

PERFORMANCE OF SOCIALLY RESPONSIBLE PORTFOLIOS – DO ECONOMIC CONDITIONS MATTER?

Vanita Tripathi*, Varun Bhandari**

Abstract *In a first of its kind, this paper examines the performance of various socially responsible stocks portfolios as compared to general stocks portfolios and market portfolio using return and various risk-adjusted measures over the period January 1996 – December 2013 and over different business economic conditions. Besides the conventional risk-adjusted measures, we have also used modified Sharpe ratio, double Sharpe ratio, M2 measure, alpha based on three factor Fama-French model and Fama's decomposition measure. Further we have checked for the impact of economic conditions (recession or boom) on the alpha and slope coefficients. We have also examined whether single factor CAPM is sufficient to explain cross sectional variations across portfolios or we need a multi-factor model (like Fama-French three factor model). We find that despite having higher risk, socially responsible stocks portfolios generated significantly higher returns and hence outperformed other portfolios on the basis of all risk-adjusted measures as well as net selectivity returns during both recession and boom periods. The results uphold even with the use of Fama-French three factor model for estimating excess returns. The empirical results, besides augmenting the existing literature on performance evaluation, clearly indicate that investors in India have become more socially conscious as the stock market is rewarding socially responsible companies well in terms of higher returns (on risk adjusted basis). The study supports the view that socially responsible investing is boon for investors in India. Therefore, regulators, policy makers and mutual funds should construct and make available various socially responsible investment products to initiate the movement of socially responsible investing in India.*

Keyword: *Socially Responsible Investing, ESG Index, GREENEX Index, Fama's Decomposition Measure, CAPM, Fama-French Three Factor Model*

INTRODUCTION

Growing awareness of environmental, social, governance and ethical issues is changing the perceptions and attitudes of today's investors. This development is fuelling retail and institutional investors' decisions towards socially responsible investing (SRI). The concept of SRI is not new to the world of finance but it has gained momentum in the last decade. Socially responsible investing (SRI) is an investment process that considers the social and environmental consequences of investments besides financial consequences, both positive and negative, within the rigorous framework of financial analysis. It can also be defined as a process of identifying and investing in a company that meets certain standards of corporate social responsibility and is increasingly practiced internationally.

SRI is attracting a lot of investor attention worldwide. According to US Social Investment Forum (SIF), approximately 10% of all US investments are managed according to some screening process related to environment,

social, ethical and governance issues. A socially responsible investor invests his money in stocks of socially responsible companies and penalises the stocks of other companies by not investing in them. In contrast to financial performance, socially responsible investors are also concerned about non-financial performance such as impact on environment, social and governance issues.

The Indian Companies Act, 2013 makes it mandatory for certain companies to undertake CSR activities. However, enforcement and effective implementation of such a law is still in doubt. Tripathi & Bhandari (2014) argued that socially responsible investing can bolster the CSR law and said that "Unless the investors turn socially responsible, CSR principles cannot be enforced in practice". They argue that if stock market rewards socially responsible stocks and penalises non-socially responsible stocks, then the CSR law will witness better and effective implementation.

This paper examines an interesting question – whether the portfolios of socially responsible companies outperform those of general companies in the Indian stock market

* Department of Commerce, Delhi School of Economics, University of Delhi, New Delhi, India.
E-mail:vanitatripathi1@yahoo.co.in

** Department of Commerce, Delhi School of Economics, University of Delhi, New Delhi, India.
E-mail:varunbhandari88@gmail.com

especially during identified boom and recessionary periods? This will help investors in knowing how SRI portfolios progressed in comparison with their general counterparts. The key objectives of this paper are:

1. To examine whether socially responsible stocks portfolio generated significantly higher returns than the general stocks portfolio and market portfolio.
2. To assess whether socially responsible stocks portfolio outperformed general stocks portfolio and market portfolio on the basis of various risk-adjusted measures.
3. To analyse the performance of different socially responsible and general stocks portfolio on the basis of net selectivity return.
4. To evaluate the impact of boom and recession on the returns of various portfolios using Modified Market Model and Fama-French Three Factor Model.

The remainder of this paper is organised as follows. The second section provides brief review of literature regarding comparing performance of socially responsible portfolios with general stocks portfolios. The 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 comparing performance of various SRI funds with that of conventional funds. Most of the research studies mostly pertained to USA, UK and Australia. To the best of our knowledge not much empirical work has been done so far in India especially in the context of boom and recessionary period.

Hamilton *et al.* (1993) found that socially responsible mutual funds did not earn statistically significant excess returns and that the performance of such mutual funds is not statistically different from the performance of conventional mutual funds. Thus, market does not price social responsibility characteristics.

Luther & Matatko (1994) attempted to determine whether performance of SRI funds outpaced the performance of 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 *et al.* (1997) established a two-factor CAPM (market risk and size premium) and find the underperformance of monthly returns of SRI funds compared with conventional funds 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.

Statman (2000) reported that Domini Social Index performed as well as the S&P 500 over the period 1990-98. He found no statistical significant difference in the returns of 31 SRI funds and 62 conventional funds. The returns of 31 SRI funds underperformed the S&P 500 by an average of 6.26% per annum. However, underperformance is statistically significant for three of 31 SRI funds.

Bauer *et al.* (2005) extended the work of Gregory *et al.* (1997) by using multi factor CAPM. They compared the risk-adjusted returns of 103 SRI funds from Germany, UK and USA with conventional funds for the period 1990-2001. The results evidenced that SRI funds from Germany and USA underperformed the market and conventional funds whereas UK SRI funds slightly outperformed the same benchmarks.

Kempf & Osthoff (2007) reported significant positive risk-adjusted returns for a US portfolio based on SRI during 1992-2004. Their portfolio was based on long-short strategy by investing in the 10% best SRI stocks within each industry and shorting the 10% worst SRI stocks in each industry.

Amenc & 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. However, Amenc & Sourd (2010) updated these results by considering the period of crisis. The results of global financial crisis revealed that SRI funds provided no protection from market downturns during this period as the risks of these funds were quite high.

Galema *et al.* (2008) tried to investigate the effect of SRI on stock returns. They found that SRI impacts the stock returns by lowering the book-to-market ratios and not by generating positive alphas. Jones *et al.* (2008) investigated the return performance of 89 ethical funds in Australia using multi-factor CAPM over the period 1986-2005. They found that ethical funds significantly underperform the market in Australia by 0.88% and 1.52% especially in the most recent 5 years (2000-05).

Mollet & 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.

Nofsinger & Varma (2012) compared the performance of socially responsible mutual funds with conventional funds over the period 2000-2011. They found that alphas for SRI and conventional funds are insignificantly negative and not different from each other. However, in non-crisis period,

conventional funds outperformed SRI funds by 0.67-0.95%. In crisis period, SRI funds outperformed by 1.61-1.70%.

Tripathi & 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 *et al.* (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 & Bhandari (2015a) 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 found that socially responsible stocks portfolio generated significantly higher returns as compared to other portfolios especially during crisis period. Tripathi & Bhandari (2015b) 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.

DATA AND METHODOLOGY

Data and Sources

The study evaluates three types of portfolios (viz. socially responsible stocks portfolio, general stocks portfolio and market portfolio) over the 18 year period from January 1996 – December 2013. Various proxies have been used to represent socially responsible stocks portfolio and general stocks portfolio. ESG Index, GREENEX Index, Socially Responsible Blue Chip (SRBC) stocks portfolio and Socially Responsible Non-Blue Chip (SRNBC) stocks portfolio have been used as the proxies for socially responsible stocks portfolios. General stocks portfolios comprise of the portfolios of large cap companies. Hence, NIFTY, SENSEX, Blue Chip Non-Socially Responsible (BCNSR) stocks portfolio and Mimicking stocks portfolio have been used as the proxy for general stocks portfolios as these portfolios include the largest companies in terms of market capitalisation. Theoretically, market portfolio comprises of all available stocks in the stock market. However, such a portfolio is very difficult to observe. Hence, we have used CNX 500 Equity Index as the proxy for market portfolio. ESG and GREENEX Indices are used to get the names of socially responsible companies. SRBC stocks portfolio comprises of those companies which are common in ESG Index and

NIFTY. However, SRNBC stocks portfolio includes those companies which are in ESG Index only but not in NIFTY and BCNSR stocks portfolio contains companies listed in NIFTY but not in ESG. Mimicking stocks portfolio is constructed by using the same sectoral composition as that of ESG Index but selecting 50 different companies on the basis of same size (in terms of market capitalisation). The calculations are done on the basis of stock price data of these companies. 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 $(P_t - P_{t-1}) / P_{t-1}$. Implicit yield on 91 days T-bills have been taken as a proxy for risk-free rate of return. Next we calculated Karl Pearson's coefficient of correlation among all these nine portfolios, 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 boom and recessionary periods as identified by Federal Reserve Bank of St. Louis. Different dates for boom and recession periods are given in Table 1.

Table 1: Booms and Recessions

Recessionary Periods	Boom Periods
January 1996 – October 1997	November 1997 – December 1999
January 2000 – January 2003	February 2003 – October 2007
November 2007 – March 2009	April 2009 – March 2011
April 2011 – December 2013	

Methodology

We in this paper are trying to use new methodology for assessing the performance of various portfolios during the above said periods. To accomplish our objectives, following hypotheses have been tested:

1. There is no significant difference in the returns of socially responsible stocks portfolio, general stocks portfolio and market portfolio.
2. Performance of socially responsible stocks portfolio is similar to the performance of general stocks portfolio and market portfolio using various risk adjusted measures.
3. There is no difference in the performance of socially responsible stocks portfolio and general stocks portfolio on the basis of net selectivity return.

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.

4. Boom and recession haveno impact on the returns of various portfolios using Modified Market Model and Fama-French Three Factor Model.

Risk Adjusted Measures for Performance Evaluation

1. **Sharpe Ratio:** This ratio measures the return of the portfolio (ARP) in excess of risk-free (RF), compared to total risk of the portfolio. Since it uses standard deviation as a measure of risk, it does not assume that the portfolio is well diversified.

$$\text{Sharpe ratio} = \frac{AR_p - R_F}{\sigma_p}$$

2. **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). This ratio is particularly relevant for evaluating the performance of well diversified portfolio, since it only takes systematic risk into account.

$$\text{Treynor ratio} = \frac{AR_p - R_F}{\beta_p}$$

3. **Modified Sharpe Ratio:** Israelsen (2005) argued that Sharpe ratio may lead to spurious ranking when excess returns of portfolios are negative. He proposed to correct this anomaly by modifying the standard Sharpe ratio by introducing an exponent to the denominator of Sharpe ratio. It can be calculated as:

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

4. **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. It can be calculated as:

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

where, $A(S_p)$ = Average of Sharpe Ratios

$\sigma(S_p)$ = Standard Deviation of Sharpe Ratios

5. **M² Measure:** Generally we compare the returns of portfolios with different levels of volatility (standard deviation). Modigliani & Modigliani (1997) showed that portfolio and its benchmark must have the same level of risk to be compared in terms of risk-adjusted performance. 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).

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

where, R_p^* = Return of Managed Portfolio

R_M = Return of Market Portfolio

6. **Jensen's 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:

$$\alpha = R_p - [R_F + (R_M - R_F) \beta_p]$$

7. **Multi Factor Alpha (Alpha Based on Fama-French Three Factor Model):** 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. It can be estimated as:

$$R_p - R_F = \alpha + \beta_1 (R_M - R_F) + \beta_2 (\text{SMB}) + \beta_3 (\text{HML})$$

where, α = Multi Factor Alpha

SMB = Small Minus Big (Size Effect)

HML = High Minus Low (Value Effect)

8. **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, α_p = Jensen's alpha or abnormal return of the portfolio

σ_{ep} = Unsystematic risk of the portfolio

9. **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:-

- Compensation for non-diversification (Systematic risk) = $\beta_p (R_M - R_F)$
- Compensation for diversification (Unsystematic risk) = $(R_M - R_F) [(\sigma_p / \sigma_M) - \beta_p]$
- Net selectivity = $(R_p - R_F) - (\sigma_p / \sigma_M) (R_M - R_F)$ = Selectivity – Compensation for unsystematic risk

T-Test

In order to check whether there is a significant difference between the returns of socially responsible stocks portfolios and general stocks portfolios, we have used t-test. In applying t-test we compare the returns for the whole period as well as for identified boom and recessionary periods.

$$t = \frac{\bar{x}_1 - \bar{x}_2}{\sqrt{\frac{s_1^2}{n_1} + \frac{s_2^2}{n_2}}}$$

where, x_1 and 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.

Dummy Variable Regression

To check if there is a significant difference in the alphas and slope (beta values) of different portfolios during the various identified boom and recessionary periods, we have estimated equation (1) in respect of all indices by introducing one dummy variable. One can see that equation (1) is a modified market model equation to capture the impact of business economic conditions i.e. boom and recession on various parameters i.e. alpha and slope.

$$R_p - R_F = \alpha_0 + \alpha_1 D + \beta_0 (R_M - R_F) + \beta_1 D (R_M - R_F) \quad (1)$$

where, R_p = Return of i^{th} Index

R_F = Risk-Free Rate of Return

R_M = Return of CNX 500 Equity Index

$D = 0$ for Recession and 1 for Boom

α_0 = Excess Return for Recession Period in respect of return of i^{th} Index

$\alpha_0 + \alpha_1$ = Excess Return for Boom Period in respect of return of i^{th} Index

β_0 = Slope or Beta of i^{th} Index return for Recession Period

$\beta_0 + \beta_1$ = Slope or Beta of i^{th} Index return for Boom Period

i covers all the four proxies of socially responsible stocks portfolios as well as general stocks portfolios.

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).

$$R_p - R_F = \alpha + \beta_1 (R_M - R_F) + \beta_2 (\text{SMB}) + \beta_3 (\text{HML}) \quad (2)$$

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 capitalization minus the equally weighted average returns of firms with the highest 30% market capitalization. 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.

Cusum Test

This test is based on the cumulative sum of the recursive residuals. The test checks stability/instability of parameters (beta values) by plotting the cumulative sum. If the cumulative sum goes outside the area between two critical lines, the parameters are said to be instable. We have employed Cusum test on Fama-French three factor model to check whether the parameters of the model have been stable or not over the 18 year period.

Fama-French Three Factor Model– Analysis for Boom and Recession

In order to check how these three factors viz. market risk premium, size premium and value premium behave during different business economic conditions, we have incorporated single dummy variable (D) to segregate boom and recession in equation (2).

$$R_p - R_F = \alpha_0 + \alpha_1 D + \beta_0 (R_M - R_F) + \beta_1 D (R_M - R_F) + \beta_2 \text{SMB} + \beta_3 D \cdot \text{SMB} + \beta_4 \text{HML} + \beta_5 D \cdot \text{HML} \quad (3)$$

where, $D = 0$ for Recession and 1 for Boom

α_0 = Excess Return for Recession Period

$\alpha_0 + \alpha_1$ = Excess Return for Boom Period

β_0 = Slope of Market Risk for Recession Period

$\beta_0 + \beta_1$ = Slope of Market Risk for Boom Period

β_2 = Slope of Size Effect for Recession Period

$\beta_2 + \beta_3$ = Slope of Size Effect for Boom Period

β_4 = Slope of Value Effect for Recession Period

$\beta_4 + \beta_5$ = Slope of Value Effect for Boom Period

Table 2: Correlation of Different Portfolios

Portfolios	NIFTY	SENSEX	ESG	GREENEX	MIMICKING	BCNSR	SRBC	SRNBC
CNX 500	0.964	0.956	0.938	0.911	0.864	0.923	0.949	0.859
NIFTY		0.988	0.902	0.914	0.804	0.933	0.968	0.792
SENSEX			0.893	0.916	0.785	0.925	0.967	0.779
ESG				0.919	0.924	0.907	0.927	0.971
GREENEX					0.841	0.926	0.921	0.847
MIMICKING						0.863	0.813	0.926
BCNSR							0.914	0.834
SRBC								0.812

Note: All bi-variate correlation coefficients are significant at 1%.

EMPIRICAL RESULTS

Table 2 shows the Karl Pearson's coefficient of correlation between different portfolios. It shows that SRNBC Stocks Portfolio has lowest degree of correlation with all other portfolios, especially with NIFTY and SENSEX. Hence, as per modern portfolio theory proposed by Markowitz (1953) which states that lower the coefficient of correlation, the greater is the benefit from diversification, the inclusion of these socially responsible non blue chip stocks portfolio can provide diversification benefits to the investors and help to reduce their portfolio risk.

Table 3 shows that socially responsible portfolios generated higher return than that of general stocks portfolio and market portfolio. SRNBC stocks portfolio generated the highest monthly average return of 2.51% and 4.78% during 18 year period and overall boom period. If we consider standard deviation (an absolute measure of risk), it shows that socially responsible portfolios are riskier than general portfolios and market portfolio. However, when we look at coefficient of variation (a relative measure of risk), we find that GREENEX had the least coefficient which demonstrates that it is the most shielding portfolio among all other portfolios. Higher beta for SRNBC stocks portfolio and ESG Index exhibits that these two portfolios are more sensitive to market conditions than NIFTY, SENSEX and other portfolios. When we decompose our total risk into two parts i.e. systematic and unsystematic risk, we find that socially responsible portfolios are the most risky portfolios among all other portfolios available. As we know that systematic risk cannot be eliminated with diversification since it is attributable to broad macro factors whereas unsystematic risk can be reduced to its minimum with the level of diversification.

During the entire study period of 18 years and different boom periods, socially responsible stocks portfolios outperformed general stocks portfolios and market portfolio in terms of various risk-adjusted measures. Higher risk in socially responsible stocks portfolios generated higher returns and as

a result higher Sharpe ratio, which indicates highest return per unit of total risk. GREENEX provided highest monthly return of 0.21% per unit of total risk as compared to 0.08% for NIFTY and SENSEX. Because of the negative excess return limitation of Sharpe ratio, results of Modified Sharpe ratio were also in favour of socially responsible stocks portfolios. Their values give no useful insight and should only be used as a ranking criterion (Israelsen, 2005). However, the results of Double Sharpe ratio were varied and indicate that socially responsible portfolios could be a safer bet for investors except for second boom period. M^2 measure determines that on creating portfolios with the same level of risk equivalent to market portfolio (CNX 500), all the proxies of socially responsible portfolios showed positive values which further describes that these proxies generated returns higher than that of market index and their general counterparts. Similarly, high Treynor ratio of socially responsible portfolios demonstrates highest return per unit of total systematic risk. Positive and significant high single factor Jensen's alpha signifies that socially responsible portfolios are generating highest abnormal returns. SRNBC portfolio generated the highest alpha of 1.10% and 1.25% during the whole period and overall boom period respectively. It is worth noting that only proxies of socially responsible portfolios are generating significantly higher abnormal returns using both single factor and multi-factor Jensen's alpha. It infers that apart from market risk premium, size premium and value premium there could be other factors which may affect the returns of socially responsible portfolios. Similarly, a high information ratio shows that an investor can achieve higher returns more efficiently by taking on additional risk. Similar results are obtained using specific boom periods (see Table 3).

Results of recessionary period also shows that socially responsible stocks portfolio outperformed the portfolios of general stocks and market portfolio in terms of return, coefficient of variation, Sharpe ratio, M^2 measure, Treynor ratio, alpha (single and multi-factor) and Information ratio. However, socially responsible stocks portfolios had highest amount of unsystematic risk in all the identified recessionary

Table 3: Monthly Return, Risk and Risk Adjusted Measures of Different Portfolios for 18 Year Period, Boom Periods and Recession Periods

PORTFOLIOS		BOOM PERIODS				RECESSION PERIODS				
	18 Year Period (Jan. 96 – Dec. 13)	Overall Boom Period	Nov. 97 – Dec. 99	Feb. 03 – Oct. 07	Apr. 09 – Mar. 11	Overall Recession Period	Jan. 96 – Oct. 97	Jan. 00 – Jan. 03	Nov. 07 – Mar. 09	Apr. 11 – Dec. 13
Average (%)										
CNX 500	1.314	3.225	2.418	3.561	3.302	-0.579	1.015	-0.900	-3.587	0.316
NIFTY	1.178	2.822	1.498	3.319	3.077	-0.436	1.094	-0.727	-3.329	0.360
SENSEX	1.170	2.898	1.409	3.432	3.244	-0.526	1.226	-0.937	-3.638	0.370
ESG	2.246	4.091	3.998	3.927	4.580	0.434	1.799	1.278	-2.979	0.337
GREENEX	2.311	4.063	3.446	4.378	3.985	0.592	2.259	0.463	-1.766	0.838
MIMICKING	1.859	4.412	4.728	4.083	4.853	-0.647	-0.052	-0.237	-2.712	-0.439
BCNSR	1.179	3.186	1.102	3.886	3.782	-0.791	0.647	-0.999	-3.548	-0.097
SRBC	1.924	3.317	2.720	3.390	3.791	0.557	2.103	0.856	-2.305	0.665
SRNBC	2.507	4.781	5.190	4.413	5.213	0.275	1.503	1.637	-3.474	-0.141
Std. Deviation (%)										
CNX 500	8.168	7.770	8.367	7.082	8.887	8.147	7.792	8.619	11.429	5.261
NIFTY	7.444	7.371	7.847	6.839	8.181	7.189	7.822	6.633	10.181	5.111
SENSEX	7.484	7.433	8.516	6.504	8.336	7.169	8.166	6.719	9.736	4.822
ESG	8.846	8.517	9.663	7.263	10.202	8.827	7.850	9.215	12.261	6.596
GREENEX	8.145	8.118	9.958	7.136	8.442	7.833	7.942	8.454	10.345	5.179
MIMICKING	10.413	10.258	10.583	9.547	11.863	9.989	8.445	9.845	14.935	8.165
BCNSR	8.489	8.382	7.932	7.462	10.647	8.161	8.282	7.488	12.386	5.830
SRBC	7.639	7.531	8.785	6.516	8.569	7.530	8.042	7.298	10.248	5.510
SRNBC	10.714	10.269	11.463	8.975	12.096	10.718	8.480	11.889	13.988	8.536
Coefficient of Variation										
CNX 500	6.215	2.409	3.461	1.989	2.691	-14.066	7.673	-9.572	-3.186	16.654
NIFTY	6.319	2.612	5.239	2.061	2.658	-16.480	7.152	-9.124	-3.058	14.191
SENSEX	6.394	2.565	6.043	1.895	2.569	-13.633	6.658	-7.173	-2.677	13.049
ESG	3.939	2.082	2.417	1.849	2.228	20.319	4.363	7.212	-4.116	19.544
GREENEX	3.524	1.998	2.890	1.630	2.118	13.241	3.514	18.248	-5.857	6.180
MIMICKING	5.600	2.325	2.238	2.338	2.444	-15.442	-163.21	-41.553	-5.506	-18.582
BCNSR	7.200	2.631	7.198	1.920	2.815	-10.313	12.794	-7.490	-3.491	-60.280
SRBC	3.969	2.270	3.230	1.922	2.260	13.517	3.823	8.529	-4.446	8.280
SRNBC	4.273	2.148	2.209	2.034	2.320	39.030	5.642	7.260	-4.027	-60.386
Beta										
CNX 500	1	1	1	1	1	1	1	1	1	1
NIFTY	0.880	0.913	0.887	0.931	0.903	0.853	0.988	0.724	0.882	0.960
SENSEX	0.878	0.913	0.957	0.877	0.916	0.844	1.038	0.726	0.836	0.895
ESG	1.018	1.028	1.070	0.941	1.135	1.015	0.924	0.966	1.059	1.222
GREENEX	0.911	0.951	1.047	0.923	0.906	0.874	0.907	0.830	0.888	0.953
MIMICKING	1.104	1.127	0.903	1.169	1.300	1.058	0.891	0.892	1.261	1.445
BCNSR	0.962	1.005	0.817	0.993	1.184	0.913	1.047	0.692	1.053	1.071
SRBC	0.889	0.930	1.010	0.895	0.924	0.871	1.011	0.759	0.870	1.031
SRNBC	1.129	1.113	1.115	0.992	1.321	1.138	0.853	1.137	1.179	1.509
Systematic Risk (%)										
CNX 500	8.168	7.770	8.367	7.082	8.887	8.147	7.792	8.619	11.429	5.261
NIFTY	7.188	7.094	7.421	6.594	8.025	6.949	7.699	6.240	10.080	5.050

SENSEX	7.172	7.094	8.007	6.211	8.140	6.876	8.088	6.257	9.555	4.708
ESG	8.315	7.987	8.952	6.664	10.087	8.269	7.200	8.326	12.103	6.428
GREENEX	7.441	7.389	8.760	6.537	8.052	7.120	7.067	7.154	10.149	5.013
MIMICKING	9.018	8.756	7.555	8.279	11.553	8.619	6.943	7.688	14.412	7.601
BCNSR	7.858	7.808	6.836	7.033	10.522	7.438	8.158	5.964	12.035	5.634
SRBC	7.261	7.226	8.450	6.339	8.211	7.096	7.878	6.542	9.943	5.424
SRNBC	9.222	8.648	9.329	7.026	11.740	9.271	6.647	9.799	13.475	7.938
Unsystematic Risk (%)										
CNX 500	0	0	0	0	0	0	0	0	0	0
NIFTY	1.934	2.002	2.550	1.815	1.588	1.840	1.385	2.250	1.430	0.786
SENSEX	2.138	2.221	2.900	1.930	1.794	2.030	1.122	2.449	1.870	1.041
ESG	3.019	2.958	3.637	2.887	1.528	3.088	3.129	3.949	1.958	1.477
GREENEX	3.311	3.363	4.736	2.863	2.537	3.264	3.622	4.505	2.003	1.300
MIMICKING	5.207	5.344	7.412	4.753	2.695	5.049	4.808	6.149	3.917	2.980
BCNSR	3.213	3.047	4.024	2.493	1.625	3.359	1.427	4.527	2.928	1.500
SRBC	2.370	2.121	2.401	1.512	2.451	2.518	1.614	3.235	2.481	0.972
SRNBC	5.454	5.537	6.661	5.584	2.913	5.379	5.266	6.731	3.754	3.139
Sharpe Ratio										
CNX 500	0.0881	0.3488	0.2042	0.4362	0.3256	-0.1536	0.0325	-0.1765	-0.3658	-0.0751
NIFTY	0.0783	0.3129	0.1005	0.4162	0.3262	-0.1542	0.0424	-0.2033	-0.3853	-0.0686
SENSEX	0.0769	0.3206	0.0822	0.4551	0.3402	-0.1672	0.0568	-0.2319	-0.4346	-0.0708
ESG	0.1866	0.4198	0.3403	0.4757	0.4088	-0.0270	0.1321	0.0712	-0.2914	-0.0566
GREENEX	0.2107	0.4370	0.2748	0.5473	0.4236	-0.0103	0.1885	-0.0187	-0.2281	0.0246
MIMICKING	0.1214	0.3799	0.3797	0.3782	0.3746	-0.1321	-0.0964	-0.0872	-0.2214	-0.1409
BCNSR	0.0688	0.3186	0.0495	0.4576	0.3168	-0.1794	-0.0139	-0.2165	-0.3344	-0.1385
SRBC	0.1740	0.3720	0.2289	0.4478	0.3947	-0.0153	0.1668	0.0321	-0.2828	-0.0082
SRNBC	0.1785	0.4154	0.3909	0.4391	0.3972	-0.0371	0.0873	0.0855	-0.2908	-0.0998
Modified Sharpe Ratio										
CNX 500	0.0881	0.3488	0.2042	0.4362	0.3256	-0.0010	0.0325	-0.0013	-0.0048	-0.0002
NIFTY	0.0783	0.3129	0.1005	0.4162	0.3262	-0.0008	0.0424	-0.0009	-0.0040	-0.0002
SENSEX	0.0769	0.3206	0.0822	0.4551	0.3402	-0.0009	0.0569	-0.0010	-0.0041	-0.0002
ESG	0.1866	0.4198	0.3403	0.4757	0.4088	-0.0002	0.1321	0.0712	-0.0044	-0.0002
GREENEX	0.2107	0.4370	0.2748	0.5473	0.4236	-0.0001	0.1885	-0.0001	-0.0024	0.0246
MIMICKING	0.1214	0.3799	0.3797	0.3782	0.3746	-0.0013	-0.0007	-0.0008	-0.0049	-0.0009
BCNSR	0.0688	0.3186	0.0495	0.4576	0.3168	-0.0012	-0.0001	-0.0012	-0.0051	-0.0005
SRBC	0.1740	0.3720	0.2289	0.4478	0.3947	-0.0001	0.1668	0.0321	-0.0030	-0.000025
SRNBC	0.1785	0.4154	0.3909	0.4391	0.3972	-0.0004	0.0873	0.0855	-0.0057	-0.0007
Double Sharpe Ratio										
CNX 500	0.0873	0.3482	0.2049	0.4360	0.3240	-0.1537	0.0273	-0.1762	-0.3649	-0.0749
NIFTY	0.0781	0.3124	0.1008	0.4165	0.3248	-0.1542	0.0424	-0.2028	-0.3842	-0.0685
SENSEX	0.0766	0.3199	0.0824	0.4552	0.3386	-0.1672	0.0569	-0.2311	-0.4333	-0.0707
ESG	0.0861	0.3152	0.0903	0.3769	0.3818	-0.1318	-0.0327	-0.0643	-0.3093	-0.1322
GREENEX	0.1306	0.3230	0.1166	0.4025	0.3359	-0.0712	0.1559	-0.1622	-0.2441	-0.0099
MIMICKING	-0.0500	0.1936	0.0978	0.1789	0.3038	-0.2783	-0.2835	-0.2392	-0.3990	-0.2363
BCNSR	0.0153	0.2589	-0.0224	0.3642	0.2780	-0.2265	-0.1491	-0.2587	-0.3734	-0.1639
SRBC	0.1283	0.3091	0.0406	0.4189	0.3216	-0.0596	0.1280	-0.0558	-0.3094	-0.0565
SRNBC	0.0428	0.2927	0.1571	0.3023	0.3786	-0.1765	-0.1486	-0.0858	-0.2992	-0.1925
Treynor Ratio										
CNX 500	0.0072	0.0271	0.0171	0.0309	0.0289	-0.6861	0.0025	-0.0152	-0.0418	-0.0039
NIFTY	0.0066	0.0253	0.0089	0.0306	0.0296	-0.8026	0.0033	-0.0186	-0.0445	-0.0037
SENSEX	0.0066	0.0261	0.0073	0.0338	0.0310	-0.8122	0.0045	-0.0215	-0.0506	-0.0038
ESG	0.0162	0.0348	0.0307	0.0367	0.0367	-0.6659	0.0112	0.0068	-0.0337	-0.0031
GREENEX	0.0188	0.0373	0.0261	0.0423	0.0395	-0.7716	0.0165	-0.0019	-0.0266	0.0013
MIMICKING	0.0115	0.0346	0.0445	0.0309	0.0342	-0.6491	-0.0091	-0.0096	-0.0262	-0.0080
BCNSR	0.0061	0.0266	0.0048	0.0344	0.0285	-0.7538	-0.0011	-0.0234	-0.0393	-0.0075

SRBC	0.0150	0.0301	0.0199	0.0326	0.0366	-0.7746	0.0133	0.0031	-0.0333	-0.0004
SRNBC	0.0169	0.0383	0.0402	0.0397	0.0364	-0.5954	0.0087	0.0089	-0.0345	-0.0056
M² Measure										
CNX 500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NIFTY	-0.0796	-0.2783	-0.8676	-0.1411	0.0053	-0.0048	0.0769	-0.2302	-0.2224	0.0340
SENSEX	-0.0911	-0.2190	-1.0208	0.1340	0.1294	-0.1101	0.1898	-0.4768	-0.7860	0.0226
ESG	0.8049	0.5516	1.1388	0.2801	0.7397	1.0319	0.7759	2.1356	0.8510	0.0972
GREENEX	1.0020	0.6856	0.5906	0.7870	0.8710	1.1675	1.2160	1.3606	1.5739	0.5241
MIMICKING	0.2725	0.2417	1.4685	-0.4105	0.4357	0.1757	-1.0043	0.7704	1.6512	-0.3461
BCNSR	-0.1572	-0.2340	-1.2943	0.1516	-0.0780	-0.2096	-0.3614	-0.3441	0.3590	-0.3337
SRBC	0.7023	0.1808	0.2063	0.0822	0.6140	1.1267	1.0464	1.7985	0.9486	0.3517
SRNBC	0.7384	0.5178	1.5621	0.0207	0.6359	0.9493	0.4273	2.2584	0.8578	-0.1302
Single Factor Jensen's Alpha (%)										
CNX 500	0	0	0	0	0	0	0	0	0	0
NIFTY	-0.0451	-0.1691	-0.7265	-0.0269	0.0574	-0.0457	0.1265	-0.2459	-0.2332	0.0284
SENSEX	-0.0512	-0.0935	-0.9358	0.2526	0.1858	-0.1464	0.2489	-0.4514	-0.7319	0.0122
ESG	0.9242***	0.7885***	1.4586*	0.5447	0.8848**	1.0285***	0.8446	2.1270***	0.8523*	0.1083
GREENEX	1.0663***	0.9686***	0.9480	1.0517**	0.9522*	1.0088***	1.3096	1.1067	1.3551**	0.5030**
MIMICKING	0.4759	0.8404	2.4769	-0.0076	0.6813	0.0014	-0.9994	0.5039	1.9569*	-0.5805
BCNSR	-0.1026	-0.0566	-1.0019	0.3459	-0.0514	-0.3249	-0.3319	-0.5653	0.2625	-0.3848
SRBC	0.6948***	0.2818	0.2846	0.1819	0.7050	0.9708***	1.1312**	1.3889**	0.7404	0.3614**
SRNBC	1.1058***	1.2469**	2.5743*	0.8674	0.9799	1.0225*	0.5629	2.7467**	0.8583	-0.2580
Multi Factor Jensen's Alpha (%)										
CNX 500	0	0	0	0	0	0	0	0	0	0
NIFTY	0.0848	0.0707	0.1123	-0.0283	-0.0437	0.0029	0.0464	-0.2316	-0.1832	0.0329
SENSEX	0.0883	0.2032	0.1114	0.2757	0.2203	-0.1170	-0.0161	-0.4481	-0.6499	-0.0263
ESG	0.8198***	0.4352*	1.0226	0.2622	0.9896**	1.1743***	2.5880***	1.5606***	0.9135*	0.5409**
GREENEX	1.1139***	1.1504***	1.3758	1.1661***	0.8973*	1.0655***	1.1124	0.4623	1.6353***	0.5795**
MIMICKING	0.1054	0.1316	1.4712	-0.5852	0.5807	0.1570	1.8982**	-0.6179	1.8052***	-0.0771
BCNSR	0.0654	0.4406	0.1889	0.5452	-0.1537	-0.2739	0.6059	-0.8869	0.3816	-0.2972
SRBC	0.8932***	0.4556**	0.8141	0.2285	0.8210	1.1162***	1.1754*	1.4569***	0.6415	0.5853***
SRNBC	0.7461**	0.4070	1.2791	0.2727	1.0459*	1.1973***	3.4810***	1.6325**	1.0651	0.4423
Information Ratio										
CNX 500	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
NIFTY	-0.0258	-0.0836	-0.2850	-0.0161	0.0350	-0.0223	0.0586	-0.1096	-0.1644	0.0362
SENSEX	-0.0262	-0.0410	-0.3225	0.1300	0.1031	-0.0699	0.1794	-0.1851	-0.3935	0.0117
ESG	0.3042	0.2669	0.4015	0.1899	0.5802	0.3344	0.2566	0.5384	0.4368	0.0740
GREENEX	0.3204	0.2886	0.2001	0.3683	0.3762	0.3103	0.3499	0.2453	0.6754	0.3874
MIMICKING	0.0903	0.1577	0.3341	-0.0001	0.2533	0.0010	-0.2162	0.0811	0.5020	-0.1945
BCNSR	-0.0335	-0.0172	-0.2493	0.1391	-0.0325	-0.0956	-0.2664	-0.1254	0.0890	-0.2563
SRBC	0.2911	0.1327	0.1187	0.1013	0.2892	0.3871	0.6723	0.4295	0.2978	0.3722
SRNBC	0.2017	0.2257	0.3867	0.1569	0.3369	0.1909	0.0996	0.4079	0.2297	-0.0816

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

periods which implies that these portfolios are not well diversified. Similarly, systematic risk of these portfolios is also higher than the general stocks portfolios. This implies that socially responsible stocks are riskier than general companies stocks in the Indian stock market. But at the same time return was also higher than general stocks portfolios. The significant alpha value of ESG Index during overall recession period indicates that average monthly excess

return is around 1.03%. However, after introducing for size and value factors, the three factor alpha is even higher suggesting monthly outperformance of SRNBC portfolio of around 1.20% during overall recession period followed by ESG Index (1.17% per month). Thus, there is absolutely no penalty if investors invest in socially responsible stocks because these stocks had even provided better results in the various recessionary periods.

Table 4 displays the results of Fama's Decomposition Measure. Here also, socially responsible stocks portfolios generated the highest risk premiums among all other portfolios. It must be noted that socially responsible portfolios provided much higher compensation for non-diversification to the investors as compared to other portfolios. During the total study period, SRNBC portfolio provided 0.13% per month as compensation for unsystematic risk as against 0.02% in case of NIFTY and 0.03% for SENSEX. Moreover, only socially responsible portfolios produced highest compensation for non-diversification during overall boom and different boom periods because of the fact that socially responsible stocks portfolios are less diversified as compared

to their general stocks counterparts. This may be due to the reason that majority of socially responsible stocks portfolio comprises of companies from IT and banking. However, the more interesting point to note here is that all the socially responsible portfolios provided positive net selectivity returns in the whole period as well as in all the boom periods. Thus, socially responsible portfolios outperformed their general counterparts even on net selectivity basis. This indicates that compromise with respect to diversification made by investors by investing in socially responsible portfolios, was well rewarded in terms of higher returns. Results are consistent as all the socially responsible stocks portfolios provided positive net selectivity returns even in the identified recessionary periods. Thus, it proves that

Table 4: Results of Fama's Decomposition (Boom and Recession Analysis)

Portfolios	Risk Premium (%)	Risk Premium due to (%)				Ranking on the basis of
18 Year Period		Systematic Risk	Selectivity	Unsystematic Risk	Net Selectivity	Net Selectivity
NIFTY	0.583	0.633	-0.050	0.022	-0.073	6
SENSEX	0.576	0.632	-0.056	0.027	-0.083	7
ESG	1.651	0.732	0.918	0.047	0.872	3
GREENEX	1.717	0.655	1.061	0.062	0.999	1
MIMICKING	1.265	0.794	0.470	0.123	0.347	5
BCNSR	0.584	0.692	-0.108	0.056	-0.163	8
SRBC	1.329	0.640	0.689	0.033	0.656	4
SRNBC	1.912	0.812	1.100	0.131	0.969	2
Overall Boom Period						
NIFTY	2.307	2.474	-0.167	0.097	-0.264	8
SENSEX	2.383	2.474	-0.091	0.118	-0.210	6
ESG	3.575	2.786	0.790	0.185	0.605	3
GREENEX	3.548	2.577	0.971	0.254	0.716	1
MIMICKING	3.897	3.054	0.843	0.524	0.319	4
BCNSR	2.671	2.723	-0.052	0.200	-0.252	7
SRBC	2.802	2.520	0.282	0.106	0.175	5
SRNBC	4.266	3.016	1.250	0.565	0.684	2
Boom Period (Nov. 1997 – Dec. 1999)						
NIFTY	0.789	1.516	-0.727	0.087	-0.814	6
SENSEX	0.700	1.635	-0.935	0.104	-1.039	7
ESG	3.289	1.828	1.460	0.145	1.315	3
GREENEX	2.737	1.789	0.948	0.245	0.703	4
MIMICKING	4.019	1.543	2.476	0.618	1.858	2
BCNSR	0.393	1.396	-1.003	0.224	-1.227	8
SRBC	2.011	1.726	0.285	0.068	0.217	5
SRNBC	4.481	1.905	2.576	0.436	2.140	1
Boom Period (Feb. 2003 – Oct. 2007)						
NIFTY	2.847	2.876	-0.029	0.107	-0.136	7
SENSEX	2.960	2.709	0.251	0.128	0.123	4

ESG	3.455	2.907	0.548	0.261	0.287	2
GREENEX	3.906	2.851	1.054	0.261	0.793	1
MIMICKING	3.610	3.611	-0.001	0.553	-0.553	8
BCNSR	3.414	3.067	0.347	0.187	0.160	3
SRBC	2.918	2.765	0.153	0.078	0.076	5
SRNBC	3.941	3.064	0.876	0.850	0.026	6
Boom Period (Apr. 2009 – Mar. 2011)						
NIFTY	2.669	2.613	0.056	0.051	0.005	7
SENSEX	2.836	2.651	0.185	0.064	0.121	6
ESG	4.171	3.284	0.887	0.037	0.849	2
GREENEX	3.576	2.622	0.955	0.127	0.827	3
MIMICKING	4.444	3.762	0.683	0.101	0.582	5
BCNSR	3.373	3.426	-0.053	0.041	-0.093	8
SRBC	3.382	2.674	0.709	0.117	0.592	4
SRNBC	4.804	3.822	0.982	0.116	0.866	1
Overall Recession Period						
NIFTY	-1.109	-1.068	-0.041	-0.0368	-0.004	6
SENSEX	-1.198	-1.056	-0.142	-0.0451	-0.097	7
ESG	-0.238	-1.271	1.032	-0.0857	1.118	3
GREENEX	-0.081	-1.094	1.013	-0.1095	1.123	2
MIMICKING	-1.319	-1.324	0.005	-0.2105	0.215	5
BCNSR	-1.464	-1.143	-0.321	-0.1111	-0.210	8
SRBC	-0.116	-1.090	0.975	-0.0666	1.041	4
SRNBC	-0.398	-1.425	1.027	-0.2224	1.249	1
Recession Period (Jan. 1996 – Oct. 19 97)						
NIFTY	0.331	0.250	0.081	0.0040	0.077	6
SENSEX	0.464	0.263	0.201	0.0025	0.199	5
ESG	1.037	0.234	0.803	0.0211	0.782	3
GREENEX	1.497	0.230	1.268	0.0284	1.239	1
MIMICKING	-0.814	0.226	-1.040	0.0488	-1.088	8
BCNSR	-0.115	0.265	-0.380	0.0040	-0.384	7
SRBC	1.341	0.256	1.085	0.0053	1.080	2
SRNBC	0.741	0.216	0.525	0.0596	0.465	4
Recession Period (Jan. 2000 – Jan. 2003)						
NIFTY	-1.348	-1.102	-0.247	-0.0694	-0.177	6
SENSEX	-1.558	-1.105	-0.453	-0.0816	-0.372	8
ESG	0.656	-1.470	2.126	-0.1570	2.283	2
GREENEX	-0.158	-1.263	1.105	-0.2296	1.335	4
MIMICKING	-0.858	-1.357	0.499	-0.3808	0.880	5
BCNSR	-1.621	-1.053	-0.568	-0.2690	-0.299	7
SRBC	0.234	-1.155	1.389	-0.1335	1.523	3
SRNBC	1.016	-1.730	2.746	-0.3689	3.115	1
Recession Period (Nov. 2007 – Mar. 2009)						
NIFTY	-3.923	-3.688	-0.235	-0.0369	-0.198	7
SENSEX	-4.231	-3.496	-0.736	-0.0663	-0.670	8
ESG	-3.573	-4.428	0.855	-0.0576	0.913	4
GREENEX	-2.360	-3.713	1.353	-0.0716	1.425	2

MIMICKING	-3.306	-5.273	1.966	-0.1913	2.158	1
BCNSR	-4.142	-4.403	0.261	-0.1285	0.389	6
SRBC	-2.899	-3.638	0.739	-0.1115	0.851	5
SRNBC	-4.068	-4.930	0.862	-0.1877	1.050	3
Recession Period (Apr. 2011 – Dec. 2013)						
NIFTY	-0.351	-0.379	0.028	-0.0046	0.033	4
SENSEX	-0.341	-0.353	0.012	-0.0085	0.021	5
ESG	-0.373	-0.483	0.109	-0.0126	0.122	3
GREENEX	0.127	-0.376	0.504	-0.0124	0.516	1
MIMICKING	-1.150	-0.571	-0.580	-0.0423	-0.537	8
BCNSR	-0.808	-0.423	-0.385	-0.0147	-0.370	7
SRBC	-0.045	-0.407	0.362	-0.0065	0.368	2
SRNBC	-0.852	-0.596	-0.256	-0.0449	-0.211	6

socially responsible stocks portfolios can be used to build up defensive and better performing portfolios by socially responsible investors in India.

In Table 5 we have compared the different pairs of socially responsible portfolios with general portfolios and market portfolio. Over the total study period, all the portfolios of socially responsible companies generated significantly higher return than those of general companies' portfolio and market portfolio. However, difference between the returns of socially responsible portfolios (except SRNBC) and mimicking portfolio is not statistically significant.

Even in the overall boom and various identified boom periods, socially responsible companies provided significantly higher returns than other portfolios. During overall boom period, the return of SRNBC portfolio was higher by 1.96% per month (p-value < 0.01) than the return of NIFTY. During overall recession and different recessionary periods as well, the results were promising because portfolios of socially

responsible companies again provided higher returns than the portfolio of general companies and market portfolio and the difference was statistically significant. GREENEX provided return higher by 1.16% per month (p-value < 0.01) than the return of CNX 500 Equity Index. This shows greater concern for environment by investors in India. Hence, socially responsible portfolios are continuously beating the market and other portfolios in the Indian stock market by generating significantly higher returns. Thus, investors are well rewarded for being socially responsible (in terms of higher returns) in Indian stock market.

Table 6 shows the results for dummy variable regression model to check the impact of business cycles (Boom and Recession) on the parameters of market model. Alpha values of all the socially responsible stocks portfolios were positive and significant during recession periods. ESG Index is generating highest excess return of 1.03% per month. However, alphavalues for all the portfolios of general companies were negative and insignificant during the said

Table 5: Comparative Performance: Result of t-test (Comparing Mean Returns)

Pairs	18 Year Period	Boom Period				Recession Period				
		Overall Boom Period	First Boom Period	Second Boom Period	Third Boom Period	Overall Recession Period	First Recession Period	Second Recession Period	Third Recession Period	Fourth Recession Period
ESG – CNX 500	0.937***	0.865***	1.580**	0.366	1.277***	1.008***	0.830	2.178***	0.609	0.022
ESG – NIFTY	1.068***	1.268***	2.499**	0.608	1.502**	0.871**	0.705	2.005**	0.350	-0.023
ESG – SENSEX	1.075***	1.192***	2.588**	0.495	1.335*	0.960**	0.572	2.214***	0.659	-0.032
ESG – MIMICKING	0.386	-0.322	-0.730	-0.155	-0.273	1.081***	1.851***	1.514**	-0.266	0.777*
ESG – BCNSR	1.066***	0.904**	2.896***	0.041	0.797*	1.226***	1.152*	2.277***	0.569	0.434
GREENEX – CNX 500	1.003***	0.838**	1.028	0.816**	0.682	1.165***	1.290	1.364*	1.821***	0.522**

GREENEX – NIFTY	1.133***	1.241***	1.948*	1.059***	0.907*	1.028***	1.166	1.190*	1.563***	0.478*
GREENEX – SENSEX	1.141***	1.165***	2.037**	0.946***	0.741	1.117***	1.033	1.400*	1.871***	0.468
GREENEX - MIMICKING	0.452	-0.349	-1.282	0.295	-0.868	1.238***	2.311*	0.700	0.946	1.277*
GREENEX – BCNSR	1.132***	0.877***	2.344***	0.491	0.203	1.383***	1.612*	1.463**	1.782**	0.935***
SRBC – CNX 500	0.616***	0.092	0.302	-0.171	0.489	1.131***	1.134	1.756***	1.282*	0.349*
SRBC – NIFTY	0.746***	0.495***	1.222***	0.071	0.714	0.993***	1.009**	1.583***	1.024**	0.305
SRBC – SENSEX	0.754***	0.419**	1.310***	-0.042	0.547	1.083***	0.877***	1.792***	1.333**	0.296
SRBC – MIMICKING	0.065	-1.095*	-2.008	-0.692	-1.062	1.204**	2.155*	1.093	0.407	1.105*
SRBC – BCNSR	0.745***	0.131	1.618**	-0.496	0.009	1.348***	1.456**	1.855**	1.243	0.762**
SRNBC – CNX 500	1.199***	1.556***	2.772**	0.852	1.910**	0.848	0.533	2.538**	0.114	-0.457
SRNBC – NIFTY	1.329***	1.959***	3.692**	1.094	2.135*	0.711	0.409	2.364*	-0.145	-0.501
SRNBC – SENSEX	1.336***	1.883***	3.781**	0.981	1.968	0.800	0.276	2.574*	0.164	-0.511
SRNBC – MIMICKING	0.648**	0.369	0.462	0.330	0.359	0.921**	1.555**	1.874**	-0.761	0.298
SRNBC – BCNSR	1.328***	1.595***	4.088**	0.526	1.431*	1.066*	0.855	2.637**	0.075	-0.045

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

period because security prices of general companies had fallen severely. None of the portfolio is generating significant alpha value during boom period (except SRBC). This signifies that apart from market risk premium there could be some other factors in determining the portfolio return in case of socially responsible companies during recessionary period. It is interesting to mention here that all the socially responsible portfolios are producing positive excess returns in both the periods which denotes that irrespective of business economic conditions i.e. boom or recession, there is heavy demand for stocks of socially responsible companies, pushing their prices up in case of boom and recession and hence providing higher return accordingly and showing positive excess returns.

In recession period, as per modern portfolio theory, the slope is significant for all the eight portfolios. It is the SRNBC stocks portfolio that generated highest significant slope of 1.140. Further in boom period, differential slope is significant for all the three general stocks portfolios (NIFTY, SENSEX and BCNSR) only. It is clearly evident from Table

6 that all other portfolios are giving positive but insignificant differential slope (except SRNBC) during boom period. Thus, boom has a significant positive impact on return of these portfolios. However, it is quite surprising that market factor is not significantly able to explain the portfolio return in case of boom period. During adversity i.e. recession, investors put more faith on socially responsible companies and as a result, impact of recession has been highly positive in case of socially responsible companies.

Table 7 discusses the result of Fama-French three factor model. In Table 3 we reported that abnormal returns (Jensen's alpha) of all the socially responsible portfolios were statistically significant by employing market model. 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 portfolios. The results of Fama-French three factor model shows that after controlling for market risk, size premium and value premium, multi-factor alphas of all the socially responsible portfolios is coming out to be positive and statistically significant. GREENEX

Table6: Alpha and Slope using Market Model in Boom and Recession Periods

Portfolios	Recession Period		Boom Period	
	Alpha (α_0)	Slope (β_0)	Alpha ($\alpha_0 + \alpha_1$)	Slope ($\beta_0 + \beta_1$)
NIFTY	-0.00046	0.853***	-0.00169	0.914*
SENSEX	-0.00146	0.844***	-0.00093	0.914*
ESG	0.01028***	1.016***	0.00788	1.028
GREENEX	0.01009***	0.874***	0.00968	0.951
MIMICKING	0.00001	1.060***	0.00840	1.128
BCNSR	-0.00325	0.914***	-0.00057	1.007*
SRBC	0.00971***	0.872***	0.00282**	0.930
SRNBC	0.01023*	1.140***	0.01247	1.114

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

is showing highest significant abnormal return of 1.11% per month. It is interesting to note here that although all the portfolios of general stocks are showing positive abnormal returns but none of the alphas were statistically significant if we employ Fama-French three factor model. The beta values for size premium of different portfolios were significant (except of GREENEX). Significant positive result for value premium (except of NIFTY and SENSEX) shows that high growth firms or firms having high book-to-market ratios are able to determine the excess return of the portfolios.

Figure 1 displays the results of Cusum test used to check for the stability of the parameters (beta values) of Fama-French three factor model. It is evident from the figures that cumulative sum of all the recursive residuals are within the 5% critical lines, hence, parameters of all the portfolios/

indices are said to be stable enough for our sample period i.e. 18 years. It suggests that during this period, beta values of different portfolios do not fluctuate significantly.

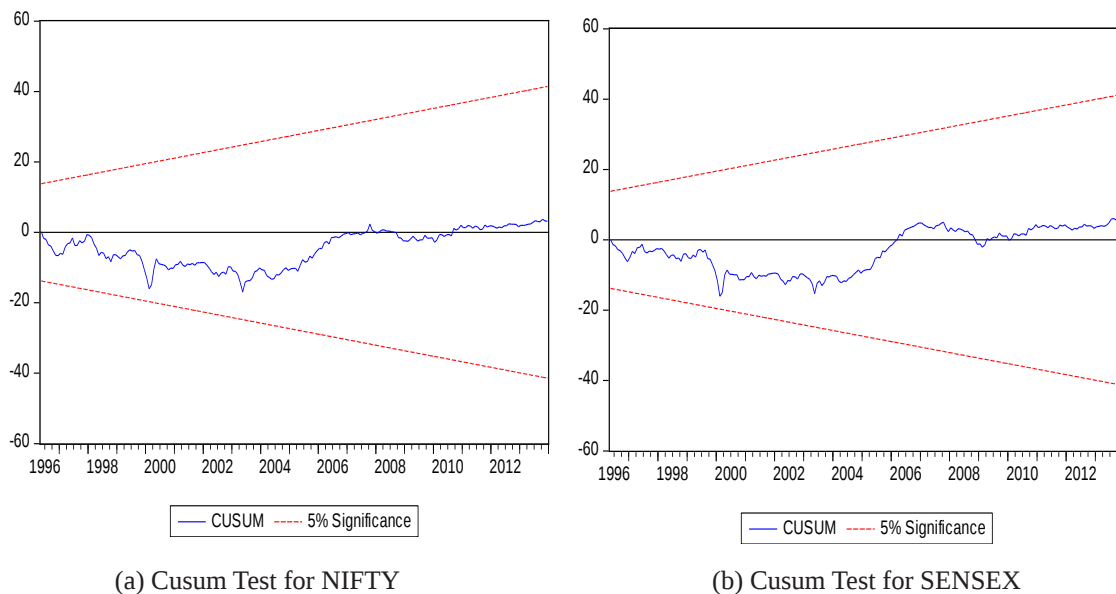
Table 8 demonstrates that even with the use of three factor asset pricing model, socially responsible stocks portfolios (especially ESG and SRNBC) produce statistically significant positive excess returns (or alphas) whereas portfolios of general companies did not. The results are similar in recession and boom periods. A closer look at the results also reveals that market is a significant factor in explaining cross sectional variations in recession periods (and not in boom periods). On the other hand, during boom period, size and value factors outweigh the market factor. These results are contradictory to the existing literature which evidenced the supremacy of market factor in explaining cross sectional variations in returns.

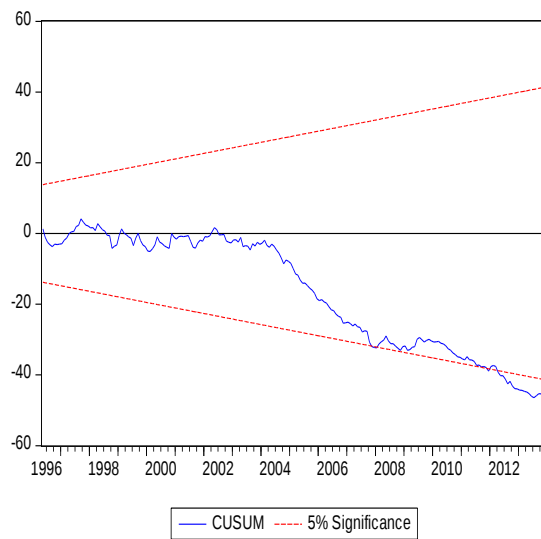
Table 7: Results of Fama-French Three Factor Model for 18 Year Period

Portfolios/Indices (Equation 2)	Multi Factor Alpha (α)	Market Risk Premium (β_1)	Size Effect (β_2)	Value Effect (β_3)
NIFTY	0.000848	0.882***	-0.126***	0.050
SENSEX	0.000883	0.881***	-0.138***	0.047
ESG	0.008198***	0.985***	0.155***	0.114***
GREENEX	0.011139***	0.895***	-0.019	0.097*
MIMICKING	0.001054	1.038***	0.468***	0.167***
BCNSR	0.000654	0.933***	-0.111*	0.214***
SRBC	0.008932***	0.885***	-0.182***	0.106***
SRNBC	0.007461**	1.070***	0.446***	0.137**

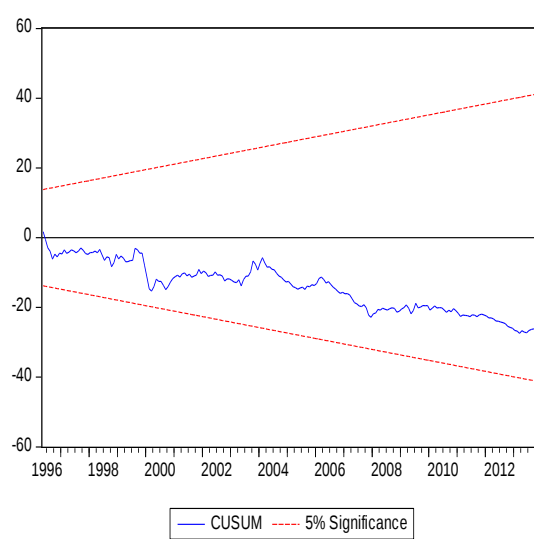
***significant at 1% **significant at 5% *significant at 10%

Figure 1: Results of Cusum Test

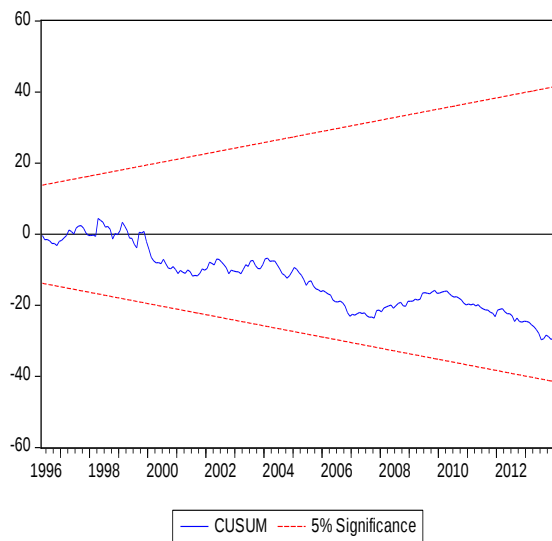




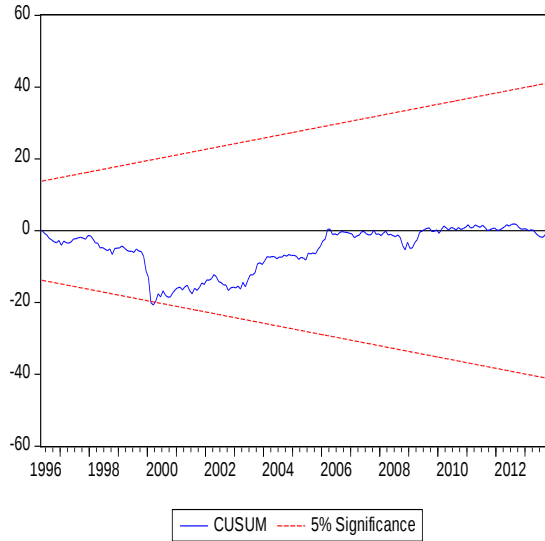
(c) Cusum Test for ESG



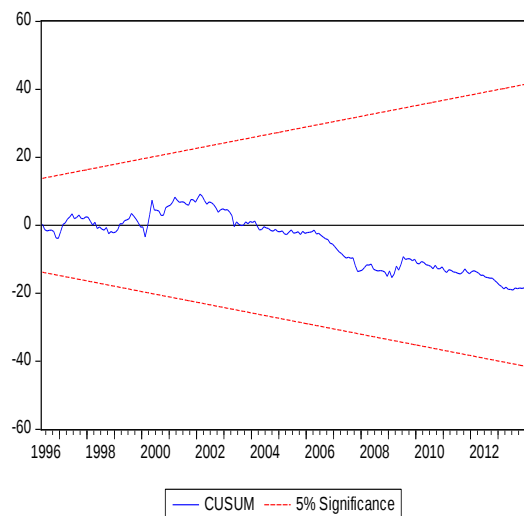
(d) Cusum Test for GREENEX



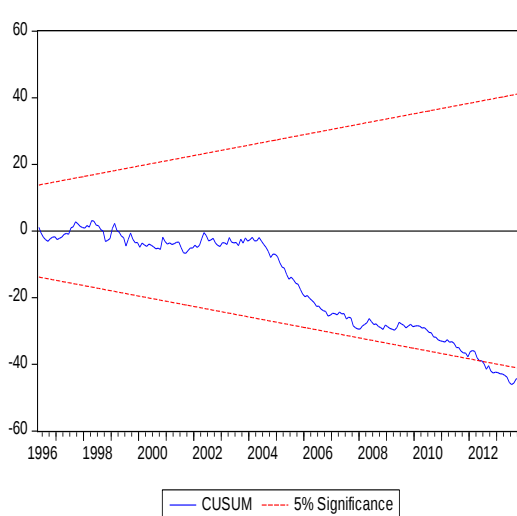
(e) Cusum Test for Mimicking



(f) Cusum Test for BCNSR



(g) Cusum Test for SRBC



(h) Cusum Test for SRNBC

Table 8: Impact of Boom and Recession on Fama-French Three Factor Model

Portfolios/ Indices (Equation 3)	Recession Period				Boom Period			
	Multi Factor Alpha	Market Risk Premium	Size Effect	Value Effect	Multi Factor Alpha	Market Risk Premium	Size Effect	Value Effect
NIFTY	0.000029	0.841***	-0.106*	0.076	0.000707	0.931***	-0.162	0.028
SENSEX	-0.001169	0.836***	-0.101	0.042	0.002032	0.930**	-0.196	0.054
ESG	0.011743***	0.989***	0.059	0.272***	0.004352**	0.997	0.243*	-0.022***
GREENEX	0.010655***	0.865***	0.083	0.113	0.011504	0.951	-0.109	0.73
MIMICKING	0.001570	1.036***	0.402***	0.329***	0.001316	1.039	0.510	0.037**
BCNSR	-0.002739	0.905***	0.070	0.101	0.004406	0.972	-0.273***	0.301**
SRBC	0.011162***	0.838***	-0.271***	0.233***	0.004556**	0.949***	-0.123*	-0.002***
SRNBC	0.011973***	1.111***	0.307**	0.353***	0.004070	1.036	0.580*	-0.047***

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

CONCLUSION AND POLICY IMPLICATIONS

This paper examines an interesting question as to whether the portfolios of socially responsible stocks outperform those of general stocks in the Indian stock market especially during different business economic conditions. Performance of four socially responsible stocks portfolios (ESG, GREENEX, SRBC and SRNBC), four general stocks portfolios (NIFTY, SENSEX, BCNSR and Mimicking) and market portfolio (CNX 500 Equity Index) have been analysed using various techniques. Our results are consistent with those of Guerard (1997), Kempf & Osthoff (2007) and Tripathi & Bhandari (2012, 2015). It is found that socially responsible stocks portfolios generated significantly higher returns than other portfolios whether it is boom or recession. These portfolios outperformed both general stocks portfolios and market portfolio in terms of all the risk-adjusted measures used in the paper. The result of Fama's decomposition measure demonstrates that socially responsible portfolios outpaced other portfolios even on the basis of net selectivity return during boom and recessionary periods. It means that even with less diversification benefits, socially responsible portfolios are managed to produce sufficient higher returns during different periods. The impact of boom and recession was significant enough for socially responsible portfolios which are producing significant positive and higher excess returns than other portfolios. Thus, besides augmenting existing literature, our results clearly indicate that socially responsible companies are well rewarding in Indian stock market. These results are more promising than the results of Hamilton *et al.* (1993), Gregory *et al.* (1997) and Statman (2000).

Our findings support the view that socially responsible investing is boon for investors in India. These findings have

important implications for companies, investors, regulators, policy makers and mutual funds. General companies should change their attitude and agenda towards social responsibility. Due to significant higher returns socially responsible stocks portfolio can be used to build up defensive and better performing portfolios by socially responsible investors in India. Thus, investors should put more faith on socially responsible companies and start investing in these companies. We suggest that regulators, policy makers and mutual funds should construct and make available various socially responsible investment products to initiate the movement of socially responsible investing in India. The policy makers can also push financial sector reforms in the direction of SRI to enforce CSR law.

However, the study is not free from certain limitations. Due to non-existence of the ESG Index prior to 2007 and GREENEX Index prior to 2012 consistency of the results may get affected. As a result, the previous data from 1996 onwards is based on the companies in the indices which may not provide a true picture.

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