Pre and Present Scenario of Sectoral Indices due to outbreak of novel Coronavirus Evidences from BSE India

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Abstract: The study aims to examine the scenario of the S&P BSE and its major sectors before outbreak of novel corona virus and also the current performance of it. There is no doubt that the whole world has been affected badly; but here how the developing countries like India fighting against the COVID 19 and reconstructing itself. By using the simple statistical methods try to find the relationship between average returns, standard deviation, correlation and beta generated separately in order to examine the effect of COVID-19 on a stock market. The study identifies that all sectors were adversely affected apart from Health Care and IT sector due to a great demand for those during lockdown and after.

Key Words: coronavirus, BSE, Impact, Pre & Present affects.

Introduction

All over the world people were getting the results as like their efforts but everything was changed rapidly due to outbreak of novel coronavirus in the Wuhan city of China in December 2019. It has spread across the world and disturbed the economies of the developed, developing and underdeveloped countries. Apart from pharmaceutical industry, all are badly beaten by covid-19. Stock market will also act as a barometer to measure the growing rate of economy; by considering the major indices like S&P BSE and its sectorial indices an attempt is made to examine the volatility before and current situation.Many of the industries were affected due to outbreak of covid-19 here an importance is given to all major sectors to identify the changes taken in the different indices. So far 19.3 million people are infected in the world out of which 11.7 million people were recovered globally. In Indian context 2.09 million people were affected out of which 1.43 million people were recovered. India stands at the 3rd position in infected and mortalities rate globally.

Even though researches have been taken COVID-19 as a base but it does not cover complete indices? This gap motivated us to check the comparative performance before and after outbreak of coronavirus. The Indian stock market was inversely reacting to the cases confirmed in the country day by day. As increasing in the number of cases the downfall of indices were also started.

Statement of the Problem:

Stock market is also like one of the key element of measuring the performance of the economic development of the country. Since investment in stock market will goes with a wave of economic flow, the difficult times like pandemic disease Covid-19 has troubled the whole world an attempt to measure the changes occurred in the Indian market like BSE with its sectoral indices were considered to measure the risk and return and if any existence of volatility in the returns during the study period.

Objectives of the Study:

- To calculate risk and return of S&P BSE and its sectoral indices during pre-crisis period and present period.
- To measure the correlation between the sectoral indices with S&P BSE

Literature Review

Alam & Chavali, (2020), investigates the impact of lockdown period caused by the COVID-19 on the Indian stock market by adopting an event study methodology. For the purpose of study 31 listed companies of BSE were taken as a sample by considering pre and present lockdown period from 24 February to 17 April, 2020. Average abnormal returns were calculated for both periods where results of the study confirm that lockdown has a positive impact on the stock market.

Ali & Afzal, (2014), has analyzed on global financial crisis started from USA which was spread all over the world and adversely affects financial sectors of developed as well as developing countries. The daily data from January 1, 2003 to August 31, 2010 were taken for KSE-100 and BSE-100 to check the persistent of volatility clustering in the market. For an analysis EGARCH model were applied and concludes that Indian stock market has a greater impact than the Pakistani stock market being Indian economy is comparatively big.

Aravind & Manojkrishnan, (2020), examined the impact COVID-19 on leading pharmaceuticals stocks listed in NSE, India. Due to a medical emergency apart from all sectors chances are more for Pharma sector to outperform during the Covid-19 crisis period. The top 10 Pharma companies were selected for the study along with the Nifty index. Daily returns, average abnormal returns and beta coefficient were computed for pre-crisis and Covid-19 crisis period. The outcome of the study suggested that the profit margin of Indian pharmaceutical companies is declined because many companies largely depend upon raw material from China and suggests that backward integration and investment in R&D plays a vital role in sustaining a long run.

Mazur et al., (2020), investigates the US stock market performance due to impact of Covid-19 by considering monthly stock return and return volatility for March 2020 from S&P 1500 firms. There was a cumulative of 26% reduction in the Dow Jones Industrial Average in four days which was remembering on October 28-29, 1929 DJIA declined by 24.5% and in October 19, 1987 declined by 22.6%. The study observed that highest level of volatility in crude petroleum sector and then followed by entertainment and hospitality industry. The US stock market witnessed Black Monday twice (9^{th}& 16 March, 2020) and Black Thursday (12 March, 2020) because of panic selling.

Njiforti, Peter, (2015), investigated the impact of 2007/2008 global financial crisis on the Nigerian market by considering monthly time series data from January 2006 to December 2009. By adopting Vector Error Correction model study found that global financial crisis adversely and significantly affected the Nigerian capital market in the short run as well as long run.

Data and Methodology

To examine the impact of Covid-19 on the Indian stock market S&P BSE Index and its sectoral indices were selected for the study from 1/08/2019 to 30/01/2020 as a pre-crisis period and from 31/01/2020 to 31/07/2020 present Covid-19 crisis. The first case breakout in India on 30/01/2020 at Kerala, but there was no significant increase in the spreading. Later on it took momentum from the March end where India declare its first lockdown on 24/03/2020for a period of 21 days and again on 14/04/2020 the lockdown 2.0 extended up to 3/05/2020 further lockdown 3.0 extends up to 17/05/2020 finally the lockdown 4.0 declared up to 31/05/2020. Even during the lock down period also the cases were reported with a growing numbers. Unlock 1.0 and 2.0 started in the month of June and July but still no vaccine has launched till date for the virus. Hence the above period was selected as a pre-crisis period and present-crisis period. The main purpose of the study is to measure the performance of S&P BSE and its sectors during pre-crisis period and present crisis period; and to know the trends of the indices due to impact of corona virus.

The intention or motive of all investor is to earn the profit by reducing the risk in the market, but it is always not possible because markets are uncertain in nature. Here simple methods are used like log returns to know the average returns by using the formula: for n^{th} day = ln [Price on n^{th} day/Price on $(n-1)^{th}$ day], standard deviation to know the risk level with respect to returns by using the formula:

$\sigma_i = \sqrt{\{\sum(i- i)\ 2\ /n\}}$.

Alpha and beta are calculated by using simple linear regression statistics which is used to study the volatility of stocks.

Beta = Variance/Covariance

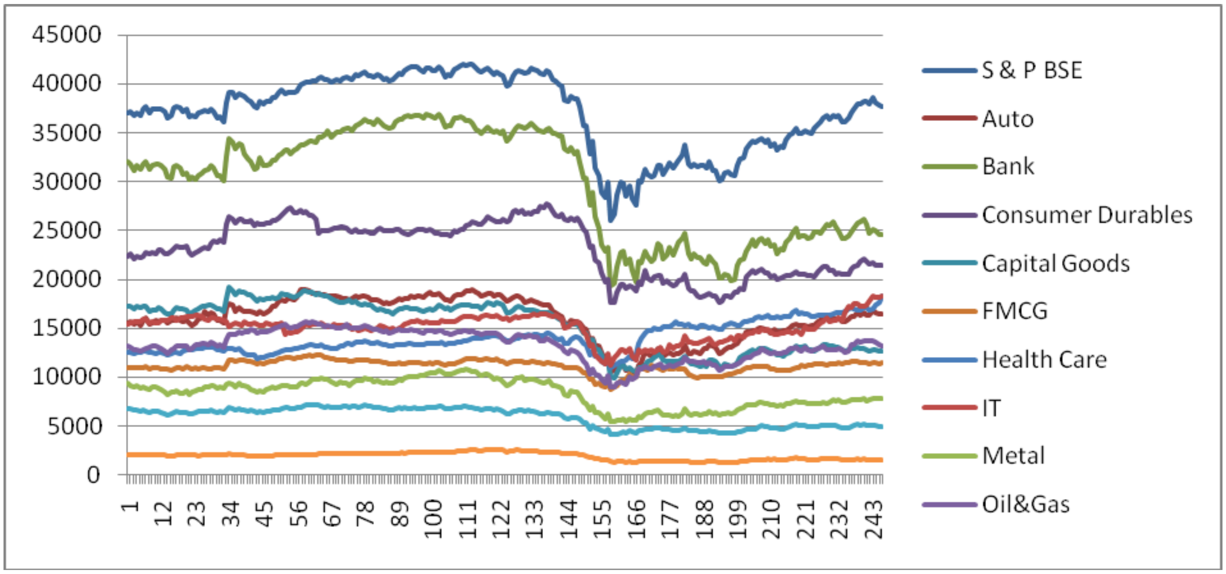
Correlation analysis is used to find the relationship between sectoral indices with the S&P BSE index. The following formula is used.

$$r = \frac{n(\sum xy) - (\sum x)(\sum y)}{\sqrt{[n(\sum x^2) - (\sum x)^2]\,[n(\sum y^2) - (\sum y)^2]}}$$

Where x= returns of spectral indices

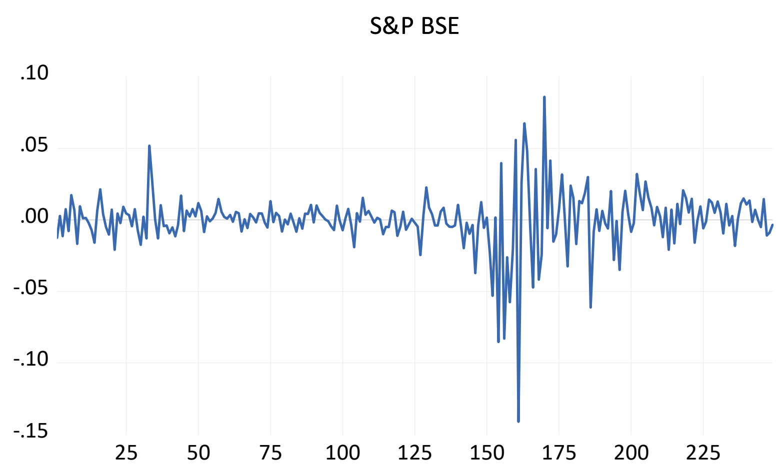
y= returns of the index

Results and Discussion



Source: BSE website

Graph showing the comparison between S&P BSE and its Sectoral Indices for a period between 1/08/2019 to 31/7/2020. It is very easy to observe that there was a deep fall in S&P BSE and its sectoral indices as cases were increasing and lockdown announced in the country; but later on due to need of health care emergences and usage of modern technologies Pharma and IT sector were not reacted too much during the crisis period as IT companies declared work from home for their employees. Banking sector reacted along with the BSE.



The above graph showing the volatility in the log returns of S&P BSE indices, it can be inferred that there was not much volatility before the crisis period but during the announcement of lockdown in India market started reacting for the information as the pandemic affecting the world as a whole. But after lifting up the lockdown step by step, the market stared behaving as usual.

Indices	Average Returns	Standard Deviation	Correlation	Beta
	Pre-crisis	Pre-crisis	Pre-crisis	Pre-crisis
S&P BSE	0.00071828	0.009387285	--	--
Auto	0.00140757	0.016239261	0.81252666	0.469690062
Bank	0.00057054	0.01482557	0.905468282	0.573326311
Consumer Durables	0.00120100	0.012404336	0.587165752	0.44435208
Capital Goods	0.00001787	0.014131535	0.84359768	0.56038442
FMCG	0.00045412	0.008887074	0.774719045	0.818324289
Health Care	0.00084901	0.008230304	0.563492257	0.642705647
IT	0.00017278	0.011971091	0.168927509	0.132466687
Metal	0.00002918	0.018720098	0.694954454	0.348488331
Oil & Gas	0.00063483	0.0126394	0.725191884	0.538600192
PSU	-0.00035440	0.013773337	0.79013065	0.538517414
Reality	0.00007975	0.016295775	0.075469281	0.043474561

Indices	Average Returns	Standard Deviation	Correlation	Beta
	Present-crisis	Present-crisis	Present-crisis	Present-crisis
S&P BSE	-0.00068	0.027346	--	--
Auto	-0.00087	0.02952	0.885772	0.821024
Bank	-0.00285	0.035929	0.943514	0.71783
Consumer Durables	-0.0015	0.024409	0.864265	0.966146
Capital Goods	-0.00261	0.027025	0.854771	0.864191
FMCG	-0.00017	0.021845	0.780019	0.978427
Health Care	0.002101	0.020573	0.688611	0.917565
IT	0.001027	0.026968	0.823108	0.827468
Metal	-0.00175	0.032872	0.850766	0.707912
Oil & Gas	-0.00066	0.027765	0.864268	0.850025
PSU	-0.00246	0.026533	0.85711	0.883314
Reality	-0.003	0.029377	-0.0575	-0.05647

Markets were able to deliver good positive average returns during the pre-crisis period but only PSU fails to give the good returns; whereas during the crisis period only Health care and IT sector manage to deliver the positive returns but all other indices failed. Consumer durables and IT sector was not have good correlation with the Indices during pre-crisis period where all sectors were correlating with Indices apart from health care but Reality sector had negatively correlated with the Indices. The beta values are comparatively increased in all sectors apart from Reality sector – it has generated the negative value of -0.05647.

Table showing the correlation of different indices with S&P BSE

	S&P BSE	REALITY	PSU	OIL&GAS	METAL	IT	HEALTH CARE	FMCG	CONSUMER DURABLES	CAPITAL GOODS	BANK	AUTO
S&P BSE	1											
REALITY	0.908	1										
PSU	0.8961	0.9132	1									
OIL&GAS	0.9282	0.7735	0.8830	1								
METAL	0.9595	0.9460	0.9529	0.8973	1							
IT	0.7690	0.5855	0.5588	0.6765	0.6759	1						
HEALTH CARE	-0.1543	-0.4123	-0.5134	-0.1377	-0.3187	0.1942	1					
FMCG	0.8408	0.6494	0.7314	0.9071	0.7695	0.6731	0.0799	1				
CONSUMER DURABLES	0.8796	0.9086	0.8879	0.8118	0.8687	0.5461	-0.4299	0.7198	1			
CAPITAL GOODS	0.8606	0.8794	0.9791	0.8642	0.9113	0.5613	-0.5384	0.7222	0.9013	1		
BANK	0.9296	0.9648	0.9619	0.8390	0.9564	0.5552	-0.4731	0.6880	0.9294	0.9279	1	
AUTO	0.9742	0.8629	0.8825	0.9563	0.9445	0.7424	-0.1272	0.8641	0.8498	0.8593	0.88442	1

Conclusion

Market will move in a direction along with reacting to the news or information. Trend will break the fundamentals of the company and technical analysis will play a major role in the short term. Here also in the study the returns of the indices were good before the crisis and during the crisis, but only the immediate impact of covid-19 has reflected in the index along with its sectoral indices for a short period. The Sensex has recorded low on 23/03/2020 with 25981.24 points and the high was 41952.63 points on 14/01/2020 was recorded, from a record high market crashed to lowest points in just a 49 trading days. When country announced the unlock stage wise market started recovering itself and witnessed the reduction in the volatility, but during the lockdown period there was a high volatile in the market. The study concludes that there was an impact of covid-19 on the market in all the sectors excluding the Health care and IT and also Reality sector exhibited inverse actions against the market movement.

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