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Impact of Covid19 lockdown on NSE India indexes

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Abstract:

The covid19 pandemic had forced the Government of India to impose a nationwide lockdown. The present study aims to investigate the impact of lockdown on various NSE India indexes. Event study technique which is used to calculate the abnormal return of a stock has been used. The closing price of 11 NSE India indexes has been used for the analysis. A window period of (+40, -40) days pre and post the event day has been selected. Two-tailed test has been used to test the null hypothesis both at 5% and 1% level of significance. The result of the study shows that most of the indexes had abnormal returns.

Keywords: Covid19, index price, abnormal return, lockdown, event study

1. INTRODUCTION

Shares are part of owner’s capital owned by promoters, QIB’s and retail investors. These investors purchase and sell shares frequently depending on the bear and bull run in the market due to increase in demand for shares or decrease in demand and profit booking. Outstanding shares of a company are the shares that are available for trading. Outstanding shares are traded at share market or securities market. The share price of a company increases or decreases due to the news, events and decisions related to the company. The performance of a company reflects in its share price while the performance of a sector or industry is seen in its index closing price. Index price is calculated by using the share prices of the companies representing the sector. Indexes are prepared by taking into consideration a sample of companies which shall be representative of the entire sector. In India, there are some stock exchanges which prepare these indexes to measure the performance of different sectors out of which NSE India is a major one. As the share price of a company can be treated as a barometer to measure the performance of a company, likewise, the index calculated for a sector can be treated as a barometer to measure the performance of a sector. Whether the share price of a company shows negative growth or positive growth depends upon the performance of the company, sentiments of the market, future expectations of the market, unexpected events, etc. Likewise, the sectoral index will also show the result depending on the performances of the companies representing them.

In the latter half of 2019, an unknown disease broke out from the market of Wuhan in Wuhan province, China. The disease spread all over the world thereby resulting into a pandemic. In India, the disease was first detected among people who were returning from abroad and as feared, over time it spread all over the country. The pandemic led the Government of India to announce a national wide lockdown on 24th March, applicable from 25thMarch, 2020. The nationwide lockdown severely limited the activities of people and caused large business losses. People were forced to suspend their business activities including the large business houses. However, the lockdown provided exemption to some activities of essential nature like pharmaceuticals, etc. The lockdown abnormally affected the share prices of the companies consequently resulting into abnormality in the index prices as well. The future earnings, performance, economic growth, and sentiments associated with these companies were significantly affected.

In India, the lockdown was imposed in phases. Lockdown 1.0 was imposed from for 21 days later starting from 25th March, 2020 which was extended into lockdown 2.0 and so on, with certain relaxations every time. Strict lockdown was imposed time and again in the containment zones. The process of unlock was initiated from the month of June.

Share prices in the Indian stock exchanges show very muted response to events and even if the macro economic data shows poor performance, the shares keep moving in their normal trend without being affected much unless and until it is struck by a future defining event. Indian share market is seen to touch all-time highs even when there is a slowdown in the economy. The aim of the present study is to investigate the impact of the Covid19 lockdown on the various sectors represented in the capital market as the event is seen to affect earnings, jobs, growth, economy, money market, capital market, etc. For the study, various indexes prepared by NSE India will be used as an assumption that the indexes represent the different sectors of the capital market. Following are the indexes which have been used for the study: -

1) **Media**- Media companies were barred from shooting new shows or programs. However, they were allowed to air shows, movies and other entertainment programs which were pre-recorded. The news channels were allowed to cover news across the country while complying with the social distancing norms. Thus, the sector was partial exempted from operations. Sun TV Network, JagranPrakashan, Navneet, TV18 Broadcast, DB Crop, Hathway Cable, INOX Leisure, PVR, Zee Entertain, Music Broadcast, Dish TV, TV TodayNetwork and Hathway Cable are the companies representing the sectoral index.

2) **Auto**- The auto sector was completely restricted from continuing with their activities of production and sales. The Government of India allowed few companies to manufacture certain essential products like ventilators for oxygen support to patients. The companies which represent the nifty auto index are Tata Motors, Amara Raja Batt, Bosch, Exide Ind, Eicher Motors, MRF, Maruti Suzuki, Balkrishna Ind, Bharat Forge, TVS Motor, Bajaj Auto, Motherson Sumi, Ashok Leyland, M&M and Hero Motocorp.

3) **Metal**- Welspun Corp, APL Apollo, Ratnamani Metal, NMDC, Hindalco, Hind Zinc, MOIL, Coal India, Hind Copper, NALCO, Vedanta, JSW Steel, Jindal Steel, Tata Steel and SAIL are the companies which represents the nifty metal index. The demand was muted and the market was in oversupply during the lockdown. Coal and other essential minerals were allowed to be extracted as coal is used for electricity generation.

4) **FMCG**- The FMCG sector was allowed to operate but only the essential goods which were required for day to day use were allowed to be manufactured. The sector was therefore

partially allowed to operate. The sector faced problems in logistic support and transportation. The companies representing the sector are Godrej Consumer, Dabur India, Nestle, Marico, HUL, Britannia, ITC, Colgate, P and G, United Spirits, United Brewerie, Emami, TATA Cons. Prod, Jubliant Food and Varun Beverages.

5) **Realty**- The Realty sector was completely restricted from operating its activities. The companies representing the nifty realty index are Prestige Estate, Phoenix Mills, Mahindra Life, Sunteck Realty, Omaxe, Brigade Ent, Indiabulls Real, DLF, Oberoi Realty, Godrej Prop and Sobha.

6) **IT**- The companies representing the sectoral index of IT are Mphasis, Tech Mahindra, L&T Infotech, Mindtree, Wipro, TCS, Info Edge, Infosys, HCL Tech and COFORGE LTD.

7) **Bank**- The banking sector was allowed to operate during the lockdown due to its essential nature. Banking services were available to the public for withdrawal and deposit of cash. The companies representing the banking sector index are HDFC Bank, Kotak Mahindra, SBI, RBL Bank, Bandhan Bank, IDFC First Bank, Axis Bank, ICICI Bank, Bank of Baroda, Federal Bank, Indusland Bank and PNB.

8) **Financial services**- The financial service sector was partially allowed to operate during the lockdown and the companies representing the nifty financial service index are ICICI Lombard, Indiabulls Hsg, Shiram Trans, HDFC, HDFC Bank, Kotak Mahindra, SBI Life Insurance, SBI, Piramal Enter, Bajaj Finserv, Bajaj Finance, ICICI Prudentia, Axis Bank, ICICI Bank, Bajaj Holdings, Cholamandalam, REC, M&M Financial, HDFC Life and Power Finance.

9) **PSU bank**- All the PSU banks were allowed to operate in the lockdown and the companies representing the index of nifty PSU bank are SBI, Allahabad Bank, Oriental Bank, Syndicate Bank, Canara Bank, Bank of Baroda, Indian Bank, JK Bank, Union Bank, Bank of India, PNB, and Central Bank.

10) **Private bank**- The companies representing the nifty private bank index are City Union Bank, HDFC Bank, Kotak Mahindra, RBL Bank, IDFC First Bank, Axis Bank, ICICI Bank, Federal Bank, Yes Bank and Induslnd Bank.

11) **Pharma**- The pharmaceutical companies producing essential medicines were allowed to operate, produce and export few of the medicines. The companies representing the nifty pharma sectoral index are Torrent Pharma, Dr Reddys Labs, Cadila Health, Cipla, Lupin, Alkem Lab, Aurobindo Pharm, Divis Labs, Sun Pharma and Biocon.

12) **Nifty 50 index**- nifty 50 index is an index prepared by the National stock exchange of India to track the movement of the market. The index assists in tracking the bull and bear market. The index represents the overall performance of all the shares or stocks of the exchange.

Terminologies used in the study

NSE- National stock exchange of India
Covid19- Corona virus disease which caused a pandemic
Lockdown- restriction on movement and operation of activities
Indexes- Indexes are used as plural noun of Index
QIB- Qualified institutional buyers

FMCG- Fast moving consumer goods
PSU- Public sector undertaking of Government of India

2. OBJECTIVES OF THE STUDY

The study has been undertaken with the following objectives:
1. To examine the impact of Covid19 lockdown on NSE India indexes.
2. To investigate the nature of abnormal return of the NSE India indexes.

Hypotheses of the Study

The following are the hypotheses of the study:
1. H_0 = there is no significant impact of Covid19 lockdown on niftyauto index.
H_1= there is significant impact of Covid19 lockdown on nifty auto index.
2. H_0 = there is no significant impact of Covid19 lockdown on nifty metal Index.
H_1= there is significant impact of Covid19 lockdown on nifty metal Index.
3. H_0 = there is no significant impact of Covid19 lockdown on nifty realty index.
H_1= there is significant impact of Covid19 lockdown on nifty realty index.
4. H_0 = there is no significant impact of Covid19 lockdown on nifty FMCG index.
H_1= there is significant impact of Covid19 lockdown on nifty FMCG index
5. H_0 = there is no significant impact of Covid19 lockdown on nifty media Index.
H_1= there is significant impact of Covid19 lockdown on nifty media Index.
6. H_0 =There is no significant impact of Covid19 lockdown on nifty financial service index.
H_1= there is significant impact of Covid9 lockdown on nifty financial service index.
7. H_0 = there is no significant impact of Covid19 lockdown on nifty PSU bank index.
H_1= there is significant impact of Covid19 lockdown on nifty PSU bank index.
8. H_0 = there is no significant impact of Covid19 lockdown on nifty pharma index.
H_1= there is significant impact of Covid19 lockdown on nifty pharma Index.
9. H_0 = there is no significant impact of Covid19 lockdown on nifty private bank index.
H_1= there is significant impact of Covid19 lockdown on nifty private bank index.
10. H_0 = there is no significant impact of Covid19 lockdown on nifty IT index.
H_1= there is significant impact of Covid19 lockdown on nifty IT index
11. H_0 = there is no significant impact of Covid19 lockdown on nifty bank Index.
H_1= there is significant impact of Covid19 lockdown on nifty bank Index.

3. RESEARCH METHODOLOGY

Event study technique is a research method used for calculating abnormal return of a share price or an index. It investigates the impact of a particular event on the price of an index or stock. For this study, an estimation method and window period is required. Estimation method is to be used to estimate the normal return to know the abnormal return and window period is the period which has been selected to see the abnormal returns of the sectoral index. The process starts with the collection of closing price of the stock or index and market index. By taking into consideration the sector closing prices and market closing prices, the stock return and market return are calculated. The present-day closing price is deducted by yesterday's closing price to calculate the stock return and market return. After the calculation of stock return and market return, normal return of market is to be estimated using CAPM (Capital Asset Pricing Model) or any other method of calculating normal return. Post the calculation of normal return, abnormal return of the sector is calculated by deducting the normal return from the sectoral return. The abnormal return of a particular day will be of little use unless we calculate cumulative abnormal returns. The final task is to calculate the test statistics and test the hypothesis to know whether the null hypothesis has been accepted or rejected. The testing of hypothesis will be done by calculating the test statistics of the cumulative abnormal return of the window period and comparing it with the critical value at different levels of significance. If the value of test statistics is greater than the critical value at different levels of significance, the null hypothesis is rejected and the alternate hypothesis is accepted and vice-versa. The test of hypothesis is a two tailed one.

Estimation period is a period used to calculate the normal return. An estimation period can be of n number of days. For example, 250, 240, 200, 100, etc. The closing price of the n days is used to calculate the normal return. For the present study 250 days has been selected for the estimation.

The closing price of nifty 50 index of NSE India will be used to calculate the market return. Nifty 50 indexes is the index calculated by the NSE India to track the movement of the market.

Window period is a period which is selected to see the impact of an event on the stock or sector return. Window period are both pre and post the event date. For example (-40, +40), (-20, +20) and (-10, +10). For the present study, a window period of (-40,0, +40) days has been used.

Formulas for calculating sector return and market return-

Return = (R_t - R_{t-1})/ R_{t-1} (1)

Where,

R_t= closing price of today

R_{t-1}= closing price of the previous day

CAPM model or capital asset pricing model is a model use to estimate the normal return. The CAPM model uses the expected return of a sector and the risk involved in investing in the sector. The expected return is added to the risk multiplied with the market return which gives the normal return. The risk is denoted by beta (β) and expected return by alpha (α). The formula can be interpreted as-

Alpha (α) = intercept (sector return, market return) (2)

Beta (β) = slope (sector return, market return) (3)

Normal return= market return*Beta (β) + Alpha (α) [Y= mx+c] (4)

Abnormal return= sector return - normal return

Cumulative abnormal return (CAR) = sum of abnormal return

Standard error = $\sqrt{\frac{\sigma_1{}^2}{n_1}+\frac{\sigma_2{}^2}{n_2}}$ (5)

T- Statistics of CAR = CAR/ $\sqrt{\frac{\sigma_1{}^2}{n_1}+\frac{\sigma_2{}^2}{n_2}}$ (The test of hypothesis is two tailed test) (6)

Where,

σ_1 - Standard deviation of sector return

n_1 - 250

σ_2 - Standard deviation of market return

n_2 -250

4. DISCUSSION

Table 1: - Test statistics value of window days of auto sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (Positive/Negative)	Status Accept/ Reject	
			5%	1%
-40	-0.47	Negative	Accept	Accept
-30	-3.19	Negative	Reject	Reject
-20	-6.32	Negative	Reject	Reject
-10	+0.03	Positive	Accept	Accept
0	+ 4.05	Positive	Reject	Reject
+10	+3.71	Positive	Reject	Reject
+20	-1.25	Negative	Accept	Accept
+30	+7.11	Positive	Reject	Reject
+40	+11.12	Positive	Reject	Reject

Source: Computed and compiled by the author

The result of test statistics shows that the null hypothesis 1 has been rejected. The value of test statistics is [|+4.05| =4.05] which is greater than the critical value at both 5 % and 1% level of significance. Therefore, it can be concluded that the impact of lockdown on nifty auto index was significant.

Table 2:- Test statistics value of window days of metal sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (Positive/Negative)	Status Accept/ Reject	
			5%	1%
-40	-1.46	Negative	Accept	Accept
-30	-0.90	Negative	Accept	Accept
-20	-3.18	Negative	Reject	Reject
-10	-7.30	Negative	Reject	Reject
0	-2.44	Negative	Reject	Accept
+10	-0.25	Negative	Accept	Accept
+20	-7.95	Negative	Reject	Reject
+30	-2.37	Negative	Reject	Accept
+40	+1.04	Positive	Accept	Accept

Source: Computed and compiled by the author

The result of test statistics shows that the null hypothesis 2 has been rejected at 5% level of significance but has been accepted at 1% level of significance. The value of test statistics is [|-2.44|=2.44] which is greater than the critical value at 5 % level of significance but less than the critical value at 1% level of significance.

Table 3:- Test statistics value of window days of realty sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	+0.49	Positive	Accept	Accept
-30	-2.56	Negative	Reject	Accept
-20	-5.28	Negative	Reject	Reject
-10	-8.44	Negative	Reject	Reject
0	-18.43	Negative	Reject	Reject
+10	-26.08	Negative	Reject	Reject
+20	-28.64	Negative	Reject	Reject
+30	-30.80	Negative	Reject	Reject
+40	-35.34	Negative	Reject	Reject

Source: Computed and compiled by the author

The result of test statistics shows that the null hypothesis 3 has been rejected. The value of test statistics is [|-18.43|=18.43] which is greater than the critical value at both 5 % and 1% level of significance. Therefore, it can be concluded that the impact of lockdown on nifty realty index was significant.

Table 4:- Test statistics value of window days of FMCG sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	-0.07	Negative	Accept	Accept
-30	-0.21	Negative	Accept	Accept
-20	-0.49	Negative	Accept	Accept
-10	-1.99	Negative	Reject	Accept
0	-4.81	Negative	Reject	Reject
+10	-3.39	Negative	Reject	Reject
+20	-3.00	Negative	Reject	Reject
+30	-3.40	Negative	Reject	Reject
+40	-3.04	Negative	Reject	Reject

Source: Computed and compiled by the author

The result of test statistics shows that the null hypothesis 4 has been rejected. The value of test statistics is [|-4.81|=4.81] which is greater than the critical value at both 5 % and 1% level of significance. Therefore, it can be concluded that the impact of lockdown on nifty FMCG index was significant.

Table 5:- Test statistics value of window days of media sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	-0.24	Negative	Accept	Accept
-30	-1.15	Negative	Accept	Accept
-20	+1.01	Positive	Accept	Accept
-10	-3.28	Negative	Reject	Reject
0	-7.02	Negative	Reject	Reject
+10	-9.59	Negative	Reject	Reject
+20	-8.04	Negative	Reject	Reject
+30	-5.85	Negative	Reject	Reject
+40	-5.43	Negative	Reject	Reject

Source: Computed and compiled by the author

The result of test statistics shows that null hypothesis 5 has been rejected. The value of test statistics is [|-7.02|= 7.02] which is greater than the critical value at both 5 % and 1% level of significance. Therefore, it can be concluded that the impact of lockdown was significant on nifty media index.

Table 6:- Test statistics value of window days of financial service sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	+1.82	Positive	Accept	Accept
-30	+4.97	Positive	Reject	Reject
-20	+5.60	Positive	Reject	Reject
-10	+9.56	Positive	Reject	Reject
0	+2.53	Positive	Reject	Accept
+10	-11.19	Negative	Reject	Reject
+20	-12.83	Negative	Reject	Reject
+30	-19.19	Negative	Reject	Reject
+40	-28.08	Negative	Reject	Reject

Source: computed and compiled by the author

The result of test statistics shows that the null hypothesis 6 has been rejected at 5% level of significance but has been accepted at 1% level of significance. The value of test statistics is [|+2.53|=2.53] which is greater than the critical value at 5 % level of significance but is less than the critical value at 1% level of significance. The impact of lockdown was significant on nifty financial service index.

Table 7:- Test statistics value of window days of PSU bank sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	+0.09	Positive	Accept	Accept
-30	-0.35	Negative	Accept	Accept
-20	-1.32	Negative	Accept	Accept
-10	-1.84	Negative	Accept	Accept
0	+6.08	Positive	Reject	Reject
+10	+0.41	Positive	Accept	Accept
+20	-1.47	Negative	Accept	Accept
+30	-2.11	Negative	Reject	Accept
+40	-5.57	Negative	Reject	Reject

Source: Computed and compiled by the author

The result of test statistics shows that the null hypothesis 7 has been rejected. The value of test statistics is [|+6.08|= 6.08] which is greater than the critical value at both 5 % and 1% level of significance. Therefore, it can be concluded that the impact of lockdown nifty PSU bank index was significant.

Table 8:- Test statistics value of window days of pharma sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	+0.42	Positive	Accept	Accept
-30	-1.01	Negative	Accept	Accept
-20	-3.47	Negative	Reject	Reject
-10	+0.44	Positive	Accept	Accept
0	+2.08	Positive	Reject	Accept
+10	+28.50	Positive	Reject	Reject
+20	+30.04	Positive	Reject	Reject
+30	+27.77	Positive	Reject	Reject
+40	+30.96	Positive	Reject	Reject

Source: Computed and compiled by the author

The result of test statistics shows that null hypothesis 8 has been rejected at 5% level of significance but has been accepted at 1% level of significance. The value of test statistics is [|+2.08|=2.08] which is greater than the critical value at 5 % level of significance but less than the critical value at 1% level of significance.

Table 9:- Test statistics value of window days of private bank sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	+0.74	Positive	Accept	Accept
-30	+2.62	Positive	Reject	Reject
-20	+2.27	Positive	Reject	Accept
-10	+6.76	Positive	Reject	Reject
0	-9.96	Negative	Reject	Reject
+10	-14.67	Negative	Reject	Reject
+20	-12.06	Negative	Reject	Reject
+30	-19.89	Negative	Reject	Reject
+40	-25.46	Negative	Reject	Reject

Source: Computed and compiled by the author

The result of test statistics shows that the null hypothesis 9 has been rejected. The value of test statistics is [|-9.96|=9.96] which is greater than the critical value at both 5 % and 1% level of significance. Therefore, it can be concluded that the impact of lockdown on nifty private bank index was significant.

Table 10:- Test statistics value of window days of IT sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	+0.40	Positive	Accept	Accept
-30	+0.22	Positive	Accept	Accept
-20	+1.52	Positive	Accept	Accept
-10	-7.45	Negative	Reject	Reject
0	-19.22	Negative	Reject	Reject
+10	-19.06	Negative	Reject	Reject
+20	-16.38	Negative	Reject	Reject
+30	-11.49	Negative	Reject	Reject
+40	-10.20	Negative	Reject	Reject

Source: Computed and compiled by the author

The result of test statistics shows that null hypothesis 10 has been rejected. The value of test statistics is [|-19.22|=19.22] which is greater than the critical value at both 5 % and 1% level of significance. Therefore, it can be concluded that the impact of lockdown on nifty IT index was significant.

Table 11:- Test statistics value of window days of bank sectoral index and the status of rejecting or accepting the null hypothesis.

Window day	Value of test statistics of CAR (1.96 for 5% and 2.575 for 1 % level of significance)	Abnormal return (positive/negative)	Status Accept/ Reject	
			5%	1%
-40	+0.80	Positive	Accept	Accept
-30	+3.14	Positive	Reject	Reject
-20	+4.25	Positive	Reject	Reject
-10	+7.80	Positive	Reject	Reject
0	-2.75	Negative	Reject	Reject
+10	-11.40	Negative	Reject	Reject
+20	-10.57	Negative	Reject	Reject
+30	-19.66	Negative	Reject	Reject
+40	-26.43	Negative	Reject	Reject

Source: computed and compiled by the author

The result of test statistics shows that the null hypothesis 11 has been rejected. The value of test statistics is [|-2.75|=2.75] which is greater than the critical value at both 5 % and 1% level of significance. Therefore, it can be concluded that the impact of lockdown on nifty bank index was significant.

5. FINDINGS

Objective 1:

Table 12:- The impact of the event (lockdown) on different sectoral index at 5% and 1% level of significance.

Sectoral indexes	Impact	
	5%	1%
Nifty auto index	Significant	Significant
Nifty metal Index	Significant	Significant
Nifty realty index	Significant	Not-significant
Nifty FMCG index	Significant	Significant
Nifty media Index	Significant	Significant
Nifty financial service index	Significant	Significant
Nifty PSU bank index	Significant	Not-significant
Nifty pharma index	Significant	Significant
Nifty private bank index	Significant	Not-significant
Nifty IT index	Significant	Significant
Nifty bank Index	Significant	Significant

Source: computed and compiled by the author

The following are the findings of objective 1: -

I) The null hypothesis of all the sectors has been rejected and the impact of the lockdown on the sectoral index was significant.

II) The null hypotheses of all the sectors were also rejected at 1% level of significance except that the null hypothesis of realty sector, PSU bank sector and private bank sector and the alternative hypothesis were accepted.

We can conclude from the test of the hypothesis that the impact of lockdown on the sectoral index was significant. The impact of the event has resulted in abnormal returns. The impact was positive on few and negative on the remaining.

Objective 2:

For calculating the abnormal return, sectoral return is deducted from normal return. Therefore, incase sector return is greater than the normal return, there will be positive abnormal return and if normal return is greater than the sector return, there will be negative abnormal return.

The calculations of cumulative abnormal return and test statistics of abnormal return show negative value or positive value depending on the nature of the abnormal return. The value of the test statistics shall be positive if the cumulative abnormal return is positive and vice-versa. The following are the findings regarding the select sectors: -

1. **Nifty auto sector**- the values of test statistics show that prior to the announcement of lockdown, the sector showed negative returns. But after the announcement of lockdown, the sector showed cumulative positive returns on 0, +10, +20, +30 and +40 day of the event. It can be assumed that the market sentiments were positive post imposition of lockdown and the companies expected increase in vehicle/bike sales due to social distancing norms. They

assumed that citizens of the country would purchase vehicles for transportation to avoid overcrowding and being infected by the Covid19.

2. **Nifty metal**- The metal sector showed negative returns both prior to the announcement of lockdown and post the announcement of lockdown. The null hypothesis was rejected at 5% level but was accepted at 1% level. We can say with 95% level of confidence that the impact of lockdown was significant in nature but at 99% level of confidence we can assume that the lockdown had no significant impact on the sector. The sector was in trouble even before the event of Covid-19 and the event further added to the negative returns.

3. **Nifty realty** - The realty sector showed overall negative return in -40, 0 and +40 window period. Shutdown of construction activities affected the sentiments of the investors and the demand for property decreased. The test statistics value resulted in rejecting the null hypothesis and accepting that the lockdown had a significant impact on the sector. The realty sector was suffering recession and muted demand for past couple of years and the lockdown led to further abnormal returns.

4. **Nifty FMCG-** The test statistics value for -40 to-10 window day showed value greater than the critical value at both levels of significance. The sector was impacted both prior the event and after the event. Overall, the sector suffered due to other events prior to the event of lockdown. The FMCG sector showed decrease in sales in the rural economy and the event of the lockdown further added to its negative performance.

5. **Nifty media**- The lockdown was already announced in some states prior to the nationwide lockdown on 25 March, 2020. The media sector was restricted from shooting new shows, screening of movies and running of theatres. The media sector showed continuous negative returns from -40 to +40 window days. The testing of hypothesis resulted in rejection of null hypothesis and acceptance of alternative hypothesis. The lockdown had a significant impact on the sector.

6. **Nifty financial service**- The financial sector prior to the event of lockdown showed positive returns. But the event of lockdown affected the sector negatively and resulting in negative returns.

7. **Nifty PSU bank-** The PSU banks showed mixed abnormal returns. The impact on the sector was negative prior to the announcement of the lockdown and on the event of lockdown, the PSU banks showed positive cumulative returns. But later, the sector showed negative returns due to the impact of other events.

8. **Nifty pharma**- The pharma sector was the main beneficiary of the lockdown as the sector was showing mixed returns but from the -10 event day, the sector continuously showed increase in cumulative abnormal returns. The increase in demand for medicine and exemption of the sector during the lockdown resulted in better sentiments for the sector among the investors. The sector showed +30.96 test statistics value till the day +40.

9. **Nifty private bank**- The private sector banks were performing well and showed increase in the share price of the companies representing them. But after the announcement of the lockdown, the value of test statistics showed negative abnormal returns and the abnormal returns kept on increasing.

10. **Nifty IT**- The IT sector companies showed negative returns post the announcement of the lockdown. The testing of hypothesis showed test statistics value greater than the critical value at both 5% and 1% levels of significance.
11. **Nifty Bank**- Though banks were allowed to continue their operations, restriction on allotment of new loans and moratorium to the creditors affected the sector negatively.

6. CONCLUSION

The study aimed at examining the impact of lockdown due to Covid19 can be concluded with the results of the hypotheses tested. The testing of hypotheses resulted in rejecting of null hypothesis and acceptance of alternative hypothesis. Two tailed test showed significant impact of lockdown on the nifty India indexes. The impact was positive in some sector and negative on few others. Pharma sector showed highest positive abnormal returns due to increase in demand of medicines and increase in positive sentiments for the sector. Some sectors showed mixed impact in the window period and some showed cumulative returns.

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