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GREENEX (Carbon Index): A Comparative Study On Returns of BSE-Greenex, BSE-Sensex & BSE-Sensex 500

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Abstract

Environment protection is a topic of global concern today. Investors and consumers are willing to invest in companies that are responsible towards environment, taking steps for environment protection and reducing their carbon emissions. To provide a benchmark for measuring these activities BSE launched BSE-GREENEX Index on 22nd Feb. 2012. It allows investors to invest based upon the carbon footprints of the companies and those institutions which are responsible towards Environment.

It is an index of 25 Companies whose performance is measured in terms of Carbon Footprints. It takes into account Carbon Emission along with profitability with equal weightage to take care of Profits as well as Responsiveness towards Environment.

This paper aims at measuring the performance of BSE-GREENEX Index over a period of five years and comparing it with BSE -SENSEX & BSE-SENSEX 500 index and to find out which one is giving more returns to the investors. It will be a Quantitative Longitudinal study and data would be taken from BSE India website.

Keywords: BSE-GREENEX, Green Securities, Returns from BSE-GREENEX, Environment Concerns.

INTRODUCTION

Earlier, the objective of business organisation was on profit maximization and reduction of cost. But that ideology had witnessed a change and objective was shifted to the shareholders' wealth maximization.

Owning to the condition of environment, climate change, global warming and fast depletion of natural resources, the need was felt to focus on environment protection along with growth and profitability. Brundlant Report in the year 1976 focused upon Sustainable Development. Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs1. In line with it, business houses are realising that long run interest of business lies in the protection of environment. The companies are reviewing the activities that are degrading environment and posing a threat to the existence of humankind. Going green refers to activities, usually of corporate enterprises, involving activities with a deliberate aim to reduce emission of pollutants, produce goods which are environment friendly and resorting to technologies which promote environmental protection2. Going green can help an organisation in many ways such as building customer trust, cost reduction, reducing statutory compliance and management of risk etc. Even customers and investors today are highly progressive and want to invest in environment conscious firms. A green company is one which plans and execute the business activities in a way to minimize negative impact on environment3. To keep a track of such companies, BSE launched S&P BSE GREENEX index on 22nd Feb 2012.

BSE developed GREENEX index in collaboration with IIM – Ahmedabad and gTrade Carbon Ex Ratings Services Private Limited (gTrade). GREENEX when launched constituted 20 companies from the broader BSE 100 index. On 27th Dec. 2012 the constituents were increased to 25 companies. BSE-GREENEX measures the performance of the companies based on greenhouse gas number, free float market capitalisation

[1] Brundlant Report

[2] Rajib Bhattacharya, Effect of Going Green on Stock Prices: A Study on BSE-GREENEX

[3] Wikipedia, https://en.wikipedia.org/wiki/Green_company

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and turnover. It provides the investors with a group of companies that are working for environment protection and are financially sound.

LITERATURE REVIEW

Aashna Aggarwal, Priyam Kumar Singh, Jaskiran Arora and Chitrakalpa Sen

With a surge in awareness related to environment, companies are preferring to go green. Going green focuses on environment friendly practices, reducing emission of pollutants and promotion of environment friendly technology. The study wants to investigate the effect of information shocks on the returns of GREENEX and BSE200. The results propose that GREENEX is less sensitive to policy announcements than BSE200 although the difference is marginal, which implies that green stocks are safer bets, in case of significant information shocks in the marketplace.

Ruchika Bammi

Along with financial performance, business houses have to focus environmental aspect also - due to regulations, increasing market pressure and attention of investors towards company's environmental concerns. The paper aims to test the existence of semi- strong form of market efficiency in Indian capital market by studying the impact of announcement of firm's name to be a part of BSE-GREENEX index (India's first green index) on the daily return series. Event study methodology is used on 20 companies belonging to BSE Greenex, to study the behaviour of the daily stock return series of the company. The paper suggests negative returns during the event window opposite to researcher's expectation. The suggested probable reason is Indian investors are not that conscious about Green image of the company.

Swalih M. M. and Vinod M. S.

Fast depleting natural resources and awareness about environment protection has made many organisations to follow green practices. This has led to creation of S&P BSE GREENEX index in INDIA. The study focuses on calculation of Altman Z- score to verify the financial performance of companies listed on BSE GREENEX and also to measure financial distress of aforesaid companies. The paper reveals that out of 25 companies listed on the GREENEX index 3 are in safe zone, 10 are in grey zone and 12 are in distress zone. The paper recommends investment in companies listed on BSE GREENEX index as these companies have good financial condition along with negligible impact on environment.

Sumit Kumar Maji and Ashoke Mondal

Business houses have been forced to mould their business strategy in relations of environment protection due to environmental pollution, increasing numbers of natural calamities and global warming. For a healthy growth, business has to be carried out in a way that does not harm environment. The study is carried out with objective to find risk and return of BSE GREENEX and compare the risk and return of GREENEX from another popular index. The outcome suggests that company specific, industry specific and economy specific factors influence the investment decisions of investors and there is no evidence that environment friendly measures undertaken by a firm affects the investment decision.

OBJECTIVE OF STUDY

This research has been carried out to compare the returns of two indexes BSE-GREENEX and BSE SENSEX & BSE-SENSEX 500 over a period of five years. The objective is to discover the index out of the two which is profitable to invest in. The Study has been done to find out the quarterly average and coefficient of variations in returns of BSE-GREENEX and BSE SENSEX & BSE-SENSEX 500.

METHODOLOGY

The daily opening and closing values of the indexes were taken from BSE India website for a period of five years i.e. starting from 1st Jan 2014 to 31st Dec 2018. To facilitate comparison the period is divided into 20 quarters. The daily returns have calculated using the formula $R_t = (V_t - V_{t-1})/V_{t-1}$, where R_t stands for daily returns and V_t and V_{t-1} refers to closing values on present and previous day respectively. Then the Mean, Standard Deviation and Coefficient of Variation is calculated on quarterly basis for both the indices.

Mean Return- Mean return is calculated on quarterly basis. By adding up daily returns from that quarter and dividing by the number of trading days in that quarter. It shows the average return earned during that quarter.

Standard Deviation – It measures the deviation of returns from the mean returns.

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Coefficient of variation – It measures the volatility of investment. It is calculated as a ratio of Standard deviation with its mean and it is useful in comparing the degree of variation of one data from the another.

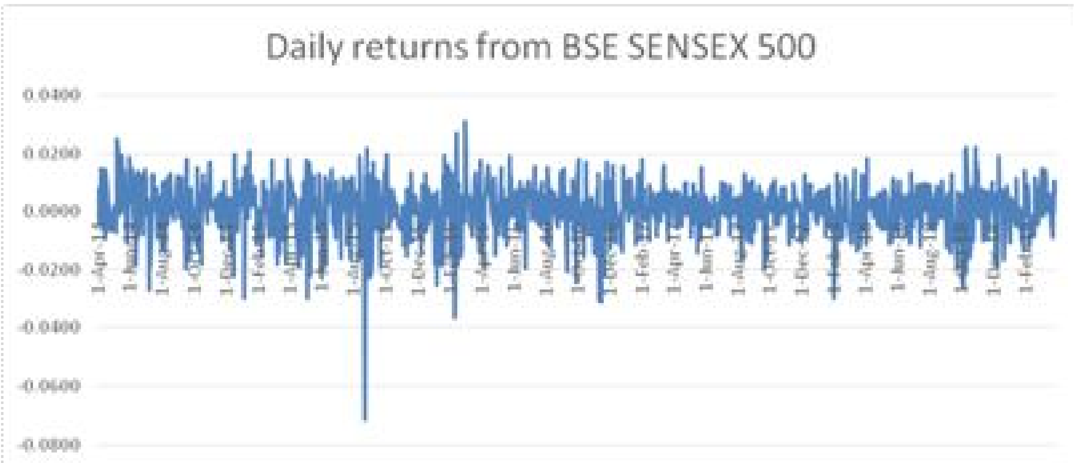
FINDINGS

The pattern of returns from BSE GREENEX quietly differs from returns from BSE SENSEX.

Fig 1. Daily returns from BSE GREENEX

Fig. 2 Daily returns from BSE SENSEX

Fig. 3 Daily returns from BSE SENSEX 500



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The mean return from BSE GREENEX is greater than the mean return from BSE SENSEX and BSE SENSEX 500 in most of the quarters when calculations were done on quarterly basis.

Table 1 Mean daily returns (calculated quarterly)

Year	Quarter	Mean daily returns Greenex	Mean daily returns Sensex	Mean daily returns Sensex 500
2014	Quarter 1	0.0026	0.0021	0.0027
	Quarter 2	0.0013	0.0007	0.0006
	Quarter 3	-0.0002	0.0005	0.0009
	Quarter 4	0.0010	0.0002	0.0004
2015	Quarter 1	-0.0003	-0.0002	-0.0003
	Quarter 2	-0.0010	-0.0010	-0.0007
	Quarter 3	0.0003	-0.0001	0.0002
	Quarter 4	-0.0006	-0.0006	-0.0008
2016	Quarter 1	0.0015	0.0010	0.0013
	Quarter 2	0.0004	0.0005	0.0009
	Quarter 3	-0.0002	0.0005	0.0009
	Quarter 4	0.0015	0.0017	0.0022
2017	Quarter 1	0.0004	0.0007	0.0007
	Quarter 2	0.0000	0.0002	0.0005
	Quarter 3	0.0014	0.0014	0.0016
	Quarter 4	-0.0014	-0.0006	-0.0010
2018	Quarter 1	0.0007	0.0011	0.0004
	Quarter 2	-0.0001	0.0003	-0.0001
	Quarter 3	-0.0003	-0.0001	0.0000
	Quarter 4	0.0004	0.0011	0.0008

Fig. 3 Mean returns (calculated Quarterly)

The variation in returns also differs between BSE GREENEX and BSE SENSEX & BSE-SENSEX 500. From Q3 2014 to Q 2013 the variation in returns from BSE-GREENEX shows high variation. But after this for almost two years SENSEX witnessed greater variability. But after Q4 2016 BSE GREENEX is showing variation in returns greater than that of BSE SENSEX & BSE-SENSEX 500.

Table 2 Standard Deviation of returns (calculated Quarterly)

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Year	Quarter	GREENEX	SENSEX	SENSEX500
2014	Quarter 1	0.008	0.009	0.009
	Quarter 2	0.007	0.008	0.009
	Quarter 3	0.008	0.008	0.008
	Quarter 4	0.009	0.010	0.009
2015	Quarter 1	0.011	0.010	0.010
	Quarter 2	0.013	0.013	0.013
	Quarter 3	0.007	0.007	0.007
	Quarter 4	0.013	0.012	0.012
2016	Quarter 1	0.009	0.009	0.008
	Quarter 2	0.008	0.007	0.007
	Quarter 3	0.010	0.009	0.010
	Quarter 4	0.007	0.006	0.006
2017	Quarter 1	0.005	0.005	0.005
	Quarter 2	0.007	0.006	0.007
	Quarter 3	0.007	0.006	0.006
	Quarter 4	0.008	0.008	0.008
2018	Quarter 1	0.007	0.006	0.007
	Quarter 2	0.008	0.006	0.007
	Quarter 3	0.012	0.011	0.011
	Quarter 4	0.008	0.007	0.007

Fig. 4 : Standard Deviation of returns (calculated Quarterly)

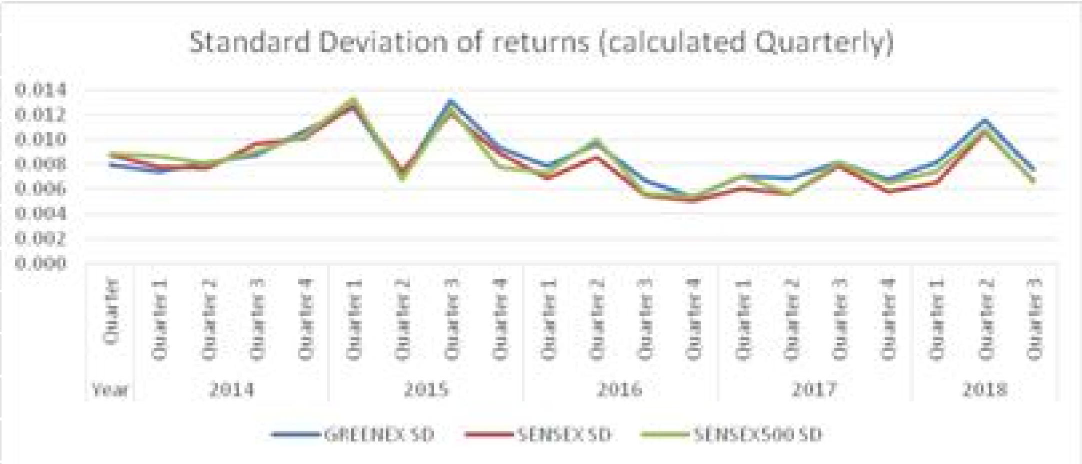

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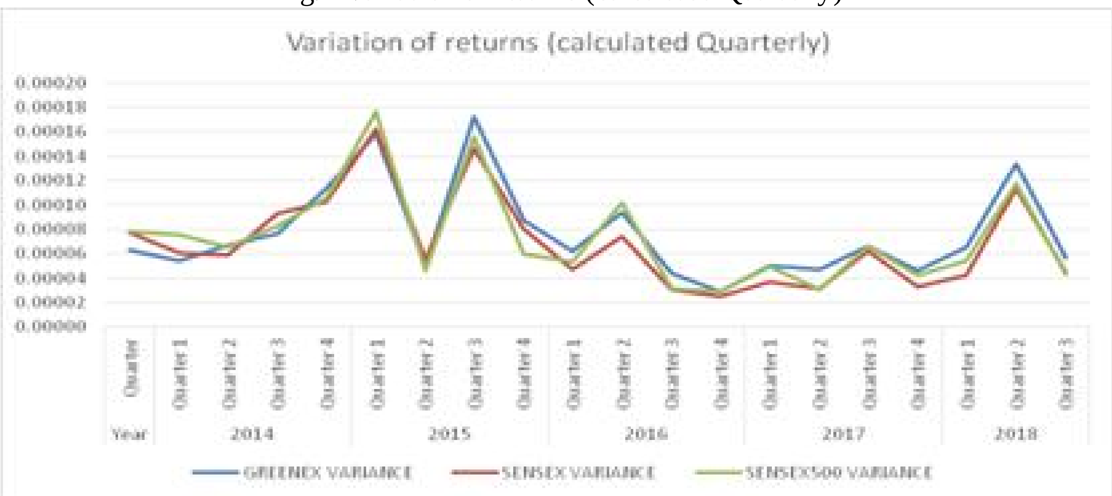
Table 3 Variation of returns (calculated Quarterly)

Year	Quarter	GREENEX VARIANCE	SENSEX VARIANCE	SENSEX500 VARIANCE
2014	Quarter 1	0.00006	0.00008	0.00008
	Quarter 2	0.00005	0.00006	0.00008
	Quarter 3	0.00007	0.00006	0.00006
	Quarter 4	0.00008	0.00009	0.00008
2015	Quarter 1	0.00011	0.00010	0.00011
	Quarter 2	0.00016	0.00016	0.00018
	Quarter 3	0.00005	0.00006	0.00005
	Quarter 4	0.00017	0.00015	0.00016
2016	Quarter 1	0.00009	0.00008	0.00006
	Quarter 2	0.00006	0.00005	0.00005
	Quarter 3	0.00009	0.00007	0.00010
	Quarter 4	0.00004	0.00003	0.00003
2017	Quarter 1	0.00003	0.00003	0.00003
	Quarter 2	0.00005	0.00004	0.00005
	Quarter 3	0.00005	0.00003	0.00003
	Quarter 4	0.00007	0.00006	0.00007
2018	Quarter 1	0.00005	0.00003	0.00004
	Quarter 2	0.00007	0.00004	0.00005
	Quarter 3	0.00013	0.00011	0.00012
	Quarter 4	0.00006	0.00004	0.00004

Fig.4 Variation of returns (calculated Quarterly)



Coefficient of Variation means extent of variability in relation to the mean. Lower coefficient of variation is better as it represents smaller variation in returns in comparison to mean returns.

Out of 20 quarters under study, in 13 quarters BSE GREENEX had lower coefficient of variation. Hence, more consistent returns from BSE GREENEX in comparison with BSE SENSEX & BSE-SENSEX 500.

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Table 3: Coefficient of variation (calculated quaterly)

Year	Quarter	GREENEX CV	SENSEX CV	SENSEX 500 CV
2014	Quarter 1	3.08	4.23	3.25
	Quarter 2	5.49	10.93	15.24
	Quarter 3	-39.22	14.62	9.24
	Quarter 4	8.86	44.55	20.46
2015	Quarter 1	-32.76	-65.29	-38.15
	Quarter 2	-12.39	-12.46	-19.58
	Quarter 3	27.72	-145.65	36.12
	Quarter 4	-20.99	-21.34	-15.89
2016	Quarter 1	6.25	9.15	6.17
	Quarter 2	18.61	14.16	7.90
	Quarter 3	-46.41	16.40	11.55
	Quarter 4	4.36	3.24	2.58
2017	Quarter 1	13.24	7.28	7.96
	Quarter 2	-234.82	36.53	14.40
	Quarter 3	4.99	4.16	3.58
	Quarter 4	-5.95	-13.80	-7.82
2018	Quarter 1	10.33	5.22	15.64
	Quarter 2	-122.37	18.74	-61.16
	Quarter 3	-33.93	-82.81	224.13
	Quarter 4	18.63	6.07	8.15

	GREENEX_RETURNS	SENSEX_RETURNS	SENSEX_500_RETURNS
Mean	0.000326	0.000409	0.000460
Median	0.000631	0.000593	0.001068
Maximum	0.035846	0.032690	0.030936
Minimum	-0.062889	-0.063108	-0.071489
Std. Dev.	0.008831	0.008365	0.008625
Skewness	-0.476270	-0.552366	-0.844653
Kurtosis	5.586289	6.359236	7.604549
Jarque-Bera	389.9396	641.9182	1234.855
Probability	0.000000	0.000000	0.000000
Sum	0.401873	0.503603	0.566714
Sum Sq. Dev.	0.095997	0.086147	0.091582
Observations	1232	1232	1232

Fig. 5 Coefficient of variation (calculated quarterly)

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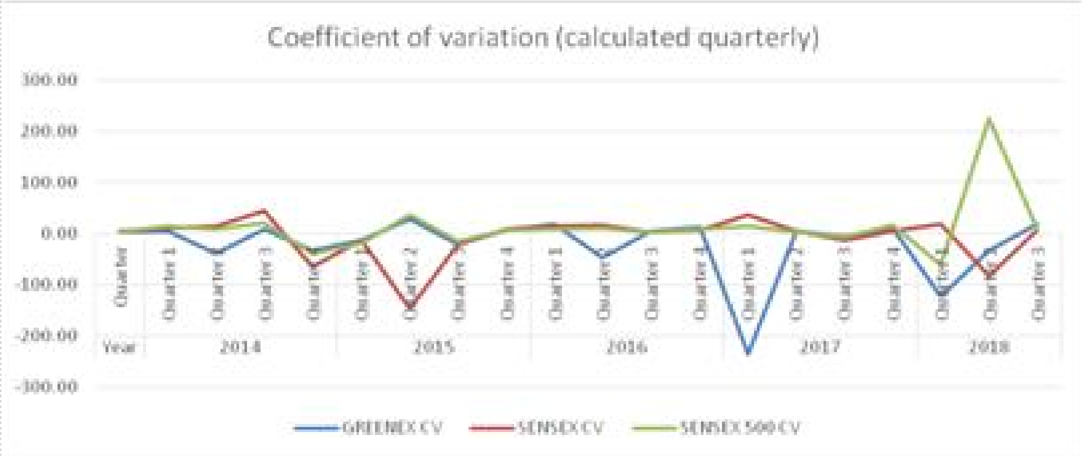

Conclusion

Returns from BSE GREENEX were comparatively more and consistent. Investment in green stocks can provide investors with greater and less volatile returns. By investing in green stocks, the investors can earn more returns along with taking forward the concept of sustainable development. Investing in environmentally committed organisation can provide long run value to its investors.

Business houses are looking ways to reduce their carbon footprints. Going green can help an organisation to build an image in the eyes of investors & customers, minimizing legal action and reducing governmental interference and taking a step for continual existence of mankind.

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