INTERNATIONAL JOURNAL OF RESEARCH IN COMPUTER APPLICATION & MANAGEMENT

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- Bowersox, Donald J., Closs, David J., (1996), "Logistical Management." Tata McGraw, Hill, New Delhi.
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- Always indicate the date that the source was accessed, as online resources are frequently updated or removed.

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LONG RUN FINANCIAL PERFORMANCE ANALYSIS OF BSE ESG CONSTITUENTS

AMEE I DAVE
ACADEMICIAN
B-201, RADHE-SHYAM RESIDENCY, NR.AASHRAY BUNGLOWS, GERI COMPOUND ROAD, GOTRI, VADODARA

ABSTRACT

*The Objective of this paper is to Study Comparative long run performance of the SRI and Non-SRI Stocks. Study is based on Top 10 BSE ESG Constituents (SRI Stock) and its peers by taking the daily stock prices from 2014-15 to 2018-19. AARs and CAAR is computed and checked statistically at 5% level of significance. In short run Average Daily stock prices return generates good economic return than the market. But overall performance of Securities (CAAR) is not giving good return in short run 2 months period. For the holding period of 2 years study found positive consecutive return. [SRI Stock CAAR-**8.35**(14-15), **8.83**(15-16)-Non SRI Stock **6.14**(14-15),**5.33**(15-16)]. Whereas in long run CAAR values of both SRI & Non-SRI stocks also gives positive return. SRI stocks CAAR shows more positive return in 5 years (8.35,8.83,3.97,2.43,5.46) as compared to Non-SRI (6.14,5.33,1.89,1.96,2.24). So, like other studies on long run security prices return this study even proves that in long run BSE ESG Constituents generates Positive return and it is advantageous to invest in it. The computed figures here only show the market adjusted abnormal return without considering certain company specific factors like size, profitability, investment in total assets etc. This limitation can be overcome in the future research.*

KEYWORDS

SRI (socially responsible investment), CAAR (cumulative average abnormal return).

JEL CODES

G11, G12, G19.

INTRODUCTION

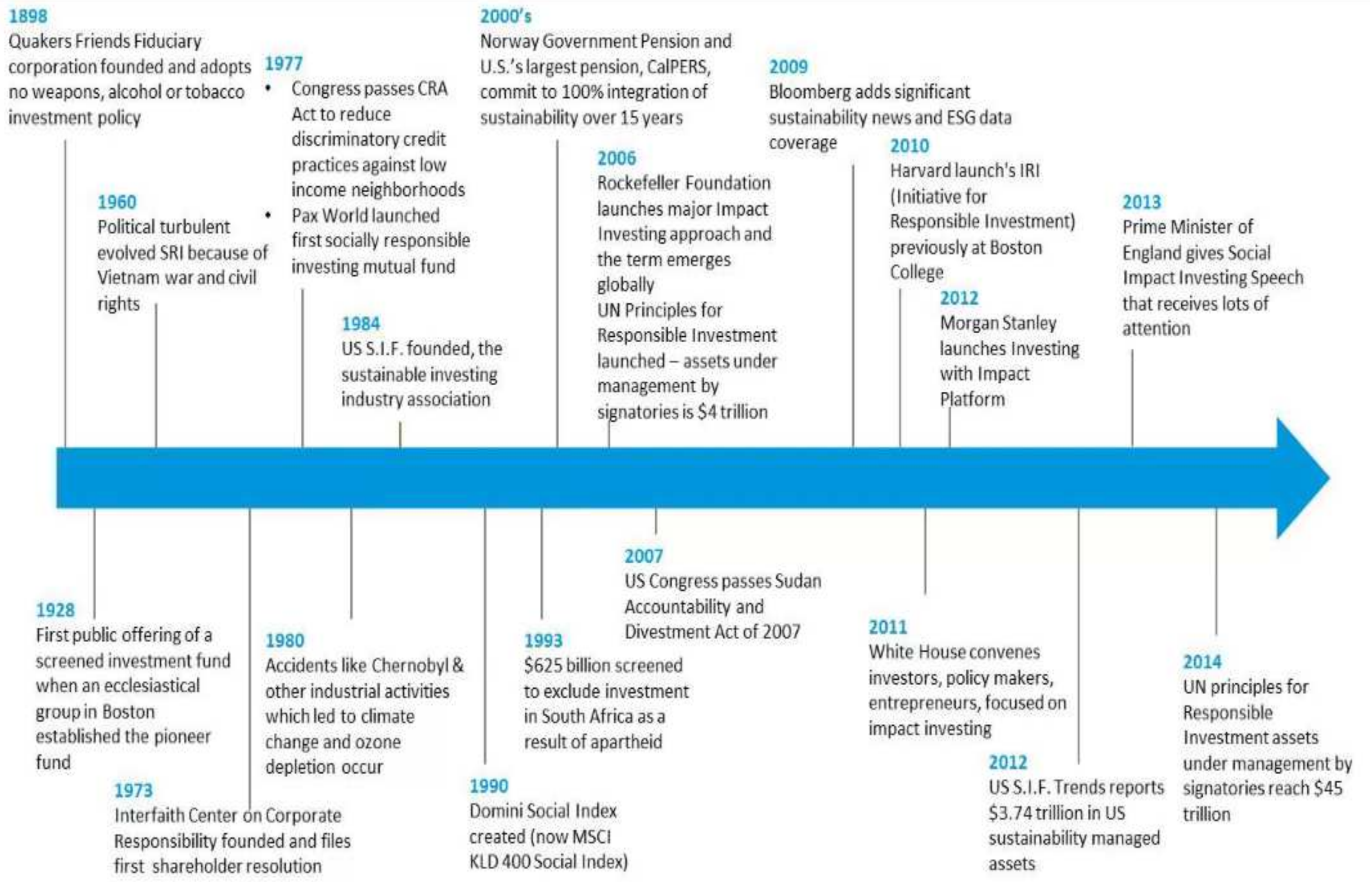
The Concept of Sustainability is on rise in today's Economic world. The increasing awareness on global warming Proper maintenance and balances of eco-system, human rights & economic development of the business is increasingly becoming a challenging task for the management of the business. In this light UNDP, international conference on Sustainable development held at Rio de Janerio in 2012 has introduce the 17 SDGs which is to be followed by all the countries across the world on voluntary basis. The attempts are made by the different states on the achievement of these goals. Currently India is working on SDG 12 i.e., Sustainable consumption and Sustainable Production. Under the achievement of this goal government under its think tank "Niti Aayog" has started several remedial measures like "Amrut, Digital India, Make in India, Swachh Bharat Abhiyan etc. In Developed Nations under the sustainable development the concept of Green business and Green economy has been emerged. Businesses have started working on producing environmentally friendly products and services and equally giving weightage to human rights and accordingly framing the business strategy.

In order to promote the concept of Green business and Green economy capital market of the different countries have started producing sustainable indices by considering the certain ESG criterion. And the introduction of certain green financial products like green bonds, Green Mutual funds etc. Even banks have started giving credit to certain priority sectors on analyzing their ESG Criterion. The emergence of such kind of financial Products and investment therein are called the sustainable investment, impact investing, socially responsible investing, or ESG investing. It has been emerged in the year 2005 under the land mark study report on **"Who Cares Win"** in the U.S under the ageis of Ivo Knoepfel. (kell, 2018) The basic objective of the report was to integrate the ESG Factors to capital market and make good business senses about ethical investing and sustainable markets and giving better outcomes for the society. ESG investing incorporates all the three factors viz., Environmental, Social and governance score of the business. Covering the different dimensions like environmental resource-depletion, renewable energy, clean technology, Pollution, Climate change, Social human rights, Workplace conditions, discriminations, community relations, and governance compliance, transparent reporting and managing conflicts. The success of United Nations Principles for Responsible Investment (UNPRI)—which calls for the incorporation of ESG factors in investment and ownership decisions—is a significant indicator of the growth of sustainable investment. (https://www.unpri.org, 2018).

The integration of ESG Factors to the capital market started in the year 1990 with the introduction of the MSCI KLD 400 Social index and till date there are more than 14 sustainable indices developed across the globe. In India we have 6 Major, 13 Sectorial, and 3 thematic indices. These include BSE Carbonex, BSE Greenex and BSE ESG.

This concept of Sustainable investing is gradually taking root in India. Still it is in its nascent stage, not replaced with main stream investment. Majorly this SRI seems in Portfolio products like Mutual funds, Pension funds, ETFs etc. Yes bank in 2015 has issued its first green bond, and few more in list are Axis bank, NTPC ltd, IREDA,L&T ltd etc have contributed in green investment. In May 2018, SBI Funds Management Ltd renamed its Magnum Equity Fund as Magnum Equity ESG Fund. In April 2007, ABN AMRO mutual fund, now BNP Paribas Asset Management India Ltd, launched India's first SRI (socially-responsible investment) fund. Considering this Responsible investing as contemporary topic in financial management and less researched topic in. India Researcher has made an attempt to know the long term performance of sustainable indices constituents and its peers.

CHART 1: EVOLUTION AND EMERGENCE OF GREEN INVESTMENT



Sources: Thomson Reuters, "History of socially responsible investing in the U.S.", August 2013, and Envestnet research.

LITERATURE REVIEW

Long run financial performance analysis is a vast and widely researched topic in India. Mainly in literature long run financial performances is studied to check impact of different corporate events and its financial implications. Like Post IPO, Share buyback, Merger and Acquisition stock market return of the sample firms. This analysis is being performed with different models like BHAR Model, CAAR Model, CAPM & Arbitrage Pricing Model, Fama & French (1993, 2015) three, four and five factor model to assess long run Portfolio output with different company specific factors. Today there is a shift in the motive of capital employment of business and all its stakeholders. Psychology & Objective of investment shifting from Economic (Profitable investment) to Responsible investment (Considering ESG Criteria)

Jeroen Derwall (2005) "Eco Efficiency Premium puzzle" has studied the relative economic value of two equity portfolios that differed in eco-efficiency. Based on Innovest Strategic Value Advisors' corporate eco-efficiency scores, high-ranked portfolio provided substantially higher average returns than its low-ranked counterpart over the 1995-2003 period. And it is found that SRI produced superior return. (Jeroen Derwall, 2005)

H. Camilla Stenström,J.T (2007) "Evaluating the performance of the Socially responsible investment Funds; A holding Data Analysis." has investigated on the performance of SRI Mutual Funds to traditional one. This is with @ Micro level - Firm level performances of Portfolio and @ Macro level- fund management performance. And the results from this study shows that at an overall fund performance level, SRI funds do not outperform regular funds. Additionally, Evidence show that the replicating portfolios perform better than the regular funds, suggesting that certain socially responsible practices affect firm level performance positively. On a fund management level, the results indicate that the fund management of regular funds is better than SRI funds.

Rajib Bhattacharya (2013) "Effect of Going Green on Stock Prices: A Study on BSE-GREENEX" studied on the Comparative financial performance of the BSE Greenex to BSE Sensex and BSE 500. Computing quarterly cumulative mean daily returns and its S.d. it is found that BSE Greenex is giving superior return over BSE Sensex and BSE 500.

Gunnar Friedea, T. B. (2015) "ESG and financial performance: aggregated evidence from more than 2000 empirical studies" has found that roughly 90% of studies find a nonnegative ESG–CFP relation. There is a positive ESG impact on CFP appears stable over time. **Anupam Dutta, P. D (2015)** has invested on the long run security price performance and has reviewed a large number of long-run event studies and fined that the analysis of long-run abnormal performance is perfidious. In addition, an empirical example is given to compare several measures of long run stock price performance to check significance and authenticity of return as per different models. The empirical analysis shows that a recently proposed calendar time portfolio method has better performance than the conventional approaches.

Skagestad (2017) "A comparison of sustainable and conventional mutual funds in emerging markets "has studied the difference in financial performance of the conventional and sustainable mutual funds under three different economic cycle steady development, Recession and recovery. The results of the study reveal that there is no significant difference in risk adjusted return of the sustainable and conventional mutual funds.

George kell (2018) article on "**Remarkable rise of ESG"** mentions the increasing importance of incorporating non-financial data in annual reports of the companies by using the standardized and most widely used (80%of top 500companies as per Forbes list) GRI framework, recently developed IIRC Framework and TCFD etc. Moreover, many portfolio products like mutual funds, pension funds, ETF, insurance products etc is receiving premium market performance by incorporating ESG factors.

Edelweiss securities ltd (2018) Report on "Seeking Growth the ESG Way." has found that investors and markets reward companies that score highly on ESG parameters. For instance, MSCI ESG Indices for India and overseas have consistently outperformed their respective broader benchmarks delivering superior risk-adjusted returns.

Donath, L.E., Ioan, R., Mandimutsira, T. (2018) has studied the comparative financial performance of the SRI MF to Non-SRI MF by employing Sharpe and Markowitz model to determine Market value of sample assets. It is found that in short run SRI Funds performed better than Non-SRI and in long run vice-a-versa.

SP Global rating agencies article (2019) on The ESG Advantage: Exploring links to Corporate Financial Performance has found that companies which are focusing on ESG issues have achieved reduced costs, improved in worker productivity, mitigated risk potential and created revenue generating opportunities.

STATEMENT OF THE PROBLEM

As mentioned earlier in the literature review many empirical studies available on long run analysis of the stock market based on different event-based post period analysis. Indian capital market has integrated the impact of different environmental, Social and Governance aspect of the business in the various financial products and started promoting the concept of Sustainable investment. But seeking the Growth ESG way in long run is yet questionable so researcher has tried to find long run Stock market return of certain ESG constituent from BSE ESG 100 index.

RESEARCH OBJECTIVE

To study Comparative performance of BSE ESG Constituents and its peers in short and long run.

RESEARCH HYPOTHESIS

From the above literature it is found that investors and market reward companies better which scores high on ESG Parameters. Based on this it is hypothesized that:

H0: SRI (ESG) Stocks outperform Non SRI in long run.

H1: In long run there is no difference in performance of SRI & Non-SRI Stock

RESEARCH METHODOLOGY

The present study is empirical and analytical one consisting of top 10 **BSE ESG 100**Constituents and its peers as control firms. Study has employed **CAAR** methodology **(Iqbal Thonse Hawaldar1, 2018)** by taking daily stock prices for all the trading days between **2014 to 2019**. Study has evaluated total **23930 observations** based on the **10 sample**[1] companies and 1210 trading days (10*1210=12100 Observations) and **10 Control**[2] firms and 1183 trading days (10*1183=11830 Observations), For the significance of the results study has used **t-statistics** value at 5% level of Significance.

METHODOLOGY TO EVALUATE LONG RUN PERFORMANCE

Present study uses cumulative average abnormal return (CAAR) to evaluate the long run performance of Stocks. Daily returns are computed using the adjusted closing price starting from the listing day. The daily raw return for security *i*, is computed as under:

Rit=Pit−Pit−1/Pit−1….. (1)

Where, R_{it} is the return on security *i* for day *t,* P_{it} is the adjusted closing price of security *i* on day *t* and $P_{it-1}$is the adjusted closing price of security *i* on day *t*−1.

The market return for the same period is computed as under:

Rmt[4]=It−It−1/It−1….. (2)

Where, R_{mt} is the market returns on day *t*, I_t is the closing index level on day *t* and I_{t-1} is the closing index level on day *t*−1.

Abnormal Return for the Same Period is computed as follows.

ARit=Rit−Rmt….. (3)

Where, AR_{it} is the benchmark-adjusted return for stock *i* on day *t,* R_{it} is the return for stock *i* on day *t,* and R_{mt} is the return on S&P BSE 100 used as the benchmark return for the same period. The average benchmark-adjusted return (average abnormal return) on a portfolio of *n* stocks for day *t* is the equally weighted arithmetic average of the benchmark-adjusted returns:

$$AAR_t=1/n\sum_{i=1}^{n} AR_{it}$$

where, AAR_t is the average abnormal return (benchmark-adjusted) on a portfolio of *n* stocks for day *t*, *n* is the number of stocks in the portfolio on day *t* and AR_{it} is the benchmark-adjusted abnormal return for stock *i* on day *t*. The cumulative benchmark-adjusted aftermarket performance (cumulative average abnormal return) from day *u* to day *v* is the summation of the average benchmark-adjusted returns or AARs:

$$CAAR_{u,v}=\sum_{t=u}^{u} AAR_t$$

Where $CAAR_{u,v}$ is the cumulative average abnormal return from day *u* to day *v* and AAR_t is the average abnormal return on a portfolio of *n* stocks for day *t*.

Parametric significance test

In testing the long run performance of BSE ESG Constituents, the CAAR provides information about the average price behavior of securities during the Study period. If markets are efficient, the AARs and CAARs should be close to zero. Parametric "*t*-test" is used to assess significance of AARs and CAARs. The 5% level of significance with appropriate degree of freedom is used to test the null hypothesis of significant abnormal returns of SRI Stocks over Non SRI in long run. The conclusions are based on the results of *t*-values on AARs and CAARs of the study period. The *t*-test statistics for AAR for each study day is calculated as under:

t (AARt)=AARt/SE(AARt)

Where AAR_t is the average abnormal return on day *t* and SE (AAR_t) is the standard error of average abnormal return on day *t* which is computed as under:

SE (AARt) =SD (AARt)/√n

Where, SD(AAR_t) is the standard deviation of average abnormal return on day *t* and *n* is the number of stocks in portfolio *p* on day *t*.

The *t*-test statistics for CAAR for each Study day is calculated as under:

t (CAARt)=CAARt/SE(CAARt)

Where, SE ($CAAR_t$) is the standard error of CAAR on day *t* which is computed as under:

SE (CAARt) =SD (CAARt)/√n

SD ($CAAR_t$) is the standard deviation of CAAR on day *t* which is computed as under:

SD (CAARt) =SD (AARt) ∗√N

Where, *N* is the total number of days for which AAR is cumulated.

(Iqbal Thonse Hawaldar1*, 2017)

DATA ANALYSIS AND FINDINGS

TABLE 1: SHORT TERM 60 DAYS PERFORMANCE OF TOP 10 BSE ESG CONSTITUENTS

Days	AAR	t-Statistics	CAAR	t-Statistics	Days	AAR	t-Statistics	CAAR	t-Statistics
1	-0.0119	-2.1636*	-0.0119	-0.0540	**31**	0.0052	0.8254	-0.0787	-4.7551
2	0.0115	2.1296	-0.0004	0.5353	**32**	0.0049	0.4298	-0.0738	-5.2737
3	0.0039	0.7959	0.0035	0.1433	**33**	-0.0087	-1.8913*	-0.0825	-5.9743
4	-0.0026	-0.5098*	0.0009	-0.6658*	**34**	-0.013	-2.766*	-0.0955	-5.7587
5	-0.0051	-1.0408*	-0.0042	-0.9696	**35**	0.0029	1.1154	-0.0926	-5.319
6	-0.0018	-0.3462*	-0.006	-0.0776	**36**	0.0059	1.0727	-0.0867	-4.6166
7	0.0055	1.8333	-0.0005	-0.8097	**37**	0.0095	2.2619	-0.0772	-3.5253
8	-0.0048	-1.3714*	-0.0053	-0.2563	**38**	0.0152	2.1714	-0.062	-4.1671
9	0.0036	1.2414	-0.0017	-1.1120	**39**	-0.0127	-1.7887*	-0.0747	-4.4357
10	-0.0059	-2.0345*	-0.0076	-1.5504	**40**	-0.0049	-1.0426*	-0.0796	-4.4519
11	-0.003	-0.9375	-0.0106	-1.0057	**41**	-0.0003	-0.15*	-0.0799	-4.6250
12	0.0036	1.0286	-0.007	-0.6865	**42**	-0.0031	-0.7381*	-0.083	-5.0712
13	0.0022	0.4151	-0.0048	-0.0560	**43**	-0.0086	-1.7551*	-0.0916	-5.0514
14	0.0044	0.8627	-0.0004	0.8609	**44**	0.0003	***0.0469**	-0.0913	-4.5399
15	0.0068	1.1333	0.0064	0.9839	**45**	0.008	1.5385	-0.0833	-3.1253
16	0.0009	0.2368	0.0073	1.5212	**46**	0.0215	1.6929	-0.0618	-2.6349
17	0.0041	1.2059	0.0114	1.9282	**47**	0.009	2.6471	-0.0528	-2.3749
18	0.0031	1.3478	0.0145	1.6252	**48**	0.005	0.6579	-0.0478	-2.5618
19	-0.0022	-0.5789*	0.0123	0.8987	**49**	-0.0038	-0.8636*	-0.0516	-2.8654
20	-0.0053	-2.3043*	0.007	1.7597	**50**	-0.0063	-1.1667*	-0.0579	-1.8252
21	0.0035	1.129	0.0138	-0.3805*	**51**	0.0192	2.3133	-0.0387	-1.4854
22	0.0033	1.4348	-0.003	-0.3121	**52**	0.007	1.4286	-0.0317	-1.5883
23	-0.0168	-2.1*	-0.003	-1.8721	**53**	-0.0022	-0.7586*	-0.0339	-1.2672
24	-0.0178	-4.8108*	-0.0208	-2.6153	**54**	0.0067	1.4565	-0.0272	-1.7166
25	-0.009	-1.2329*	-0.0298	-2.8939	**55**	-0.01	-2.9412*	-0.0372	-1.3418
26	-0.0032	-0.4571*	-0.033	-3.9272	**56**	0.0079	1.2951	-0.0293	-1.0012
27	-0.0148	-2.3871*	-0.0478	-4.8545	**57**	0.0073	2.6071	-0.022	-0.7669
28	-0.0143	-1.4592*	-0.0621	-5.9415	**58**	0.0051	0.7183	-0.0169	-0.7670
29	-0.0267	-2.6176*	-0.0888	-5.5389	**59**	-0.0006	-0.15	-0.0175	-0.7940
30	0.0049	1.3611	-0.0839	-5.1274	**60**	-0.0021	-0.7778*	-0.0196	-0.5778

(Source: Author's own compilation-Daily stock prices and BSE ESG 100 Market data sourced from www.yahoofinance.com)

Note: Parametric t-test Values are shown in Parenthesis Significant at 5%Level.

From the Table 1 above it is found that in short run out of 60 days 32 AARs were positive and only one 44th day AAR is Significant at 5% level. And the remaining 28 AARs were negative and significant. In terms of Cumulative return only 9 days CAAR out of 60 days shows the Positive return and only 2 CAAR out of 9 Positive were significant at 5%. It means in short run Average Daily stock prices return generates good economic return than the market. But overall performance of Securities (CAAR) is not giving good return throughout the Short-term Study Period.

LONG RUN ANALYSIS

FIGURE 1: 5 YEARS AAR & CAAR OF TOP 10 BSE ESG FIRMS

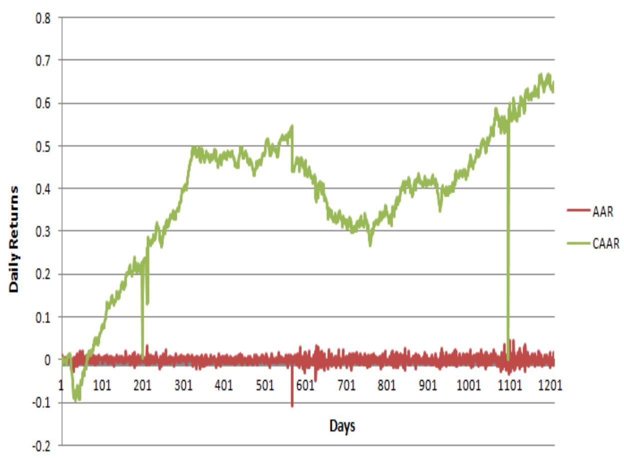
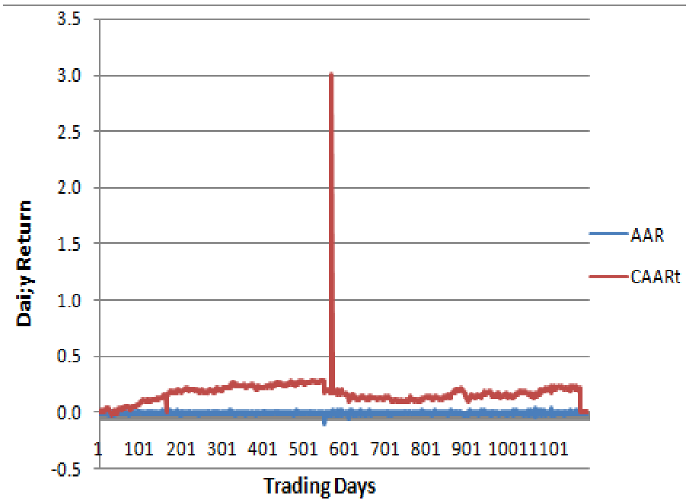


FIGURE 2: 5 YEARS AARS & CAARS OF BSE ESG PEERS



Source: Author's own Compilation

From the figure 1 above it is found that AAR ranges between -0.1 to 0.1for all the trading days under study. Giving negative returns in mid of the 2015-16 and 2017-18 but improved the position again in the year 2018-19. So Overall Daily Security performance of ESG Constituents is Significant & in the short-term investor will gain from this ESG investment. CAAR values shows increasing trend for the first half of the study period and then declines in mid of 2016-17 and 17-18(approximately near 780 trading days) and then again showing increased positive return till the end of 5th (2018-19-1210 trading days) year. So, like other international studies on long run stock prices return here also it is proved that in long run SRI Stocks gives significant good economic return and it is advantageous to invest for long term in BSE ESG Securities.

In Comparison to BSE ESG, from the figure 2 it is found that BSE ESG peers are also showing the same trend as BSE ESG in terms of Daily stock return (AARs)for short term investment and (CAAR) for long run investment. But Control firms returns were slightly less as compared to BSE ESG Constituents.

From the above analysis it is suggested long term SRI investment is preferable for the Aggressive investor and for Conservative, Non-SRI Stocks (Control Firms) as in long run it gives steady& positive return. Moreover, as per table 02 given below BSE ESG Control firms CAARs are Significant for the year 2016-17 to 2018-19. So, overall long-term investment is advantageous for both SRI stocks as well as its peers.

TABLE 2: LONG RUN ANALYSIS OF ESG CONSTITUENTS AND ITS PEERS

Sample/Control Firms	2014-15 (231 TD)	2015-16 (475 TD)	2016-17 (766 TD)	2017-18 (966 TD)	2018-19 (1210 TD)
BSE ESG Firms CAAR	0.3024	0.4468	0.3131	0.4333	0.6397
t-values	8.3568	8.8341	3.9790	2.4630	5.8781
Control Firms CAAR	0.1967	0.2451	0.1360	0.1591	0.2201
t-values	6.1407	5.3313	1.8953	1.9623	2.2569

Source: Own Compilation

Note: Parametric t-test Values are shown in Parenthesis Sig. at 5%Level.

From the Table 2 it is observed that in long run all CAAR values turn positive for both SRI & Non SRI Stocks. As Compared to Non-SRI Stocks SRI Stocks CAAR is much higher in all the years of the study but not significant at 5% level of significance. **As Per CAAR figures SRI Stocks out performs Non-SRI in long run but statistically it is not significant. So we reject the null hypothesis i.e., in Long-run SRI Stocks out performs the Non-SRI.**

LIMITATIONS AND FUTURE SCOPE OF THE RESEARCH

The present study has used top 10 BSE ESG 100 index Firms based on market capitalization which is not representing all SRI Constituents. Future studies can be performed on the all BSE ESG Constituents, BSE Carbonex, & BSE Greenex Constituents to measure the overall performance of all the Sustainability indices constituents in long run. Sectorial sustainable performance evaluation is also a potential area of research to check sectorial performances of all Sustainable firms. Importantly this study is based on the assumption that considering other things being constant (i.e., without considering Size, Sales Turn over and other factors affecting the financial performance of the firm.) Stock prices return (i.e., AAR & CAARs) shows the actual financial performance of the firms. So future long term financial performance studies can apply the **Fama and French three factor and Five factor model** (which is considering Size, Sales Turn over and other factors affecting the financial performance of the firm.)& also **Calendar Time and Portfolio Model** which is less studied, widely applied in developed countries can be used for the better accuracy of the results. (Dutta, 2012)

CONCLUSION

Over the past few years, sustainability has emerged as a crucial aspect of investment. The increasing no. of ESG Equity indices across the major stock exchanges is only reflective of this expansion. In India also, the concept of Sustainable and Socially responsible investment is on rising mode. The introduction of various SRI based portfolio products like bonds, ESG MF, ESG insurance & Sustainable investment loans to certain priority sectors and development of the sustainable indices By BSE like BSE Greenex, BSE ESG, BSE Carbonex in the year 2012 is an indication of boosting Green investment and giving weightage to social and governance aspect in investment. So, to check the financial performance of these indices researcher has computed CAAR of Top 10 BSE ESG constituents for the time period 2014-15 to 2018-19 and compared it with its peers. In analyzing data, it is found that in long run both the stocks BSE ESG and Non-ESG stocks gives positive return but BSE ESG Stocks shows rising trend & it is advantageous to invest in these stocks. So, the construction of such kind of indices is way forward of stock exchanges contribution to promote sustainable investment and investors privilege to attain both social and economic purpose.

FINANCIAL IMPLICATIONS

The present study is useful guide to different categories of investors like retail Socially Responsible investor, Fund managers may use to create ESG Portfolio, investment advisers, Insurance companies in incorporating ESG Based product for their product performance analysis. The Present study may enable all different types of investors in building up their socio-economic investment strategies that maximize their returns and minimize loss.

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