

Research Article

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Impact of COVID - 19 on stock price of NSE in automobile sector

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Abstract

Keywords

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The sentiment in the stock markets across the world is gloomy. This is reflected in the frequent crashes in the share markets in all parts of the world. Financial markets in India are witnessing sharp volatility currently as a result of the fallout in global markets. The fall is in line with the global benchmark indices as the domestic market usually tracks the major global indices and the high volatility is likely to continue in the near future. Further, with overseas investors flying to the safety of dollar-backed assets from emerging markets has led to a sharp downfall in the Indian Stock Market. The NSE Nifty 50 which was 12362 points on 14th January, 2020 is 7511 points on 24th March, 2020. Hence, this paper made an attempt to study the impact of COVID-19 on stock market. This research study is an event study to analyze the stock price volatility of automobile sector. The outcome summary of the study revealed that there is a significant impact of automobile sector index price movements after the COVID – 19 in India.

1. Introduction

The corona virus disease (COVID-19) is the air spread disease which is widely and rapidly spread all over the world. This lead the government all over the world ordered their people of the country to restrict their normal activity for the prolonged period of time. To reduce the spreading of the disease both export and import and all the international flights of the country are temporarily blocked. This series of action which

are taken to avoid the COVID-19 leads to decrease in cash flow among the people and also due to lack of import and export the majority company lost their material sources and labors for their normal operations and also the major income of foreign currency through tourism is completely lost. It is the major financial loss for the India. Thus the most of the investors from the foreign country change their investment mode from

the Equity to other mode such as gold and other commodity. Hence the share market faces a huge blow due to COVID-19. Due to COVID-19, the average price and the total traded quantity of Indian stock market has been affected. So it is important to find the changes happened in the economy to prevent any future complications. The stock market data after COVID-19 are compared with before COVID-19. In this paper, the impact of COVID-19 has a huge effect. The research work specifically focused on the automobile sector alone.

2. Review of Literature

Aruna Murthy and A.H. Rajesh (2020) in their paper entitled “Impact of COVID-19 Virus Cases and Oil Price Shock on Indian Stock Returns. Structural VAR Approach”. They used Secondary data for their study and used structural VAR model to analyse the data. The study found that the sign of COVID -19 co-efficient is positive and statistically significant and the oil price shock also found positive and significant. It exhibit that any discrepancies is occurred in co-efficient of COVID- 19 the oil price co-efficient also affected.

Arun Gaikwad and CMA Sathish Dhokare. (2020) pointed out that this epidemic of COVID-19 affected the whole world and was felt throughout the industry. China, the second largest economy in the world, is stagnant. Planetary health organizations call the outbreak a national emergency. In India, we may have felt the supply chain disruption from China and the impact of China as a regional player. The impact of the pandemic on economic activity can be felt far beyond the aviation, transport, tourism and hospitality areas. Analysts see some contribution to the gross domestic product quarter from January to March 2020.

Rekha Rani (2020) in her paper entitled “Impacts of Corona Virus on Indian Economy state receipts from a much-delayed privatisation of India's second-biggest oil refiner, Bharat Petroleum Corp, could be lower by at least \$2 billion against initial estimates. The company's share prices have fallen by over 27 percent since January while the broader NSE Nifty 50 index has fallen by nearly 20 percent following a panic in global markets.

Warwick McKibbin† and Roshen Fernando (2020) explained that even a contained outbreak could significantly impact the global economy in the short run. These scenarios demonstrate the scale of costs

that might be avoided by greater investment in public health systems in all economies but particularly in less developed economies where health care systems are less developed and population density is high.

Peterson Ozili, (2020) discussed the Spillover of COVID-19: impact on the Global Economy. They draw on real-world observations in assessing the restrictive measures, monetary policy measures, fiscal policy measures and the public health measures that were adopted during the period. The study empirically examines the impact of social distancing policies on economic activities and stock market indices. The findings revealed that the increasing number of lockdown days, monetary policy decisions and international travel restrictions severely affected the level of economic activities and the closing, opening, lowest and highest stock price of major stock market indices.

3. Design of the Study

3.1 Objectives of the Study:

- ❖ To examine the stationarity of automobile sector index during before and after COVID-19.
- ❖ To analyze the volatility index price of automobile sector during pre and post COVID-19.
- ❖ Analyze the impact of COVID-19 on automobile sector.
- ❖ To measure the influence of COVID-19 in the price movements of automobile industry.

3.2 Hypothesis:

- ❖ H0: The Index price return of automobile sector is not volatile.
- ❖ H0: The COVID-19 does not influence the index price returns of automobile sector.

4. Methodology of the study

This study is of both descriptive and analytical in nature and discusses the positive and negative impact of COVID – 19 on automobile sector.

4.1 Sources of data

Secondary data of stock prices from NSE is taken. To examine the impact of COVID-19 the Sources like articles, journals, newspapers etc. are referred.

4.2 Period of data

In order to analyze the impact of COVID19 on automobile sector, 6 months data have been collected starting from 7th October 2019 to 19th March 2020 which consisted data of 3 months before COVID-19 and 3 months after COVID-19.

5. Data analysis and Interpretation

The data collected are analyzed through respective statistical tools like Relative Strength Index (RSI), Augmented Dickey Fuller Test (ADF) and GARCH (1,1) Model.

5.1 Measuring the speed and changes of price Movements by using Relative Strength Index (RSI):

The Relative Strength Index (RSI) is a technical indicator used in the analysis of financial markets. The RSI is classified as a momentum oscillator, measuring the velocity and magnitude of directional price movements. Momentum is the rate of rise or fall in price.

5.2 Price movements of automobile sector during the Pre – COVID-19 period:

Table No. 1. Average Value of RSI in Pre – COVID-19 in Automobile Sector

| Average Value | Upward | Downward | Average upward | Average Down | Relative Strength | RSI |
|---------------|--------|----------|----------------|--------------|-------------------|-------|
| | 43.21 | 25.89 | 36.96 | 29.23 | 1.76 | 51.97 |

Source: Collected from www.nseindia.com and computed

According to Wilder RSI normalized function, the values range from 0 to 100, with a value greater than 70 indicating an overbought condition and a value lower than 30 indicating an oversold condition. From table 1, it can be clearly observed that Pre – COVID-

The smoothing process affects RSI values. RSI values are smoothed after the first calculation. Average Loss equals the sum of the losses divided by 14 for the first calculation. Subsequent calculations multiply the prior value by 13, add the most recent value and then divide the total by 14. This creates a smoothing affect. The same applies to Average Gain. Because of this smoothing, RSI values may differ based on the total calculation period.

The formula for RSI is

$$RSI = 100 - (100 / (1 + RS))$$

$$RS = \text{Average gain per day} / \text{Average loss per day}$$

The change can be calculated by the difference between current price and previous price. Then the upward can be calculated by the increasing in the change, the downward can be calculated by the decreasing in the change. Then the average upward and average downward can be calculated by average upward price before 14 days and average downward price before 14 days for each and every day respectively.

19 period the RSI value was average (51.97188) i.e., average performance of share, this value indicates the shares are neither overbought or oversold due to average performance of the company Share during pre – COVID-19.

5. 3 Price movements of automobile sector during the Post – COVID-19 period:

Table no. 2. Average Value of RSI in Post – COVID-19 in Automobile Sector

| Average Value | Upward | Downward | Average Upward | Average Downward | Relative Strength | RSI |
|---------------|--------|----------|----------------|------------------|-------------------|-------|
| | 24.55 | 79.33 | 23.54 | 66.13 | 0.53 | 29.57 |

Source: Collected from www.nseindia.com and computed

It appears from the table that there is an average performance (29.57) which has been recorded in automobile sector index. The data analysis shows that there is significant impact of COVID-19 which is found in automobile sector index stock price during the study period.

5.4 Measuring stationarity of stock price during the pre-COVID-19 period by using Augmented Dickey Fuller Test (ADF):

The Augmented Dickey Fuller Test (ADF) is unit root test for stationarity. Unit roots can cause unpredictable results in time series analysis. The Augmented Dickey-Fuller test can be used with serial correlation.

Table no. 3: ADF of Pre – COVID-19 in Automobile Sector

| Unit Root Test for Automobile Index | | t-Statistics | Prob.* |
|---|-----------|--------------|--------|
| Augmented Dickey-Fuller test statistics | | -6.790567 | 0.0000 |
| Test critical values: | 1% level | -3.555023 | |
| | 5% level | 2.915522 | |
| | 10% level | -2.595565 | |

Source: Collected from www.nseindia.com and computed using E – Views 7

The table 3 represents that the results of Augmented Dickey Fuller test for Automobile Index for the Pre – COVID-19. The t-statistics value (-6.790567) is lesser than the critical value at all the level of significance in the price returns of Automobile index. Hence it can be

interpreted that the automobile sector index price of pre COVID-19 period has been obtained stationarity in the level itself. Further the P value represents the rejection of hypothesis.

5.5. Measuring stationarity of stock price during the Post-COVID-19 period by using Augmented Dickey Fuller Test (ADF):

Table no. 4: ADF of Post – COVID-19 in Automobile Sector

| Unit Root Test for Automobile Index | | t-Statistics | Prob.* |
|---|-----------|--------------|--------|
| Augmented Dickey-Fuller test statistics | | -3.817418 | 0.0053 |
| Test critical values: | 1% level | -3.581152 | |
| | 5% level | -2.926622 | |
| | 10% level | -2.601424 | |

Source: Collected from www.nseindia.com and computed using E – Views 7

The table implies the stationarity of automobile sector index. The result of ADF indicates that the index price of the automobile sector has been obtained stationarity at all levels. T-Statistics value (-3.817418) is lesser than critical value in all the levels. The P value confirms that there is the rejection of null hypothesis.

5.6 Measuring volatility of stock price during the pre-COVID-19 period by using Generalized Autoregressive Conditional Heteroskedasticity [GARCH (1, 1)]:

The GARCH (1, 1) is the simplest and most robust of the family of volatility models. However, the model can be extended and modified in many ways. To examine the volatility level prevailing in the stock market, GARCH (1, 1) model has generated different values for different parameters.

Table no. 5. GARCH (1,1) of Pre – COVID-19 in Automobile Sector

| Mean Equation | | | |
|-------------------|--------------|------------|--------------|
| Variable | Co-efficient | std. Error | Z-Statistics |
| C | 0.000258 | 0.001327 | 0.194107 |
| Variance Equation | | | |
| C | 2.47E-06 | 3.19E-06 | 0.773180 |
| RESID(-1)^2 | -0.093096 | 0.034764 | -2.677918 |
| GARCH(-1) | 1.073551 | 0.054736 | 19.61330 |

Source: Collected from www.nseindia.com and computed using E – Views 7

The above table examines the results of the mean and variance equations of GARCH Model for the Automobile Index daily returns from 7th October 2019 to 30th December 2019. It is found from the analysis that the selected sample index has obtained high

volatility of 0.980455 (-0.093096 + 1.073551) during the study period. That is 98 percent of volatility exist in the selected sample index during the study period. Hence the hypothesis “The Index price returns of sample indices are not volatile” is rejected.

5.7 Measuring volatility of stock price during the Post-COVID-19 period by using Generalized Autoregressive Conditional Heteroskedasticity [GARCH (1,1)]:

Table no. 6: GARCH (1,1) of Post – COVID - 19 in Automobile Sector

| Mean Equation | | | |
|-------------------|--------------|------------|--------------|
| Variable | Co-Efficient | std. Error | Z-Statistics |
| C | -0.003263 | 0.002036 | -1.602627 |
| Variance Equation | | | |
| C | -1.78E-05 | .1.26E-05 | -1.410556 |
| RESID(-1)^2 | -0.049746 | 0.095723 | -0.519685 |
| GARCH(-1) | 1.207225 | 0.119600 | 10.09389 |

Source: Collected from www.nseindia.com and computed using E – Views 7

The result implies that the index price returns of automobile sector after the COVID – 19 obtained significant volatility of 1.157479 (-0.049746 + 1.207225) during the study period. That is 116 percent of volatility exist in the selected sample index during the study period. Hence the hypothesis “The Index price returns of sample indices are not volatile” is rejected and confirmed that there is significant volatility existed in automobile industry during the study period.


determine the impact of COVID – 19 and higher amount of equities been sold at undervalued exhibits significant impact in the selected sectoral index in India. Comparing the return of the automobile sector index has been recorded low return. Hence with the results of all the analysis it can be understood that the COVID-19 in India made an adverse impact in automobile sector during the study period. The sudden fall of stock values affect the industry manufacturing process and it has been influenced the stock market for a period and it may recover soon with optimum potential.

6. Conclusion

The main aim and purpose of the study is to analyse the impact of COVID - 19 on Stock Market especially in automobile sector of National Stock Exchange. Result from the GARCH (1,1) and RSI help to

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