=Unsystematic risk of the portfolio

Fama's Decomposition Measure

Another distinct feature of this paper is the use of Fama's Decomposition Measure in portfolio's performance evaluation. Fama (1972) decomposed the alpha produced by CAPM model into non-diversification, net selectivity, and diversification. In terms of Fama's framework, a portfolio's excess return constitutes the following three main components:

(a) Compensation for non-diversification (Systematic risk) = $\beta_p (R_M - R_F)$

(b) Compensation for diversification (Unsystematic risk) = $(R_M - R_F) [(\sigma_P/\sigma_M) - \beta_P]$

(c) Net selectivity = $(R_P - R_F) - (\sigma_P/\sigma_M) (R_M - R_F)$ = Selectivity – Compensation for unsystematic risk

Fama's decomposition takes advantage of the ability to convert risks into their return equivalents. Thus, both return and risk are analysed, but risk is expressed in terms of the return gained or foregone to achieve that level of risk. Selectivity is the portion of the excess return that is not explained by the portfolio beta and the market risk premium. Selectivity includes diversification and net selectivity. Compensation for unsystematic risk is the difference between the return that should have been earned according to capital market line (CML) and the return that should have been earned according to the security market line (SML). We can determine how much of the risk premium comes from ability to select stocks (net selectivity) by subtracting diversification from selectivity. A positive net selectivity indicates superior performance for a portfolio.

T-Test

In order to check whether there is a significant difference between the returns of socially responsible companies (ESG Index), general companies (NIFTY Index) and different sectors of ESG index, we have used paired samples t-test. In applying that, we compare the returns for the whole period as well as for various sub-periods.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{S_1^2}{n_1} + \frac{S_2^2}{n_2}}}$$

where, $\bar{x}_1$ and $\bar{x}_2$ are the returns of two portfolios

S_1 and S_2 are the standard deviations of two portfolios

n_1 and n_2 are the sizes of two portfolios.

Market Model – Analysis for Whole Period

To check if there is a significant difference in the alphas and slope (beta values) of both indices and different sectors of ESG index during the overall period of 18 years, we have estimated equation (1) in respect of all indices or sectors. The market model estimates the expected return of a portfolio on the basis of a single factor i.e. market risk premium. The alpha of the model shows return over and above its theoretical expected return while its slope captures the sensitivity of a portfolio's return vis-à-vis market return.

$$R_P - R_F = \alpha + \beta (R_M - R_F) \quad \ldots. (1)$$

where, R_P = Return of i^{th} Index/Sector

R_F = Risk-Free Rate of Return

R_M = Return of CNX 500 Equity Index

α = Excess Return in respect of return of ith Index/Sector

β = Slope or Beta of i^{th} Index/Sector return

i covers two indices (ESG & NIFTY) and six sectors of ESG index.

Fama-French Three Factor Model – Analysis for Whole Period

Several studies have employed single factor CAPM model to measure the performance of different portfolios. The intercept of the model (Jensen's Alpha) provides an indication of whether socially responsible portfolios outperform or underperform other portfolios and by how much. It is a general trend that market risk alone represents two-third of the total systematic risk of the portfolio/security. To control for factors such as size premium and value premium which can potentially affect the cross section variation in stock returns, we also estimate the following three factor Fama-French model for the whole period (18 years).

$$R_P - R_F = \alpha + \beta_1 (R_M - R_F) + \beta_2 (SMB) + \beta_3 (HML) \quad \ldots..(2)$$

where, β_1, β_2 and β_3 are the slopes in time series regressions. SMB is equally weighted average returns of firms with the lowest 30% market capitalisation minus the equally weighted average returns of firms with the highest 30% market capitalisation. HML is equally weighted average returns of firms with the highest 30% book-to-market ratios minus the equally weighted average returns of firms with the lowest 30% book-to-market ratios.

Table 1: Return, Risk and Various Risk Adjusted Measures

Portfolios	18 Year	9 Year Period		6 Year Period		
	1996-2013	1996-2004	2005-2013	1996-2001	2002-2007	2008-2013
Average (%)						
ESG Index	2.246	3.018	1.473	2.066	3.906	0.765
NIFTY Index	1.178	1.043	1.312	0.498	2.689	0.347
FMCG	2.124	2.560	1.688	1.568	3.298	1.506
Financials	2.573	3.104	2.042	2.247	3.999	1.473
Healthcare	2.131	3.193	1.068	1.997	3.965	0.430
Information Technology	3.652	5.810	1.494	7.033	2.663	1.260
Materials	2.037	2.502	1.572	0.373	5.201	0.537
Miscellaneous	1.614	1.995	1.232	0.717	4.202	-0.078
Std. Deviation (%)						
ESG Index	8.846	9.024	8.638	9.385	7.127	9.647
NIFTY Index	7.444	7.432	7.487	7.613	6.664	7.869
FMCG	8.154	8.781	7.490	8.581	8.182	7.659
Financials	11.139	10.977	11.324	12.096	8.332	12.513
Healthcare	10.027	10.297	9.680	10.489	8.371	10.861
Information Technology	14.667	18.654	8.652	21.529	8.762	9.631
Materials	11.774	12.692	10.817	12.327	10.675	11.773
Miscellaneous	9.127	8.917	9.359	8.679	8.018	10.107
Coefficient of Variation						
ESG Index	3.939	2.989	5.865	4.542	1.825	12.613
NIFTY Index	6.319	7.124	5.704	15.289	2.478	22.699
FMCG	3.839	3.430	4.436	5.473	2.481	5.084
Financials	4.329	3.537	5.544	5.384	2.083	8.493
Healthcare	4.706	3.225	9.061	5.254	2.111	25.235
Information Technology	4.016	3.211	5.792	3.061	3.290	7.646
Materials	5.779	5.073	6.879	33.019	2.052	21.921
Miscellaneous	5.656	4.469	7.595	12.097	1.908	-129.891
Beta						
ESG Index	1.018	0.982	1.057	0.978	0.940	1.112
NIFTY Index	0.880	0.837	0.929	0.814	0.945	0.912
FMCG	0.784	0.776	0.791	0.752	0.798	0.818
Financials	1.057	0.883	1.247	0.892	0.944	1.321
Healthcare	0.927	0.873	0.986	0.835	0.889	1.039
Information Technology	1.247	1.623	0.821	1.937	0.830	0.881
Materials	1.054	0.900	1.225	0.779	1.066	1.292
Miscellaneous	0.949	0.811	1.103	0.697	1.063	1.110

Table 1: (*Contd.*)

Portfolios	18 Year	9 Year Period		6 Year Period		
	1996-2013	1996-2004	2005-2013	1996-2001	2002-2007	2008-2013
Systematic Risk (%)						
ESG Index	8.315	8.288	8.381	8.676	6.362	9.489
NIFTY Index	7.188	7.064	7.366	7.221	6.396	7.783
FMCG	6.404	6.549	6.272	6.671	5.401	6.981
Financials	8.634	7.452	9.887	7.913	6.390	11.273
Healthcare	7.572	7.368	7.818	7.408	6.017	8.867
Information Technology	10.186	13.698	6.510	17.184	5.618	7.518
Materials	8.609	7.596	9.713	6.911	7.215	11.026
Miscellaneous	7.752	6.845	8.746	6.183	7.195	9.473
Unsystematic Risk (%)						
ESG Index	3.019	3.569	2.090	3.577	3.212	1.734
NIFTY Index	1.934	2.310	1.343	2.412	1.872	1.165
FMCG	5.047	5.850	4.094	5.397	6.146	3.151
Financials	7.037	8.059	5.520	9.148	5.347	5.431
Healthcare	6.572	7.193	5.708	7.426	5.819	6.273
Information Technology	10.553	12.663	5.699	12.969	6.723	6.019
Materials	8.031	10.168	4.761	10.208	7.867	4.128
Miscellaneous	4.818	5.715	3.331	6.090	3.539	3.524
Sharpe Ratio						
ESG Index	0.1866	0.2653	0.1050	0.1435	0.4807	0.0186
NIFTY Index	0.0783	0.0564	0.0997	-0.0291	0.3314	-0.0303
FMCG	0.1876	0.2205	0.1499	0.0989	0.3444	0.1203
Financials	0.1776	0.2259	0.1304	0.1263	0.4224	0.0710
Healthcare	0.1532	0.2495	0.0519	0.1218	0.4163	-0.0142
Information Technology	0.2084	0.2780	0.1073	0.2932	0.2491	0.0700
Materials	0.1225	0.1480	0.0931	-0.0281	0.4423	-0.0041
Miscellaneous	0.1116	0.1538	0.0712	-0.0002	0.4641	-0.0656
Double Sharpe Ratio						
ESG Index	0.0861	0.1162	0.0628	-0.0543	0.3820	-0.0353
NIFTY Index	0.0781	0.0563	0.0992	-0.0291	0.3314	-0.0301
FMCG	0.0816	0.0324	0.1257	-0.1047	0.1790	0.1529
Financials	-0.0633	-0.0922	0.0492	-0.1196	0.2593	-0.0014
Healthcare	0.0671	0.0310	0.0899	-0.1441	0.3282	0.0899
Information Technology	0.0960	0.0934	0.0982	0.0199	0.2207	0.0784
Materials	-0.0252	-0.0195	-0.0301	-0.2095	0.2610	-0.1269
Miscellaneous	0.0157	0.0603	-0.0286	-0.0710	0.3365	-0.1731

Table 1: (*Contd.*)

Portfolios	18 Year	9 Year Period		6 Year Period		
	1996-2013	1996-2004	2005-2013	1996-2001	2002-2007	2008-2013
Modified Sharpe Ratio						
ESG Index	0.1866	0.2653	0.1050	0.1435	0.4807	0.0186
NIFTY Index	0.0783	0.0564	0.0997	-0.0002	0.3314	-0.0002
FMCG	0.1876	0.2205	0.1499	0.0989	0.3444	0.1203
Financials	0.1776	0.2259	0.1304	0.1263	0.4224	0.0710
Healthcare	0.1532	0.2495	0.0519	0.1218	0.4163	-0.0002
Information Technology	0.2084	0.2780	0.1073	0.2932	0.2491	0.0700
Materials	0.1225	0.1480	0.0931	-0.0004	0.4423	-0.0001
Miscellaneous	0.1116	0.1538	0.0712	0.0000	0.4641	-0.0007
Treynor Ratio						
ESG Index	0.0162	0.0244	0.0086	0.0138	0.0364	0.0016
NIFTY Index	0.0066	0.0050	0.0080	-0.0027	0.0234	-0.0026
FMCG	0.0195	0.0249	0.0142	0.0113	0.0353	0.0113
Financials	0.0187	0.0281	0.0118	0.0171	0.0373	0.0067
Healthcare	0.0166	0.0294	0.0051	0.0153	0.0392	-0.0015
Information Technology	0.0245	0.0320	0.0113	0.0326	0.0263	0.0077
Materials	0.0137	0.0209	0.0082	-0.0044	0.0443	-0.0004
Miscellaneous	0.0107	0.0169	0.0060	0.0000	0.0350	-0.0060
M2 Measure (%)						
ESG Index	0.8049	1.4800	0.1527	1.3919	0.6433	0.5020
NIFTY Index	-0.0796	-0.2833	0.1109	-0.1391	-0.3666	0.0845
FMCG	0.8126	1.1011	0.5085	0.9959	-0.2789	1.3695
Financials	0.7313	1.1471	0.3541	1.2390	0.2489	0.9488
Healthcare	0.5318	1.3463	-0.2683	1.1991	0.2077	0.2215
Information Technology	0.9831	1.5867	0.1706	2.7204	-0.9239	0.9407
Materials	0.2813	0.4894	0.0580	-0.1302	0.3834	0.3082
Miscellaneous	0.1925	0.5386	-0.1153	0.1169	0.5315	-0.2167
Single Factor Alpha (%)						
ESG Index	0.9242***	1.6601***	0.1885	1.4714***	0.9690**	0.5612***
NIFTY Index	-0.0451	-0.2058	0.1149	-0.1178	-0.2581	0.0745
FMCG	0.9653***	1.3475**	0.5835	0.9326	0.7290	1.2022***
Financials	1.2184***	1.8084**	0.6286	1.6272	1.0558*	1.3415**
Healthcare	0.8690**	1.9070***	-0.1683	1.3709	1.1601*	0.2020
Information Technology	2.1643***	3.9611***	0.3697	6.5312***	0.0151	0.9770
Materials	0.6845	1.1953	0.1739	-0.2590	1.9374**	0.3950
Miscellaneous	0.3372	0.7575	-0.0830	0.0759	0.9465**	-0.2823

Table 1: (*Contd.*)

Portfolios	18 Year	9 Year Period		6 Year Period		
	1996-2013	1996-2004	2005-2013	1996-2001	2002-2007	2008-2013
Three Factor Alpha (%)						
ESG Index	0.8198***	1.4107***	0.2683	1.5534***	0.4814	0.6868***
NIFTY Index	0.0848	-0.0733	0.1947*	0.0809	-0.1334	0.1358
FMCG	0.7847**	1.1927**	0.3362	1.1171	-0.1533	1.1631***
Financials	1.6888***	1.9593**	1.5747***	1.5863	1.6948***	1.8981***
Healthcare	0.1795	1.0069	-0.5336	0.4367	0.4171	-0.1337
Information Technology	1.0231	2.5922**	-0.1890	4.8003***	-0.8994	0.5508
Materials	0.7044	1.0765	0.1593	0.8272	0.9505	0.4893
Miscellaneous	0.9012***	1.3493***	0.3707	1.0846	1.1828**	0.1471
Information Ratio						
ESG Index	0.3042	0.4619	0.0901	0.4089	0.3027	0.3237
NIFTY Index	-0.0258	-0.0936	0.0857	-0.0517	-0.1376	0.0639
FMCG	0.1912	0.2302	0.1428	0.1738	0.1196	0.3815
Financials	0.1731	0.2245	0.1139	0.1785	0.1974	0.2470
Healthcare	0.1322	0.2650	-0.0294	0.1854	0.2001	0.0322
Information Technology	0.2047	0.3122	0.0649	0.5045	0.0024	0.1623
Materials	0.0852	0.1175	0.0365	-0.0248	0.2464	0.0957
Miscellaneous	0.0698	0.1322	-0.0251	0.0133	0.2676	-0.0801

****significant at 1% **significant at 5% *significant at 10%*

EMPIRICAL RESULTS

Table 1 reports the performance of socially responsible companies named as ESG index, general companies (NIFTY index) and performance of socially responsible stocks across different sectorsover the period of 18 years and different sub-periods. Table 1 infers that socially responsible companies outperformed general companies in terms of return, relative risk and various risk-adjusted measures. Out of different sectors, Information Technology (IT) sector of ESG Index generated higher return than that of other sectors followed by Financials sector in the same index. IT sector had generated the highest monthly average return 3.65% followed by Financials with 2.57%. Besides of higher returns, these two sectors are the most risky sectors among all other sectors as their standard deviation is very high. The least risky sector for investment in socially responsible stocks is FMCG since its coefficient of standard deviation is lowest (i.e. 8.15%). But at the same time, return of FMCG sector is also low. Thus, this is not alucrative sector of investment from the view point of investors. However, if we consider the relative measure of risk i.e. coefficient of variation, we found that FMCG sector had produced the lowest coefficient (3.84) followed by IT sector (4.02) and Financial sector (4.33). Hence, these two sectors (IT and Financials) were the most defensive sectors among all other sectors and there is absolutely no penalty by investing in these sectors. Results also showed that IT sector has highest beta of 1.247 followed by Financials sector with 1.057. This suggests that these two sectors are more sensitive to market conditions than other sectors. When we decompose our total risk into systematic and unsystematic risk, we find that IT and Financials sectors were the most risky sectors for investment.

As far as various risk adjusted measures are concerned, we have got similar results. IT is the only sector that has outperformed all other sectors in terms of various risk adjusted measures used. Higher risk in IT sector generated higher returns and as a result a high Sharpe ratio of 0.208, which indicates highest return per unit of total risk. Because of negative excess return limitation of Sharpe ratio, Israelsen (2005) introduced Modified Sharpe ratio and the results were again in favour of IT sector. This ratio should only be used as a ranking criterion. Similarly, results of double Sharpe ratio also indicated that IT sector could be used as a safer sector for investment in socially responsible

stocks. Moreover, the results of Treynor ratio showed that IT sector has generated the highest return per unit of total systematic risk (0.024%). M2 measure determines that on creating portfolios with the same level of risk equivalent to market portfolio (CNX 500), all the sectors of socially responsible companies(especially IT sector) showed positive values which further describes that these sectors generated returns higher than that of market index. Positive and significant high single factor Jensen's alpha of IT sector (2.16%) signifies that this sector is generating highest abnormal returns during the overall period. Thereafter, we employed Fama-French three factor model to capture the variation in stock returns. Financial sector generated the highest significant three factor alpha of 1.69% during the overall period. It shows that apart from market risk premium, size premium and value premium there could be other factors as well which may affect cross sectional variation in stock returns of different sectors. It is worth noting that all the sectors of socially responsible companies are generating positive single factor and three factor alphas. A high information ratio of IT sector (0.205) shows that an investor can achieve higher returns more efficiently by taking on additional risk. Hence, from the above discussion it is clearly visible that over a longer period of time (18 years), IT sector was the most rewarding sector among all other sectors. Thus, investors can earn higher returns by parking their funds in IT sector of ESG Index.

When we divided the data into two sub-periods of nine years each, we got some more insights about various industries. In the first 9 year period, IT sector has produced the highest monthly average return of 5.81%. However, in the second 9 year period, it is the Financials sector that produced highest monthly average return of 2.04% followed by FMCG sector with the return of 1.69%. On the basis of coefficient of variation, we found that IT and FMCG sectors were the most protective sectors during the first and second 9 year sub-period respectively. During both the sub-periods, systematic and unsystematic risk of FMCG sector was lowest among all other sectors. IT sector and FMCG sector outperformed all other sectors in terms of all risk-adjusted measures during first and second 9 year sub-period respectively.

When we divided the total period of 18 years into different sub-periods of 6 years each and found that IT sector again produced the highest monthly average return of 7.03% during the first 6 year sub-period. However, Material

Table 2: Fama's Decomposition Measure for Different Sectors of ESG Index

Portfolios	Risk Premium (%)	Risk Premium due to (%)				Ranking on the basis of
18 Year Period (Jan. 96 – Dec. 13)		**Systematic Risk**	**Selectivity**	**Unsystematic Risk**	**Net Selectivity**	**Net Selectivity**
FMCG	1.527	0.562	0.965	0.154	0.811	3
Financials	1.976	0.758	1.218	0.220	0.998	2
Healthcare	1.533	0.664	0.869	0.215	0.653	4
Information Technology	3.054	0.894	2.160	0.393	1.767	1
Materials	1.440	0.756	0.684	0.278	0.407	5
Miscellaneous	1.016	0.680	0.336	0.121	0.215	6
First 9 Year Period (Jan. 96 – Dec. 04)						
FMCG	1.936	0.589	1.346	0.201	1.146	4
Financials	2.479	0.674	1.805	0.313	1.492	3
Healthcare	2.569	0.663	1.906	0.263	1.642	2
Information Technology	5.186	1.233	3.953	0.446	3.507	1
Materials	1.878	0.684	1.194	0.459	0.736	5
Miscellaneous	1.371	0.616	0.755	0.186	0.569	6
Second 9 Year Period (Jan. 05 – Dec. 13)						
FMCG	1.117	0.534	0.584	0.104	0.480	2
Financials	1.471	0.841	0.630	0.122	0.508	1
Healthcare	0.497	0.665	-0.168	0.158	-0.326	6
Information Technology	0.923	0.554	0.369	0.182	0.187	3
Materials	1.001	0.826	0.175	0.094	0.081	4

Table 2: (*Contd.*)

Miscellaneous	0.661	0.744	-0.083	0.052	-0.135	5
First 6 Year Period (Jan. 96 – Dec. 01)						
FMCG	0.848	-0.089	0.938	-0.025	0.963	4
Financials	1.527	-0.106	1.633	-0.056	1.689	2
Healthcare	1.277	-0.099	1.376	-0.041	1.418	3
Information Technology	6.313	-0.230	6.543	-0.058	6.602	1
Materials	-0.346	-0.092	-0.253	-0.072	-0.181	6
Miscellaneous	-0.002	-0.083	0.081	-0.033	0.114	5
Second 6 Year Period (Jan. 02 – Dec. 07)						
FMCG	2.818	2.083	0.735	1.072	-0.337	5
Financials	3.519	2.464	1.055	0.749	0.306	3
Healthcare	3.485	2.320	1.164	0.908	0.257	4
Information Technology	2.183	2.166	0.016	1.212	-1.196	6
Materials	4.721	2.782	1.939	1.334	0.605	2
Miscellaneous	3.722	2.774	0.947	0.317	0.629	1
Third 6 Year Period (Jan. 08 – Dec. 13)						
FMCG	0.913	-0.287	1.200	-0.028	1.228	2
Financials	0.880	-0.463	1.344	-0.051	1.395	1
Healthcare	-0.162	-0.364	0.202	-0.082	0.284	5
Information Technology	0.667	-0.309	0.976	-0.087	1.063	3
Materials	-0.056	-0.453	0.397	-0.031	0.428	4
Miscellaneous	-0.671	-0.389	-0.281	-0.026	-0.255	6

(5.20% per month) and FMCG (1.51% per month) sectors were the highest return generating sectors during second and third 6 year sub-periods respectively. When we considered the relative measure of risk and return i.e. coefficient of variation, we found that IT, Material and FMCG sectors have generated the least coefficient during the first, second and third 6 year sub-period respectively. IT and Material sectors were the most risky sectors on the basis of systematic and unsystematic risk during the first and second 6 year sub-periods respectively. However, during the third 6 year sub-period, FMCG sector was proved to be least risky sector because this period also includes the break period of crisis and this sector was least impacted. The results were more promising when we apply different risk-adjusted measures.

Therefore, through the integration of environmental, social and governance concerns into investment styles, investors can enhance the value of their portfolio and take a step towards sustainable development.

Table 2 shows the results of Fama's decomposition measure for the various sectors of S&P ESG India Index during the 18 year, 9 year and 6 year sub-periods. During the 18 year, first 9 year and first 6 year sub-period, it is found that risk premium of IT sector was highest among all other sectors. It shows that return of IT sector is higher than the return of other sectors and as a result shows higher excess returns for IT sector. However, Financial, Materials and FMCG sectors have generated highest risk premium during the second 9 year, second and third 6 year sub-periods respectively. Thus, it shows the minimum willingness to accept compensation for the risk. It must be noted that IT sector provided much higher compensation for non-diversification to the investors as compared to other sectors during the whole 18 year period and different 9 year and 6 year sub-periods. This is because of the fact that IT sector was less diversified as compared to other sectors. This may be due to the reason that majority of socially responsible companies were from Financial, Material and Fast moving consumer goods (FMCG) sectors. However, the more interesting point to note here is that IT sector generated positive and highest risk premium due to net selectivity during the whole 18 year (1.77% per month), first 9 year (3.51% per month) and first 6 year sub-periods (6.60% per month). Thus, during these periods, IT sector outperformed other sectors even on net selectivity basis. This indicates that compromise with respect to diversification made by this component by investing in IT sector, was well

Table 3: Result of t-test for the Whole Period and Different Sub-Periods

Pairs	Differential Return (%)					
	18 Year Period	First 9 Year Period	Second 9 Year Period	First 6 Year Period	Second 6 Year Period	Third 6 Year Period
ESG - NIFTY	1.068***	1.975***	0.160	1.568***	1.217**	0.418
FMCG - ESG	-0.121	-0.458	0.215	-0.498	-0.608	0.741
Financial - ESG	0.327	0.085	0.569	0.180	0.093	0.708
Healthcare - ESG	-0.115	0.175	-0.404	-0.069	0.059	-0.334
IT - ESG	1.406**	2.791**	0.021	4.966***	-1.243*	0.495
Material – ESG	-0.208	-0.516	0.099	-1.693*	1.295*	-0.228
Miscellaneous - ESG	-0.632*	-1.023*	-0.241	-1.349*	0.296	-0.843**
FMCG - NIFTY	0.946***	1.516***	0.376	1.069*	0.609	1.159***
Financial - NIFTY	1.395***	2.060***	0.729	1.749*	1.310*	1.127
Healthcare – NIFTY	0.953**	2.149***	-0.244	1.498*	1.276*	0.084
IT – NIFTY	2.474***	4.766***	0.181	6.535***	-0.026	0.913
Material – NIFTY	0.859*	1.459	0.259	-0.125	2.512**	0.190
Miscellaneous - NIFTY	0.436	0.952*	-0.080	0.219	1.513***	-0.424

****significant at 1% **significant at 5% *significant at 10%*

rewarded in terms of higher returns. This also shows that companies which are from IT sector are outperforming the companies in other sectors. However, during the second 9 year and third 6 year sub-period, Financial sector generated the positive and highest net selectivity return followed by FMCG sector. Financial sector has earned the net selectivity return of 0.51% per month and 1.39% per month during the second 9 year and third 6 year sub-period respectively.

In Table 3 we have examined the difference in returns of socially responsible companies (ESG Index) and general companies (NIFTY Index). Returns of different sectors of ESG index are also being compared with ESG and NIFTY index. Over the 18 year period and different sub-periods, ESG index generated significantly higher return than NIFTY index. During the whole period, return of ESG index was higher by 1.07% per month than the return of NIFTY index. It signifies that by taking environmental, social and governance issues into account investors can derive financial benefits out of it.

Table 3 also shows that return of financial and IT sector is greater than the return of ESG index and thus showing positive return differential over the 18 year period and different sub-periods (except second 6 year period). During the overall 18 year period, the return of IT sector was greater by 1.41% per month and 2.47% per month than the returns of ESG and NIFTY index respectively. It must be noted that returns of different sectors of ESG index were significantly greater than the return of NIFTY index. IT sector generated significantly higher return than NIFTY index during the 18 year, first 9 year and first 6 year periods. However, in the remaining periods, it is the financial sector that generated higher return than NIFTY index. This shows that IT and financial companies of ESG index are continuously outperforming the NIFTY and ESG index by generating significantly higher returns.

Table 4: Result of t-test of Different Sectors using Benchmark Indices since Inception

Pairs	Differential Return (%)	P-value
SR FMCG Sector – FMCG Index	0.598	0.153
SR Financial Sector – Financial Index	0.475*	0.098
SR Healthcare Sector – Pharma Index	0.557	0.309
SR IT Sector – IT Index	1.063*	0.058
SR Material Sector – Material Index	0.392	0.248
SR Miscellaneous Sector – Miscellaneous Index	0.102	0.755

****significant at 1% **significant at 5% *significant at 10%*

In Table 4 we have compared the returns of different ESG sectors with their benchmark indices since inception. The

Table 5: Results of Market Model for Overall Period

Industries	Single-Factor Alpha (%)		Slope	
	Coefficient	P-Value	Coefficient	P-Value
ESG Index	0.924***	0.000	1.019***	0.000
NIFTY Index	-0.045	0.740	0.881***	0.000
Sectors of ESG Index				
SR FMCG	0.965***	0.006	0.785***	0.000
SR Financials	1.218**	0.012	1.058***	0.000
SR Healthcare	0.869**	0.056	0.928***	0.000
SR Information Technology	2.164***	0.003	1.243***	0.000
SR Materials	0.684	0.216	1.055***	0.000
SR Miscellaneous	0.337	0.312	0.949***	0.000

****significant at 1% **significant at 5% *significant at 10%*

result reveals that all sectors of ESG index are yielding higher returns than their benchmarks. However, it is to be noted here that only financial sector and IT sector are generating significantly higher returns. The return of financial sector and IT sector was higher by 0.48% per month and 1.06% per month than the returns of financial index and IT index. Thus, investors who invest in financial and IT sectors of ESG index are well rewarded in terms of higher returns in Indian stock market.

Table 5 shows the result of ESG index, NIFTY index and different sectors of ESG index on the parameters of market model. It is quite interesting that alpha values of ESG index and all the sectors of ESG index were positive. However, alpha values of ESG index and four sectors (FMCG, Financials, Healthcare and IT) were coming out to be statistically significant. ESG index is producing significant abnormal return of 0.92% per month (11.09% annually). From the different sectors, IT sector is generating highest significant excess return of 2.16% per month (25.97% annually) followed by financials sector (14.62% annually). This signifies that apart from market risk premium there could be some other factors in determining the expected return in case of socially responsible companies and their different sectors. It is interesting to mention here that all the socially responsible companies and their different sectors are yielding positive excess returns which denote that there is heavy demand for stocks of socially responsible companies, pushing their prices up and hence providing higher return accordingly and showing positive excess returns.However, alpha values of general companies (NIFTY index) were negative but insignificant during the period. It means that stock prices of general companies had fallen and investors do not rely on general companies anymore as they are giving lesser returns and hence start investing in socially responsible companies or different sectors of socially responsible companies (especially IT and Financial).

As per modern portfolio theory, during the study period (i.e. 18 years), the slope is significant for both socially responsible (ESG Index) as well as general companies (NIFTY Index). However, ESG index is showing highest significant slope (1.019) amongst the two. Moreover, the slope is also coming out to be significant for all the sectors of ESG index. Out of all sectors, IT sector (followed by financial sector) is showing highest significant slope of 1.243, which is higher than ESG index as well. Thus, socially responsible companies are more sensitive to market conditions than general companies and market factor is significantly able to explain the return of IT and Financial sectors.

Table 6 discusses the result of Fama-French three factor model. In Table 1 we reported that abnormal returns (single factor alpha) of all the socially responsible sectors and ESG index were statistically significant by employing market model. But excess return of general companies (NIFTY index) was not significant. It suggests that apart from market risk (single factor in market model), there could be other factors as well which may affect the excess return of socially responsible companies and their different sectors. The results of Fama-French three factor model shows that after controlling for market risk, size premium and value premium, multi-factor alphas of ESG index (0.82% monthly or 9.83% annually) is coming out to be positive and statistically significant. Out of different sectors of ESG index, financial sector is showing highest significant abnormal return of 1.69% per month (20.27% p.a.). It is interesting to mention here that although general companies (NIFTY index) are showing positive abnormal returns but alphais not significant if we employ Fama-French three factor model. This shows that market risk factor alone is sufficiently able to explain the excess return of general companies. However, in case of socially responsible companies, apart from market risk, size premium and value premium there could be some other factors which may affect

Table 6: Results of Fama-French Three Factor Model for Overall Period

Industries	Multi-Factor Alpha (%)	Market Risk Premium	Size Effect	Value Effect
ESG Index	0.819*** (0.000)	0.985*** (0.000)	0.155*** (0.002)	0.114*** (0.009)
NIFTY Index	0.085 (0.540)	0.882*** (0.000)	-0.126*** (0.001)	0.050 (0.109)
Sectors of ESG Index				
SR FMCG	0.785** (0.024)	0.755*** (0.000)	0.224** (0.014)	0.068 (0.381)
SR Financials	1.689*** (0.001)	1.001*** (0.000)	-0.356*** (0.005)	0.470*** (0.000)
SR Healthcare	0.179 (0.682)	0.932*** (0.000)	0.654*** (0.000)	-0.309*** (0.002)
SR Information Technology	1.023 (0.143)	1.353*** (0.000)	0.909*** (0.000)	-1.008*** (0.000)
SR Materials	0.704 (0.142)	0.937*** (0.000)	0.178 (0.153)	0.573*** (0.000)
SR Miscellaneous	0.901*** (0.004)	0.888*** (0.000)	-0.438*** (0.000)	0.531*** (0.000)

****significant at 1% **significant at 5% *significant at 10%*

the variation in excess returns. The beta values for size premium of ESG indexand different sectors of ESG index were significant (except of material sector). Size factor is generating positive slope in case of ESG index and their sectors (except of financial and miscellaneous) but negative for NIFTY index. It signifies that small cap companies are more able to determine the excess return in case of socially responsible companies and vice-a-versa is the case with general companies. Significant positive result for value premium in case of socially responsible companies (except of healthcare and IT) shows that high growth firms or firms having high book-to-market ratios are able to determine the excess return of the sectors.

CONCLUSIONS AND POLICY IMPLICATIONS

This paper answers an interesting question as to whether the socially responsible stocks across different sectors outperform index of socially responsible companies and general companies. It is found that socially responsible stocks of IT sector of ESG index generated significantly higher returns than other sectors of ESG index during the 18 year period, first 9 year and first 6 year period. However, during second 9 year and third 6 year periods, FMCG sector outperformed other sectors. These sectors outperformed both ESG and NIFTY index in terms of return and various risk-adjusted measures employed. The results of Fama's decomposition measure demonstrates that socially responsible stocks of IT and Financial sectors outperformed other sectors of ESG index even on the basis of net selectivity return during 18 year period and different sub-periods.The result of t-test shows that different sectors of ESG index produced significantly higher return than the return of NIFTY index. On the basis of benchmark indices of different sectors, only return of socially responsible stocks of Financial and IT sectors were significantly higher. Socially responsible stocks of IT sector generated the highest significant single factor alpha using market model. However, it is the financial sector that produced highest multi-factor alpha during the overall period. Thus, besides supplementing existing research, our results evidently describe that socially responsible stocksof IT, Financial and FMCG sectors are well rewarding in Indian stock market. Our results are more promising than the results of earlier studies (Hamilton *et al*., 1993; Luther & Matatko, 1994; Bauer *et al*., 2005).

Our findings support the view that giving due consideration to ESG issues will not serve as a penalty for investors as they do not have to sacrifice their returns. These findings have important implications for investors, companies, regulators, policy makers and mutual funds. Significant higher returns of ESG index and different sectors of ESG index make SRI a safer investment vehicle for investors in India. General companies should change their approach and agenda towards CSR and start considering ESG issues as their investment themes. The regulators, policy makers and mutual funds

should come up with different socially responsible products and sectoral indices to initiate the movement of SRI across different sectors in India.

However, the study is not free from limitations also. The study is entirely based on Indian market with consideration of only one socially responsible index and one general index. The further analysis could have been done by considering more socially responsible and general indices like GREENEX, CARBONEX and SENSEX.

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