AN EMPIRICAL STUDY OF RISK/RETURN AND VOLATILITY ANALYSIS OF SELECTED ESG RATED COMPANIES OF INDIAN STOCK MARKET

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ABSTRACT

The concept of sustainability has caught a pace during the last few decades, and the emergence of ESG in the year 2005 opened a new platform for the investors to design their portfolios while making socially responsible investments. This paper examines the risk / return and volatility profile of selected ESG rated companies of India. The study has been carried out for 45 SRC's selected from the three major sectors namely: Chemical, Finance, and Automobile sector. The companies under these sectors selected for the study are those companies which are assigned an ESG (Environment, Social, Governance) score and considered as SRC'S according to the Bloomberg rating agency. This paper is conducted over a period of April 2015 to March 2018 and the data used is in the form of daily returns for the particular period. The results indicated that in all the three sectors, companies bear a low risk, giving positive returns. On the contrary, majority of the companies are negatively correlated to market volatility. This study draws two different portfolios out of these three sectors, keeping volatility as the key factor while designing the portfolio. One portfolio can be constructed with companies having volatilities positivelycorrelated with the market and traded when market is bullish and while the other includes those companies having volatilities negatively correlated with the market can be traded when the market is bearish.

The findings will help the investors and fund managers to include and exclude the companies while designing the portfolio for socially responsible investments.

Keywords: Social Responsible Investment (SRI), Socially Responsible Companies (SRC's), ESG (Environment, Social, Governance) Score, Risk, Return.

INTRODUCTION

Socially Responsible Investment strategies are gaining the awareness about environmental stability, social development and adherence to governance standards.

The percieved lack of governance during global financial crisis and increasing global warming threats bought about a consensus towards the important holistic approach of social responsible investments. One of the strategy that broadens the vision of such investment is ESG (Environment, Social, Governance) based investing. It has gradually gained popularity among the responsible investors who are dedicated to the ESG theme while investing.

Identifying and Quantifying the intangible value are the two underlying principle behind ESG based investments. These are possessed by environmental friendly and socially responsible firms voluntarily with their robust governance policies in place

(C. Hariharan and M. Babu, 2018). The ESG score assigned firms are believed to exhibit better risk management based on its parameters, in addition, they create a value for investors having long lasting goals with sustainable business models.

ESG theme is one of the excellent strategy under the broader theme of socially responsible investment for portfolio designing and selection. Environmental, Social and Governance (ESG) theme is an effective portfolio selection strategy under the broader theme of sustainable and

responsible investment (SRI). Fund managers and investors can focus upon firms, with better ESG performance, to generate higher returns with lower company specific risk. Cerulli Associates (2019) report that 83% of active U.S. investment managers say they are embedding ESG criteria into their investment decision making

This strategy has gained popularity among all the global investors whose emphasis is to invest in companies abiding the responsible and sustainable business models. All though the primary motive of each and every investor is to maximize the returns, the underlying drive, behind ESG theme based investing lies in generating returns from such portfolio which trades responsible, and ethical firms thereby minimizing the risk associated with ESG controversies.

The study helps the fund managers and investors to focus on the firms with ESG performance, possessing low risk and high returns. Also the volatility of stocks forms the basis of portfolio designing in order to invest in different situations of market i.e bullish and bearish markets.

LITERATURE REVIEW

An inconsistency in results has been found from the literature about the effectiveness of ESG strategies in order to achieve super financial returns(Talan& Sharma,2019). Giese..et.al (2021), pointed that aggregating environmental, social, and governance pillars into a total ESG rating adds a value in terms of performance and risk.

In an important observation Cin, & Lee (2014) , in their study on Korean firms concluded that a positive relationship exists between the environmental responsibility and financial performance of the firms. In addition , Ortas,et.al(2015) investigated companies' environmental, social, governance (ESG), and financial implications of their commitment to the United Nations Global Compact (UNGC) for the three countries Spain, France, and Japan and found that ESG performance has a significant impact on financial performance for companies that adopted the principles of the UNGC.. On the contrary, Humphrey et. al (2012) explored their study on U.K firms and found that there is no difference in the financial performance of firms which were ranked high or low on ESG parameters. Chelawat and Trivedi(2015) in their study for India concluded that the ESG investments outperform the Non ESG investments giving superior returns and with no difference in risk. Czerwińska & Kaźmierkiewicz. (2015) in their analysis concluded that the companies with higher ESG rating were distinguished by an over-average return rate and lower return rate volatility as well as lower forecasting error in return rates, which is indicated by the standard error parameter (alpha and beta coefficients). Cornell. B(2020) concluded, that companies with high ESG ratings can lead to lower costs of equity capital that encourage investment in green technologies and function as a hedge against climate shocks and unexpected changes in environmental regulation. However, both these benefits come with a cost in the form of lower expected returns for investors. Verheyden et.al (2016) again in their findings concluded that ESG investments are the screened investments and they possess low financial risk and give high returns in comparision to the unscreened investments. Nagy.et.al(2016) applied tilt and momentum strategies for testing the ESG performance and found that both the models outperform the conventional index adding improvements in ESG profile of the portfolio. Loof and Stephen(2019) concluded that higher ESG scores are associated with reduced downside risk of stock returns by the application of VaR model and the Fama-French three factor model, it was found no systematic relationship between ESG and the level of risk-adjusted return. Thus the literature explores that majority of countries show low risk and high positive returns in case of ESG scorer companies.

ESG DISCLOSURE HAS INCREASED IN INDIA

ESG data can offer to mainstream financial analysis a unique tool to assess future company and investment performance. Given the significance of ESG data for financial markets transparency, there is a general consensus about its legitimacy in the financial sector. Despite these trends, the proliferation of ESG ratings and some systemic weaknesses prevent the comprehensive ESG integration into mainstream investing. Federica Doni and Lara Johannsdottir(2019) mentioned that nevertheless, ESG ratings are highly relevant to managers and investors including ESG issues into their decision-making process, therefore, it is important to analyze the main features of ESG ratings, factors and methodology criteria to provide an in depth overview about the different models proposed by the well-known ESG ratings providers. Socially conscious investors practice ESG investing not only for moral or environmental reasons but also because they believe that rewarding these kinds of values will support a company's long-term performance.

PURPOSE OF THE STUDY

With regard to the first aspect of 'ESG', i.e. 'Environment', there have been studies in India using the 'Green ratings' of companies (for example, Gupta and Goldar 2005) and its correlation with the company's goodwill analyzed by

Srinivasan and Singh (2010).While the former study reported negative abnormal returns in respect of companies with low rating, the latter reported that Indian stock market does not attach importance to such'short-term' environmental assessment captured by the rating. India being an important emerging market economy, it is all the more imperative for all the stakeholders of the stock market to know whether investment in sustainable companies (that comprise the sustainability index) provide returns that are superior or inferior or at par compared with the returns of the broad market. It is also equally vital to know whether they are riskier compared with the broad market.

The purpose of this study is to provide business leaders with a context for investment in socially responsible companies that extends beyond the quantitative financial drivers of making a decision to invest in socially responsible initiatives. This study will explore a selection of firms that engage in socially responsible business practices and analyse the risk-return performance of such stocks.

STATEMENT OF PROBLEM

Investing in stock market is not an easy task. Although many investors are risk averse but getting high returns with low risk is the first expectation of majority of investors while investing in the stock market. Before investing in any stock the investor keeps in mind the past returns, market value, EPS, goodwill, brand image and many more points of the particular company. The decision making becomes more difficult when the aim of investing moves one step forward i.e with high returns and low risk expectations the investment should be ethical. When the investor, while investing also keeps in mind that his/her investment proves fruitful for the society as a whole in terms of environmental, social and governance issues he or she abandons the companies from their portfolio which are not ethically working although those companies give high returns. This paper makes the attempt to analyse the risk, return and the volatility of such SRC's which work ethically and the portfolios for two different periods , when the market is bullish and bearish are provided. The findings will help such investors in decision making while designing their portfolio who wants to invest ethically.

OBJECTIVES OF THE STUDY

1. To undertake risk and return analysis of selected ESG scorer sectors of Indian stock market.
2. To analyse the relationship of volatility of SRC's with respect to the volatility of BSE.
3. To motivate the investors for thinking ethically before investing by putting forward some of the selected companies which can be added in investors portfolio.

RESEARCH METHODOLOGY

Research Design: Descriptive research is used to draw inferences about the possible relationships among the variables. Based on the research objectives, descriptive research has been adopted. Along with the above research framework, 'Analytical research' technique is also adopted in this study. Analytical research is generally designed to analyze the available information and make a critical evaluation.

Source of Data: This study is purely based on secondary data in which daily share price of 45 selected SRC's stocks of India, are collected from 1st April 2015 to 31st March 2018 from BSE India.

Statistical Tools For Data Analysis:

Rate of return : It is the actual return that an investor receives by holding a security during a certain period and it is measured as:

R = Dt + (Pt-Pt-1)/

Pt-1Where:

R = Rate of return.

Pt = Price of the security at time 't' i.e., at the end of holding period.

Pt-1 = Price of the security at time 't-1' i.e., at the beginning of the holding period.

Dt = Dividend or Income receivable from the security at time 't'.

Standard deviation(S.D): S.D measures by how much returns deviate from the average returns. It is the square root of the average of squares of deviations of the observed returns from their expected value of return. It is measured as:

$$\sigma = \sqrt{\frac{\sum(x_i - \mu)^2}{N}}$$

Where:

σ = population standard deviation

N = the size of the population

x_i = each value from the population

μ = the population mean

DATA ANALYSIS AND INTERPRETATION

Under Auto sector 10 SRC's were selected for the study and following were the findings:

- All the companies under this sector have given the positive average returns.
- Ashok leyland stands at 1st position and has given the maximum returns.
- Bosch ltd ranks 10th with the minimum average returns.
- The standard deviation of Rasandik engineering ltd. is maximum, it means it is the most risk possessing company but it also stands 2nd in terms of avg. return that means it holds a strong position in the market.
- The beta of four companies (Rank 1, rank 3, rank 4 and rank 2) are positive and less than 1 indicates that their security price are theoretically less volatile than the market. Whereas the companies showing negative beta value have an inverse relationship with the market.

Table 1 : SRC'c of Automobile Sector

Company Name	Average Returns	Rank	Std. Deviation	Rank	Beta	Rank
	(Avg. ret.)	(Avg. ret.)	(S.D.)	(S.D.)	(β)	(β)
Ashok Leyland Ltd.	0.01168938	1	0.00042077	4	0.022514624	1
Bajaj Auto Ltd.	0.000609149	6	0.01463554	8	-0.004708083	7
Bosch Ltd.	0.000320355	10	0.01641697	6	-0.00095341	6
Eicher Motor Ltd.	0.000964498	4	0.0188709	5	-0.17987464	10
Hero Motocorp Ltd.	0.000594752	7	0.014433263	9	-0.012949009	3
Maruti Suzuki India Ltd.	0.001346033	3	0.014892346	7	-0.005393146	8
Mother Son Sumi Systems Ltd.	0.000755857	5	0.014892346	2	-0.008191747	4
SKF India Ltd.	0.000407648	9	0.013597591	10	-0.017536272	9
Tata Motors Ltd.	0.00054656	8	0.021145041	3	-0.00001111	5

Table 2 : SRC's of Chemical sector

Company name	Average returns	Rank	Std. deviation	Rank	Beta	Rank
	(Avg.Ret)	(Avg.Ret)	(S.D)	(S.D)	(β)	(β)
Alkylamines Chemicals Ltd.	0.001182801	18	0.024841424	21	0.011581373	9
Alufluoride Ltd.	0.003662164	4	0.04076524	7	0.011712899	7
Avon Lifesciences Ltd.	-0.000548451	24	0.042464632	6	0.011685773	8
Cochin Minerals And Rutile Ltd.	0.000992032	19	0.036428286	12	0.036754475	2
Harleth	0.001223604	17	0.033460531	17	0.019597111	4
Insilco Ltd.	0.000554257	23	0.02504554	20	-0.045362479	23
Jayshree Chemicals Ltd.	0.001850731	13	0.048001474	2	0.049606318	1
Jyoti Resins & Adhesives Ltd.	0.003334339	5	0.037889064	10	-0.009362124	18
Keerthi Industries Ltd.	0.002094644	10	0.031651377	18	-0.009493715	19
Kilburn Chemicals Ltd.	0.00373563	3	0.094155844	1	0.014335094	6
Laffans Petrochemicals Ltd.	0.002002971	12	0.034166244	15	-0.052551264	24
Lime chemicals	0.00390956	1	0.019242526	23	0.000203545	13
Mysore Petro Chemicals Ltd.	0.002056927	11	0.038770026	8	-0.011182876	20
Organic Coatings Ltd.	0.000905751	21	0.03821728	9	0.003858312	10
Punjab Alkalies and Chemicals Ltd.	0.001529646	15	0.03663713	11	-0.014128701	21
Paushak Ltd.	0.002254687	8	0.035383318	14	0.015830702	5
Pidilite Industries Ltd.	0.000695764	22	0.014194586	24	0.003228509	11
Refex Industries Ltd.	0.001408327	16	0.044243901	5	-0.006611354	16
Resonance Specialties Ltd.	0.001754796	14	0.045281934	3	-0.009237109	17

Supreme petrochemicals Ltd.	0.002579393	7	0.027286723	19	-0.003453875	14
Tanfac Industries Ltd.	0.003821535	2	0.044646916	4	0.032900677	3
TGV Sraac Ltd.	0.002748515	6	0.036023153	13	-0.00570667	15
Tuticorin Alkali Chemicals.	0.002144774	9	0.033803963	16	-0.042000713	22
UPL Limited	0.00095152	20	0.020707753	22	0.00187142	12

In Chemical sector 24 SRC's were selected for the study and following were the findings:

- The average return of Lime chemicals is maximum which stands at the 1st position followed by Tanfac India ltd with the 2nd position.
- Avon life ltd gives the least returns holding the 24th or the last position among all the SRC's.
- The standard deviation of Kilburn ltd. is maximum holding the 1st rank but on the other hand it also holds a very good position (rank 3) in terms of average returns.
- Lime chemicals is observed to give the best result with a minimum standard deviation on rank 23 and maximum returns proves itself an excellent company to invest in.
- Pidilite industries possess the least risk with standard deviation on rank 24 but also in terms of return it is the second least returns giving company.
- The beta value of 13 companies are positive and also less than one means the security prices of these companies are less volatile than the volatility of the market as a whole.
- The rest of the companies shows the negative beta value that means their security prices have an inverse relationship with the market.

Table 3 : SRC's of Finance sector

Company	Average returns	Rank	std. deviation	Rank	Beta	Rank
	(Avg.Ret)	(Avg.Ret)	(S.D)	(S.D)	(β)	(β)
Bajaj Finserv Ltd.	0.001923023	3	0.019137385	9	-0.011703732	8
Bajaj Finance Ltd.	0.002294416	2	0.021275626	6	-0.002019225	6
L&T Finance Holdings Ltd.	0.001486439	4	0.020353813	7	0.003881583	4
LIC Housing Finance Ltd.	0.00488235	1	0.018820291	10	-0.017989156	10
Oracle Financial Services.	0.00044124	6	0.013305561	11	0.007078703	3
Power Finance Corporation.	-7.13305E-05	9	0.022978035	3	0.010958945	1

PMC Fincorp Ltd.	-0.004231683	11	0.043759407	1	-0.092526896	11
REC Ltd.	0.000314111	8	0.023154242	2	-0.001003975	5
Shriram City Union Finance.	0.0003468	7	0.02004244	8	-0.017387748	9
Shriram Transport finance.	0.000809187	5	0.021979057	5	-0.003906698	7
Tilak Ventures Ltd.	-0.004228655	10	0.022364354	4	0.008577272	2

In Finance Sector 11 SRC's were selected for the study and following were the findings:

- LIC housing finance ltd is the company observed to give the maximum returns holding the 1st rank among all the other companies and also with minimum standard deviation at 10th position i.e, a company with low risk and higher returns and an excellent company for investors to invest in, but on the contrary when beta value is observed it holds the 10th position with negative beta value that means it has an inverse relationship with respect to the market movements.
- OFSS ranks 6th in terms of giving return but its lowest risk possessing company with minimum standard deviation and can be a good company to invest for those who are low risk takers. Also the volatility of OFSS is at rank 3 and positive that means its security value moves with the market as a whole.
- PMC finance is a company with lowest returns(negative) ranking 11 with highest risk ranking 1.The negative beta value again indicate that its price movements are opposite to the market price movements. Such companies are generally not advisable for the investors to invest in because investors are at highest risk and get lowest return.

SUMMARY AND CONCLUSION

This study has been conducted for risk and return analysis of certain Indian SRC's.

Three sectors namely Automobile, Finance and Chemical sectors were undertaken for the study. Those companies which are assigned an ESG score by the Bloomberg rating agency were included in the study. The sample of 45 SRC's was selected. For the analysis, daily returns of the SRC's were collected for a period of 3 years from April 2015 to March 2018. Statistical tools used for the risk and return analysis are Average return, standard deviation and beta. Ranks were assigned to each of the analytical value for the ease to interpret the results. This is a descriptive research and following were the findings:

About 91% of the companies gave good positive returns and 100% companies possess a very low risk. This result links in line with the existing literature on the ESG scores

Companies. On the contrary, majority of the companies are negatively correlated to market volatility. This study helps to draw two different portfolios out of these three sectors, keeping volatility as the key factor while designing the portfolio. One portfolio can be constructed with companies having volatilities positively correlated with the market and traded when market is bullish and while the other includes those companies having volatilities negatively correlated with the market can be traded when the market is bearish.

When an investor takes decision while designing its portfolio and select the companies for investment, one examines the factors which are usually considered important (EPS, market capital, average return, brand value, goodwill etc). In addition one should also think a step forward and also broaden his/her vision while deciding to include any company by keeping in view the ESG score assigned by the rating agencies being a responsible citizen and showing concern towards the environmental, social and governance factors of the nation. SRC's give this opportunity to each investor to perform his ethical duties towards the nation.

LIMITATIONS OF THE STUDY

1. The study is limited up to three sectors.
2. Different rating agencies have different methodologies of assigning ESG score to any company. Some assign

scores while some assign grades. ESG scores assignment has no universal methodology. It is possible that one rating agency includes a company as SRC in its list but another one does not. This study is limited to the SRC's mentioned in the Bloomberg rating agency SRC list based on the ESG scores.

FUTURE SCOPE

This study is limited up to three sectors while in further research can be done on other sectors. Also the SRC's mentioned in the study are the companies that are assigned an ESG score by Bloomberg rating agency, this scope can be widened by the research on the SRC's listed by different rating agencies.

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