



IMPACT OF COVID 19 PANDEMIC ON E.S.G. INDICES IN INDIA

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Abstract: - ESG is similar concept like CSR corporate social responsibility wherein ESG practices include corporate practices related to Environment, Social and Governance and disclosure of ESG by the companies. Major stock exchanges worldwide have begun constructing ESG based indices. Mutual funds in India have introduced ESG based schemes for the investors for good long term returns. This research investigates the impact of covid 19 pandemic on ESG. For this research I have selected 3 ESG indices that are BSE Greenex, BSE Carbonex and BSE 100 ESG indices of Bombay stock exchange for the study. From this study we are going to find out the impact of covid 19 pandemic on the ESG indices and how did it got affected how did it perform after the covid 19 pandemic is there any change on ESG indices after the covid 19 pandemic. For this study we are going to perform descriptive statistics and paired t test. for this research the data we are going to collect are pre covid 1 October 2019 to 24 March 2020, during covid period 25 March 2020 to 31 October 2021 and post covid period 1 November 2021 to 31 March 2022

Keywords: - ESG, ESG indices, Covid 19 pandemic, BSE Greenex, BSE Carbonex, BSE 100

Introduction: -

ESG indices refer to three key factors in measuring the impact of investment: Environmental, Social, and (corporate) Governance. ESG criteria help investors better assess a company's future financial performance, both in terms of return on investment and in terms of risk. Stock exchanges in the world gives attention to the market news like the scam of Harshad Mehta has affected the stock market and even the last year Russia Ukraine war has affected the stock market. All the financial market responds to the negative news for the world whether that crises are directly associated with the financial sector or it has any indirect impact of it. Not only did the COVID-19 epidemic impair people's health, but it also had a detrimental influence on financial markets and enterprises. The government's enforcement of curfews, lockdowns, travel bans, and the closure of industries, retail stores, trades, and enterprises has shaken all economies. Global financial markets have become very turbulent as a result of the COVID-19 epidemic since December 2019. There are many reports that COVID-19 has a significant impact on all the global stock exchanges. Similar discoveries are predicted in the Indian financial industry. However, with the mindset of a risk-averse investor, the current study seeks to investigate an investing path that may bring some relief during this stressful period. A type of sustainable investment known as environmental, social, and governance (ESG) investing takes a company's governance, social, and environmental aspects into account. A company's long-term viability and possible social effect are frequently assessed using ESG considerations. The concept of ESG investing was first introduced by social activists in the 1970s, who urged investors to take the social and environmental effects of their decisions into account. ESG investment started to gain popularity in the 1990s among institutional investors, including endowments and pension funds. A variety of reasons, including as

the growing awareness of climate change, the growing desire for corporate transparency, and the development of new ESG data and analytical tools, contributed to the continuous growth of ESG investment in the 2000s. Trillions of dollars are invested in ESG funds today, making ESG investing a popular investment technique. The majority of investors now take ESG concerns into account, and many businesses are already integrating ESG considerations into their business strategy. ESG investment has a bright future. The growing awareness of the potential hazards and benefits linked to environmental, social, and governance (ESG) aspects is expected to propel the growth of ESG investment.

The environmental, social and governance (ESG) indices were constant and their performance was good. The purpose of this research paper is to get to know that the ESG indices were really did not get impacted by the COVID-19 or there was some effect on it. In this expansive context, the research aims to unravel the performance of ESG indices during the tumultuous period marked by the COVID-19 pandemic. By doing so, the study endeavors to offer nuanced insights into the resilience and efficacy of ESG investing, shedding light on its potential as a beacon of stability and sustainability in the face of unprecedented global challenges

Literature Review:-

The term “socially responsible investing” itself has been evolving into something akin to ESG investing.⁴ However, acceptance of ESG investing had been slow, largely “because it was historically associated with exclusionary investing (i.e., negative screens) rather than with positive or best-in-class investing” (Caplan, September 2013). There have been numerous studies on establishing a link between corporate financial performance and corporate social performance and the basis of comparison is the ESG ratings. (Fratantuono, 1992) in their study classified 49 companies as high, medium or low environmental performers based on reputation indices published by Council of Economic Priorities (CEP). They concluded that environmental performance these firms is significantly correlated with financial performance. Most of the studies have found a positive relationship between ESG and firm value which would help investors make a calculated choice on their investments. For instance, (Samuel M. Hartzmark, December 2019) provide strong evidence that investors attract value sustainability. They could collect experimental evidence that sustainability warranties a better future performance. Wong et al. (2021) examine the impact of ESG certification on Malaysian firms. The analysis exhibits that ESG certification lower's a firm's cost of capital. It also confirms that the stakeholders benefit from firms pursuing ESG agenda.

There have been studies which have observed that ESG investing may not lead to any superior portfolio performance. Auer & Schuhmacher (2016) analyzed the performance of socially (ir)responsible investments in the Asia-Pacific region, the United States and Europe. They observed that in the Asia-Pacific region and in the United States, investors concentrating on ethical utility derived from their portfolio choice can follow an ESG-based investment style and still obtain a performance similar to the broad market. However, the investors in Europe tend to pay a price for socially responsible investing (depending on the ESG criterion they have selected). As per the Kiplinger's Domini National Public Opinion Poll (ESG Investing in gaining traction, 2021), it says that majority of the investors chose their investments based on an organization's commitment towards ESG principles. As per their survey, more than half of the respondents were willing to sacrifice a part of their performance on their investment to achieve an ESG goal. A study by Luc Renneboog, professor of corporate finance at Tilburg University, Jenko ter Horst, professor of finance at Tias Nimbas Business School, and Chendi Zhang, professor of finance at Warwick Business School, published in 2008 in the Journal of Banking & Finance, (Cem Mus ˇ ite P ˇ remýšlet, 2017), concludes that investors are prepared to accept lower returns in exchange of socially responsible investing factor.

According to major investment banking firms like Credit Suisse, Morgan Stanley, Ernst & Young, etc. Millennials have a distinct perception when it relates to investments. (Credit Suisse, 2018). When compared to a non-millennial investor, millennials are incorporating sustainability in general, and not just into investment decisions. In terms of investments, this distinct millennial philosophy means that they do not just care about financial returns.

Millennials want to see what impact their investments have and how they can do good for society or the environment. (Morgan Stanley, 2017).

This study contributes to the existing literature by providing empirical evidence on the volatility of ESG stocks during the COVID-19 pandemic. The findings suggest that, in line with previous research on green and sustainable equities during the financial crisis, ESG stocks exhibit a degree of resilience and stability during periods of market turbulence.

The research highlights the importance of considering environmental, social, and governance factors in investment decisions, especially in times of crisis. The implementation of government measures such as curfews, lockdowns, and travel bans has significantly impacted traditional industries and businesses, leading to heightened market volatility. In contrast, ESG stocks, with their focus on sustainability and responsible practices, seem to weather such storms more effectively.

The use of the GARCH model in analyzing volatility provides a robust methodology for assessing the impact of the pandemic on the selected ESG indices, namely BSE 100 ESG Index, Greenex, and Carbonex. The study's quantitative approach enhances the credibility of the findings and contributes valuable insights for investors seeking to navigate uncertain market conditions. Manivannan Babu, A. Antony Lourdesraj, C. Hariharan, J. Gayathri, CS Karishma Butani, Chinnadurai Kathiravan these were the Authors for the research paper named "Impact of covid-19 pandemic on Environment, Social, and Governance Index in India"

Research Methodology: -

The BSE of India has successfully launched three sustainable indices: BSE Greenex, BSE Carbonex and BSE 100 ESG Index. Daily observation or the price of this index were taken from investing India website. The prices data has been collected for pre COVID-19 1 October 2019 to 24 March 2020, during COVID-19 period 25 March 2020 to 31 October 2021 and post COVID-19 period 1 November 2021 to 31 March 2022 we would be calculating the daily change price on basis of the previous day price. On that data we will be going to perform the descriptive statistics to get the mean, standard deviation. Which will help to get the result that the change is more or less before the COVID-19 it has increased or not during the COVID-19 and post COVID-19 is there any change

Objective: -

Below are the objectives which are going to be fulfilled by the research which is going to be carried out

1. The purpose of this research is to know the impact of COVID-19 pandemic on the volatility of Indian sustainable indices
2. To analyse any change on the ESG indices after the COVID-19 pandemic

Data Analysis

The data collected for this study was from Research papers and websites. The data was collected from Investing.com. We shortlisted three ESG indices namely BSE 100 ESG, BSE Greenex ESG and BSE Carbonex from the BSE Platform available ESG indices because BSE 100 ESG would be giving an exposure of 100 companies and BSE Carbonex was taken because it is the first index of its kind in India, identifies companies' commitment to mitigating risks arising from climate change. BSE Greenex was taken as it focuses on companies with strong energy efficiency performance and it consist of 25 green companies in terms of greenhouse gas (GHG) emissions, market cap, and liquidity. Hence our sample size is 3. We first evaluated the descriptive data and then applied paired sample T-test to analyze the impact of Covid-19 pandemic on ESG indices. Paired sample T-test is conducted when to determine whether the mean difference between two sets of observations is zero. It would be an apt tool for our study because our study involves measuring the same variables before and after an event (COVID19), making the data naturally paired and had limited resources and access to a relatively small sample size, and paired t-tests offer better statistical power when dealing with paired data.

Table 1:- PRE COVID 19

	BSE 100 ESG	BSE Greenex	BSE Carbonex
Mean	-0.33983	-5.04362	-3.78664
Standard Error	0.255319	3.592534	2.587432
Median	0.055	-0.895	-0.755
Mode	1.07	#N/A	#N/A
Standard Deviation	2.749867	38.69277	27.86749
Sample Variance	7.561767	1497.131	776.5972
Kurtosis	7.581828	8.631192	7.930253
Skewness	-1.92052	-2.02692	-1.92817
Range	20.49	300.52	214.11
Minimum	-13.5	-211.54	-141.31
Maximum	6.99	88.98	72.8
Sum	-39.42	-585.06	-439.25
Count	116	116	116

In the above table you will be able to see that the mean of all the 3 ESG indices are negative so you can see that the negative (Minimum) are more than the positive (Maximum) so the ESG indices have not given returns but have not given more losses the time frame taken is 1 October 2019 to 20 March 2020 if we have taken the time period longer it might have given good returns.

Table 2:- DURING COVID 19

	BSE 100 ESG	BSE Greenex	BSE Carbonex
Mean	0.3952	6.221	3.712225
Standard Error	0.130834	1.983649	1.294968
Median	0.54	8.485	5.245
Mode	0.25	18.45	22.88
Standard Deviation	2.616676	39.67299	25.89936
Sample Variance	6.846993	1573.946	670.7767
Kurtosis	6.784612	5.386568	8.515268
Skewness	-0.98256	-0.84707	-1.14165
Range	28.4	410.52	297.65
Minimum	-17.44	-245.98	-184.15
Maximum	10.96	164.54	113.5
Sum	158.08	2488.4	1484.89
Count	400	400	400

In the above table you would be able to see that the mean of all the three indices are positive the minimum range is on a higher side but the number of days is lower and the maximum range is lower than the minimum but the no of days' maximum is positive so ESG are giving positive return during the COVID 19 the time frame for this table is the longest time frame which is 21 March 2020 to 31 October 2021.

Table 3 :- POST COVID 19

	BSE 100 ESG	BSE Greenex	BSE Carbonex
Mean	-0.02553	0.195631	-0.17194
Standard Error	0.349959	5.990546	3.478077
Median	0.04	0.36	1.1
Mode	4.53	#N/A	#N/A
Standard Deviation	3.551692	60.7974	35.29862
Sample Variance	12.61452	3696.324	1245.993
Kurtosis	1.965033	1.514489	1.857109
Skewness	-0.79628	-0.79185	-0.82011
Range	22.82	354.4	220.12
Minimum	-14.22	-221.37	-138.42
Maximum	8.6	133.03	81.7
Sum	-2.63	20.15	-17.71
Count	103	103	103

In the above table you can see that the mean of 2 ESG indices are negative and 1 ESG is positive the minimum range is higher than the maximum but the maximum range is more in no of days for the BSE GREENEX so the mean of it is positive and the other 2 ESG the minimum Range is more for the no of days so there the mean is negative.

Paired T Test

Note: For paired T Test the total no of variables should be same so we have taken same number with post covid and pre covid. For post covid total number of variables was 103 and pre covid was 116 so pre covid variables has been reduced to 103

Null hypotheses: There is no impact of Covid-19 event on the performance of BSE 100 Index

Hypothesis: There is an impact of Covid-19 event on the performance of BSE 100 Index

Table 1:

T-Test: Paired Two Sample for Means		
BSE 100 ESG	<i>Post Covid</i>	<i>Pre Covid</i>
Mean	289.7209	186.8588
Variance	65.95058	29.13155
Observations	104	104
Pearson Correlation	-0.30184	
Hypothesized Mean Difference	0	
Df	103	
t Stat	95.14983	

P(T<=t) one-tail	1.7E-102	
t Critical one-tail	1.659782	
P(T<=t) two-tail	3.4E-102	
t Critical two-tail	1.983264	

The t-statistic is very large, and the p-values are extremely small (close to zero). This suggests strong evidence against the null hypothesis (that there is no difference between the means). The negative correlation indicates that there is a decrease in the mean value from Pre Covid to Post Covid. With p-values much smaller than conventional significance levels (e.g., 0.05), you would typically reject the null hypothesis. There is strong evidence to suggest that there is a significant difference between the means of the two conditions. The t-statistic being much larger than the critical values further supports the rejection of the null hypothesis.

In summary, the data provides strong evidence to conclude that there is a significant difference in means between the BSE 100 ESG group before and after the Covid period. The negative correlation suggests that, on average, the values decreased from Pre Covid to Post Covid.

Table 2:

Null hypotheses: There is no impact of Covid-19 event on the performance of BSE Greenex

Hypothesis: There is an impact of Covid-19 event on the performance of BSE Greenex

T-Test: Paired Two Sample for Means		
BSE Greenex	<i>Post Covid</i>	<i>Pre Covid</i>
Mean	4554.848077	2781.943
Variance	18875.19382	5068.29
Observations	104	104
Pearson Correlation	-0.211058658	
Hypothesized Mean Difference	0	
Df	103	
t Stat	107.910674	
P(T<=t) one-tail	4.5064E-108	
t Critical one-tail	1.659782273	
P(T<=t) two-tail	9.0129E-108	
t Critical two-tail	1.983264145	

The t-statistic is very large, and the p-values are extremely small (close to zero). This suggests strong evidence against the null hypothesis (that there is no difference between the means). The negative correlation indicates that, on average, the values of BSE Greenex decreased from Pre Covid to Post Covid. With p-values much smaller than conventional significance levels (e.g., 0.05), you would typically reject the null hypothesis. There is strong evidence to suggest that there is a significant difference between the means of the two conditions. The t-statistic being much larger than the critical values further supports the rejection of the null hypothesis.

In summary, the data provides strong evidence to conclude that there is a significant difference in means between the BSE Greenex group before and after the Covid period. The negative correlation suggests that, on average, the values decreased from Pre Covid to Post Covid.

Table 3:

Null hypotheses: There is no impact of Covid-19 event on the performance of BSE Carbonex

Hypothesis: There is an impact of Covid-19 event on the performance of BSE Carbonex

T-Test: Paired Two Sample for Means		
BSE Carbonex	<i>Post Covid</i>	<i>Pre Covid</i>
Mean	2851.921	1939.307
Variance	6580.29	2347.428
Observations	104	104
Pearson Correlation	-0.32265	
Hypothesized Mean Difference	0	
Df	103	
t Stat	86.9235	
P(T<=t) one-tail	1.67E-98	
t Critical one-tail	1.659782	
P(T<=t) two-tail	3.35E-98	
t Critical two-tail	1.983264	

The t-statistic is very large, and the p-values are extremely small (close to zero). This suggests strong evidence against the null hypothesis (that there is no difference between the means). The negative correlation indicates that, on average, the values of BSE Carbonex decreased from Pre Covid to Post Covid. With p-values much smaller than conventional significance levels (e.g., 0.05), you would typically reject the null hypothesis. There is strong evidence to suggest that there is a significant difference between the means of the two conditions. The t-statistic being much larger than the critical values further supports the rejection of the null hypothesis.

In summary, the data provides strong evidence to conclude that there is a significant difference in means between the BSE Carbonex group before and after the Covid period. The negative correlation suggests that, on average, the values decreased from Pre Covid to Post Covid.

Summary and Conclusion:-

Financial markets are extremely susceptible to market crisis regardless of whether they are directly related to the financial world or sector or have any indirect impact on it like the Russia Ukraine war or corona virus. Thus the research study utilizes Descriptive statistics to examine the how the indices have affected and to what range the sample indexes throughout the COVID-19 Pandemic.

The study compares the impact of COVID-19 over the volatility of returns from sustainable indices (i.e. Greenex and Carbonex BSE 100 ESG). The results revealed that the daily returns of sample indices were volatile, throughout the COVID-19 Pandemic but they gave a positive return to the investor during the COVID 19 and in the pre and post COVID 19 the volatility is there but there were negative returns. The standard deviation for BSE 100 ESG and BSE Carbonex were in range for Pre, Post and During covid-19 but for Bse Greenex for during Covid-19 it has given high standard deviation which means that it has given wild moves in both directions. From the paired T test we get to know that the whether the mean difference between two sets of observations is not zero for all the three Indices. The highest standard deviation is of BSE Greenex and lowest is BSE Carbonex. From the above test performed we get to know there was impact on ESG indices but the impact was less but during the covid-19 period has given high returns.

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