

COVID-19 Lockdown Announcement and Stock Market Volatility of Selected Industry : An Event Study

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Abstract

The impact of the coronavirus pandemic and the lockdown it triggered is clearly visible in the financial markets. But there is still no clarity on the deeper impact that it is having across businesses and industrial sectors. To empirically investigate the effect of announcement of COVID-19 lockdown on the volatility of share price of healthcare industry is the main aim of this study. Closing share prices on daily basis of Nifty Healthcare Index companies has been taken for analysis from pre and post period of COVID-19 lockdown announcement. Event study approach and t-test have been used to investigate the effect of aforementioned event, for which average annual returns have been calculated over various event windows such as $(-15, +15)$, $(-10, +10)$, $(-5, +5)$ and $(-2, +2)$. The result of the study reveals that the announcement of COVID-19 lockdown does not significantly impact the healthcare industry under various window periods except window period $(-10, +10)$.

Keywords: COVID-19, Event study, Healthcare, Lockdown, Nifty, Stock market.

Introduction

COVID-19 is an ongoing pandemic of coronavirus disease 2019, the primary cause of which is SARS-CoV-2. In December 2019, Wuhan, China, reported its first case, and over time, it spread to other parts of the world. It was classified as a pandemic by the World Health Organisation (WHO) in March 2020. India reported its first confirmed case of the coronavirus infection on 30th January, 2020 in Kerala. This ongoing pandemic isn't just global health emergency; it's also a major global economic decline. (Bora & Basistha, 2021) The economic damages are already visible and represent the largest economic shock the world has experienced in decades. The profound recession brought on by the pandemic is anticipated to have long-term effects due to decreased investment, trade fragmentation, and supply chain disruptions.

The coronavirus pandemic had a substantial influence on the global economy, creating uncertainty and risk. It had an effect on both

developed and emerging economies, including those of the China, USA, Italy, Spain, Brazil and India. The financial market was negatively impacted and moved dramatically in such an environment. Due to the significant increase in global financial risk, investors are experiencing massive losses as a result of anxiety and uncertainty. Since 1987, the Financial Times Stock Exchange 100 index fell significantly in one day in Europe. ("Coronavirus : Stock markets suffer worst quarter since 1987," 2020)

According to Azimli (2020), the increased uncertainty has an impact on the required rate of return and, consequently, the stock's current market value. This unanticipated pandemic has had a negative impact on most financial markets in developed and emerging countries. The Indian stock market likewise experienced extreme volatility as a result of the collapse in the global financial market. While the intensity of coronavirus disease impact differs from sector-to-sector, there are few sectors like aviation, tourism, automobile, real estate and pharmaceuticals which were badly hit and might continue to suffer until life turns back to normal. India has two main stock indices: Bombay Stock Exchange's (BSE) Sensex and National Stock Exchange's (NSE) Nifty. On 23rd March, 2020, both the indices of BSE and NSE faces its biggest crash, Nifty dropped 13 percent, which was the steepest fall for the index, similarly Sensex dropped 13.2 percent, lowest close since December, 2016. (Modak, 2020)

Some economists have referred to COVID-19's impact on the Indian stock market as a "black swan incident" in order to describe the occurrence of a highly unpredictable event with unfavourable outcomes. The government's lockdown approach has caused industries to reduce both their labour force and output levels, which has disrupted the supply chain. Demand-side shock happens when people change their spending habits as a result of global volatility. Studies indicate that the prior pandemic only had an effect on the demand chain; however, the COVID-19 pandemic has had an effect on both the supply and demand chains. (Bora & Basistha, 2021)

Review of Literature

Guru & Das (2021) examine in their exploration paper the effect of COVID-19 on the instability overflows among ten

significant area files recorded in BSE India and tracked down that total volatility spill overs arrived at 69 per cent during COVID-19. The major net instability transmitters were in the energy sector, followed by oil and gas.

Using a generalised autoregressive conditional heteroscedasticity model, Bora & Basistha (2021) examined the effect of the COVID-19 on stock price volatility in India and came to the conclusion that the pandemic period was volatile for the Indian stock market. Additionally, they discovered that the return on Nifty and Sensex was higher in the pre-COVID-19 time than it was during COVID-19 when comparing the results to those of the pre-COVID-19 period.

Chaudhary, Bakhshi, & Gupta (2020) investigated how COVID-19 affected the return and unpredictability of the securities exchange indexes of the top 10 GDP-dependent countries. For all market data over the COVID time period (January 2020 to June 2020), the results showed daily negative mean returns. All market data show the COVID variable to be positive and significant as an external fluctuation regressor in GARCH analysis. The results also supported the mean-returning relationship across all market indices.

Rajamohan, Sathish & Rahman (2020) made an effort to investigate COVID-19's impact on the stock market. The result synopsis of the investigation uncovered that there is a significant impact of automobile sector index price movements after the COVID-19 in India.

Aruna & Rajesh (2020) in their paper tracked down that the indication of COVID-19 coefficient is positive and genuinely critical and the oil value stun likewise discovered positive and huge effects. It shows that any disparities happened in coefficient of COVID-19, the oil value coefficient is additionally influenced.

Kumar & Kumara (2020) using the financial exchange data of the pre and post COVID-19 status by contrasting the data from January to June 2020, dissected the market capitalization relationship between the exhibitions of offers and the development of the share market. The alterations in the market's presentation and the assessment of its market capitalization have a positive and demonstrably strong significance.

Bash (2020) in his paper employed an event study approach to look at how the COVID-19 first registered instance affected the returns of thirty stock markets. Results of the study reveal that a downward trend significant negative returns are experienced by stock markets following the COVID-19 outbreak.

Research Gap

In many articles, it has been covered that the COVID-19 pandemic has hit the industries such as aviation, tourism, automobiles, entertainment business, etc. One sector which plays a crucial role during the period of an outbreak is the Healthcare sector. While reviewing the recent literature, it has been noticed that the researchers did not pay much attention on the Healthcare sector during the coronavirus outbreak and the impact of lockdown coronavirus outbreak triggered. This gap motivated us to carry out this research on the effect of COVID-19 lockdown announcement on Healthcare industry in India.

Objectives

1. To analyse the effect of COVID-19 lockdown announcement on Nifty Healthcare Index performance.
2. To analyse the volatility of Nifty Healthcare Index during pre and post COVID-19 lockdown announcement.

Hypotheses

H01: There is no significant difference in average abnormal return pre and post announcement of lockdown for the

event window (-15, +15).

H02: There is no significant difference in average abnormal return pre and post announcement of lockdown for the event window (-10, +10).

H03: There is no significant difference in average abnormal return pre and post announcement of lockdown for the event window (-5, +5).

H04: There is no significant difference in average abnormal return pre and post announcement of lockdown for the event window (-2, +2).

Data & Methodology

The sample for the study has been taken from NSE. Nifty Healthcare Index comprising ten Healthcare companies as on 31st December, 2020 has been selected for the purpose of the study. Nifty Healthcare Index consists of following Healthcare companies: Sun Pharmaceutical Industries Ltd., Dr. Reddy's Laboratories Ltd., Divi's Laboratories Ltd., Cipla Ltd., Aurobindo Pharma Ltd., Lupin Ltd., Apollo Hospitals Enterprise Ltd., Biocon Ltd., Ipca Laboratories Ltd. and Torrent Pharmaceuticals Ltd. Two type of information is required for achieving the objective such as, Event and Historical share price data of the selected companies. Daily share price data of selected companies has been gathered from the National Stock Exchange Ltd.'s (NSE Ltd.) official website. Event is selected such as in Table 1.

Table 1 : Event Selected

Event	Announcement Date
COVID-19 Lockdown	23 rd March, 2020

The required information has been collected from official website of Government of India. Event study approach has been used to examine the effect of the selected event (mentioned in Table 1) on stock price (or abnormal returns) of selected Healthcare companies. As this approach helps to determine the abnormal return associated with company's share price during the window period. The effect of an event can be measured in two aspects such as: pre-occurrence and

post-occurrence of event. The event window, also known as the event period, is used to identify a specified time frame before and after the event. Typically, this time period is 5 or 10 days (Park, 2004). In this study researcher has selected four event windows such as (-15, +15), (-10, +10), (-5, +5) and (-2, +2) and estimation period of 103 trading days have been considered to forecast accurately. COVID-19 lockdown announcement day is referred as day "0".

To assess the impact of a specific event during a test period, an abnormal return is the difference between the expected return and the actual return. The formula below is used to calculate the daily return of a share price using the estimation window and the event window:

$$R_t = \frac{P_t - P_{t-1}}{P_{t-1}}$$

where, R_t = Daily stock return on day 't', P_t = Closing stock price on day 't' and P_{t-1} = Closing stock price on day 't-1'.

Event Study's expected return is estimated using a simple regression with parameters recognized in the estimation window. A simple regression using stock returns and market returns is used in this analysis. A market model, as a statistical model, connects share returns to market index returns, written below:

$$E(R)_t = \alpha + \beta R_{MKT}$$

where, $E(R)_t$ = Stock's expected return for day 't', α = Regression equation's Intercept, β = Stock's Beta value

Data Analysis

Event study methodology has been shown in Table 2. Abnormal returns have been calculated over four event windows viz. (-15, +15), (-10, +10), (-5, +5) and (-2, +2).

Table 2 : Result of COVID-19 Lockdown Announcement Effect on Stock Prices

Null Hypotheses	Event Window	CAAR	Days	t-statistics of CAAR	p-value
---	(0)	- 0.82286	-	-	-
There is no significant difference in average abnormal return pre and post announcement of lockdown for the event window (- 15, +15).	(- 15, +15)	- 22.8578	31	- 1.351049628	0.198
There is no significant difference in average abnormal return pre and post announcement of lockdown for the event window (- 10, +10).	(- 10, +10)	- 14.8478	21	- 2.314810291	0.046
There is no significant difference in average abnormal return pre and post announcement of lockdown for the event window (- 5, +5).	(- 5, +5)	- 8.21811	11	- 1.631808612	0.178
There is no significant difference in average abnormal return pre and post announcement of lockdown for the event window (- 2, +2).	(- 2, +2)	- 3.71437	5	- 0.300882315	0.813

(slope) and $RMKT$ = Return in market for day 't'.

Abnormal Return (AR), a tool used in event analysis, is used for calculating the impact of an event. The following is the equation for a stock's AR at time (t):

$$AR_t = R_t - E(R)_t$$

where, AR_t = Abnormal return for day 't', R_t = Stock's actual return for day 't' and $E(R)_t$ = Stock's expected return for day 't'.

The following formula is used to determine a stock's Cumulative Abnormal Return (CAR) during the event period.

$$CAR_{t;t+k}^i = \sum AR_{i,t+k}$$

Following that, the average CAR for all the observations over the specified period is determined as follows:

$$CAR_{t;t+k} = \frac{1}{N} \sum_{n=1}^N CAR_{i,t+k}^n$$

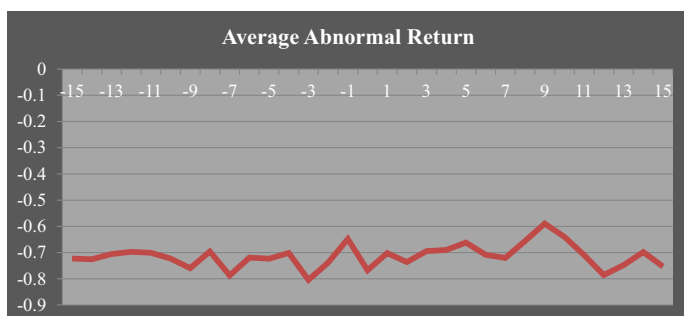
Table 2 shows the result of COVID-19 lockdown announcement effect on stock prices, which reveals that shareholders earned abnormal returns on the event day and on various event windows for Nifty Healthcare Index consisting ten healthcare companies. Furthermore, it shows the result of t-test that was performed to assess the statistical significance of Average Abnormal Return (AAR) and Cumulative Average Abnormal Return (CAAR).

By investing in the firms with high CAAR, shareholders can earn abnormal returns since high abnormal return indicates that the market is unable of digesting the event as it arrives the market.

The CAAR value of -0.82286 per cent for day “0”, the day of the lockdown announcement, indicate that shareholders experienced abnormal loss to the extent of -0.82286 per cent.

The Table 2 also shows that the CAAR experienced by the shareholders of the selected companies is 22.8578 per cent during the event window of 31 days $(-15, +15)$, -14.8478 per cent during the event window of 21 days $(-10, +10)$, -8.21811 per cent during the event window of 11 days $(-5, +5)$ and -3.71437 per cent during the event window of 5 days $(-2, +2)$. Since, the results shows that all the event windows $(-15, +15)$, $(-5, +5)$ and $(-2, +2)$ have lower magnitude of t-value i.e., the p-value is more than 0.05, which indicates that there is no statistically significant difference among these event windows and hence the researcher failed to reject the null hypotheses (H01, H03 and H04). The event window $(-10, +10)$ has higher magnitude of t-value i.e., p-value is less than 0.05 hence for this event window there is a significant difference. Hence, the researcher rejects the null hypothesis (H02).

Figure 1 : Average Annual Returns of Pharmaceutical Companies



Source : Authors' compilation.

Figure 1 shows the plotted Average Abnormal Return over the window period $(-15, +15)$. Abnormal returns have been calculated for each company selected for 15 days pre-occurrence and post-occurrence of the event. Average Abnormal Return (AAR) and CAAR are beneficial for knowing the proficiency of the market. From the figure it can be seen that the fluctuation is around the window period $(-10, +10)$ and minimum Average Abnormal Return has been observed on the 9th day after the announcement of lockdown.

Conclusion

The impact of the COVID-19 lockdown announcement on the stock prices of the Indian healthcare industry has been studied using an event study methodology. The findings of the study reveal that investing methodically during the announcement of COVID-19 lockdown reportedly resulted in nominally abnormal returns for investors. COVID-19 lockdown has vigorously impacted the healthcare industry. During the COVID-19 period (lockdown) government was and still enthusiastically investing in the healthcare industry for the eradication of COVID-19 and for the development of vaccine. India was one of the biggest exporters of hydroxychloroquine tablets to USA during this period. Hence, from the above result it is concluded that no significant impact was assessed for the window period $(-15, +15)$, $(-5, +5)$ and $(-2, +2)$, but for the window period $(-10, +10)$ a significant difference was observed. On an overall basis there was not much of significant impact of COVID-19 lockdown announcement on healthcare industry for pre 15 days and post 15 days.

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