



Impact of COVID-19 Cases on Stock Market Return: An Analysis of Indian Stock Markets

Dr. Vinod Kumar Bhatnagar

Head and Associate Professor, IPS College of Technology and Management, Gwalior, MP, India

Co-author: Shalini Girdhar

Research Scholar, Jiwaji University, Gwalior, MP, India

***Corresponding Author: Dr. Vinod Kumar Bhatnagar**

*R-34 New Kushal Nagar, Behind Kamakshi Apartment, Gwalior, MP, India- 474002,
Email: dr.vinodbhatnagar@gmail.com, ORCID ID: <https://orcid.org/0000-0002-0425-6885>

ABSTRACT

This paper empirically investigates the impact of COVID-19 cases on the volatility of stock prices in India. Daily closing prices of stock indices, Nifty and Sensex from January 30, 2020, to December 15, 2021 have been used for the analysis. To check whether a time series is stationary or non-stationary, Augmented Dickey-Fuller (ADF) unit root test was applied and to check the impact of COVID-19 cases on stock returns, Granger Causality test was applied. Findings reveal that the datasets are stationary and have no unit root. COVID-19 cases do not have any impact on BSE and NSE stock returns, there are some other factors that affect stock volatility.

Key words: COVID-19 cases, BSE, NSE, Stock Return, India

INTRODUCTION

The COVID-19 pandemic has affected the entire world. Many countries, including India, have adopted the safest and easiest way of lockdown as an emergency step to prevent the pandemic. The outbreak of pandemics kept the stock market out of predictions. It has made stocks highly volatile. (Dayong Zhanga, 2020). The patterns of particular country markets have affected the exchange of other countries due to global lockdown and pandemic which also result in share prices being volatile. Volatility often refers to the amount of uncertainty or risk related to the size of changes in a security's value, during the pandemic Indian stock markets were very volatile.

There are two major stock indices in India—Bombay Stock Exchange (BSE), Sensex, and National Stock Exchange (NSE), Nifty. If we look at the Bombay Stock Exchange and National Stock Exchange there was an all-time high in BSE Index and NSE Nifty on October 18, 2021 (BSE-61765.59, NSE-18477.05) and an all-time low on March 23, 2020 (BSE-25981.24, NSE-7610.25). Due to the COVID-19, volatility has been observed not only in the Indian stock market but in the global stock markets.

REVIEW OF LITERATURE

A study by Shehzad et al. (2020) analyzed the nonlinear behaviour of the financial market returns of the United States, Italy, Japan, and China by applying the asymmetric power GARCH model. It confirmed that COVID-19 negatively affects the stock returns of the S&P 500. However, it also revealed that there is an inconsequential impact on the Nasdaq composite index.

Cepoi (2020) conducted an empirical study on the relationship between COVID-19 related news and stock market returns across the topmost affected countries using panel quantile regression, according to this study the stock market presents asymmetry dependence on COVID-19 related information.

Adenomon et al. (2020) conducted a study by applying quadratic GARCH and exponential GARCH models with dummy variables and found that the COVID-19 affects the stock returns in Nigeria and recommended that a stable political environment, incentive to indigenous companies, diversification of economy, and flexible exchange rate regime be implemented.

Ozili and Arun (2020) conducted an empirical study on the effects of social distancing policy that was adopted to prevent the spread of the Coronavirus, based on four continents: North America, Africa, Asia, and Europe. As per the study, 30 days of social distancing policy or lockdown affects the economy through its negative impact on stock prices. Moreover, Ali, Alam, & Rizvi (2020) reported in their research that there was a global reaction on financial markets in terms of fall and volatility as the Coronavirus epicenter travelled from China to Europe and eventually to the United States.

A research conducted by Al-Thaqeb et.al (2020) demonstrated that a high EPU(Economic Policy Uncertainty Index) has negative consequences for individuals, organization and government, as they tend to postpone numerous financial decisions in the face of high uncertainty, lower consumption, reduce debt issuance, reduce investment and there is a higher rate of unemployment. In addition an experimental research done by Dimitrios Bakas and Athanasios Triantafyllou (2020) studied the impact of pandemics on commodity price volatility they studied that the effects of economic uncertainty associated with global pandemics affects the volatility of the S&P GSCI commodity index, as well as the crude oil and gold sub-indices. Furthermore, Ashraf (2020) found in his research that the projected economic effect of Government acts remarkably affects stock market returns.

Buszko et.al (2021) conducted a study on Warsaw stock exchange. The aim was to see how different industries represented by stock market indexes reacted to the COVID-19 pandemic it was found that some sectors remained stable and resistant during the pandemic.

On the other hand, Baker et.al (2020) studied the government restrictions on commercial activity and voluntary social distancing and found that both have powerful effects in a service oriented economy. This was the primary reason that the stock market in the United States reacted to COVID-19 so forcefully than it did to previous pandemics in 1918-19, 1957-58 and 1968. Cox et.al (2020) studied the heterogeneous effects of the pandemic on spending and savings of U.S. households. Results suggest that labour market disruptions were unlikely to be a primary factor driving spending declines in these initial months of the recession. Many of the effects of labour market disruptions on spending were likely offset by sizable fiscal stimulus. Instead, direct effects of the pandemic were likely the primary factor driving overall declines in spending during this period.

Huo & Qiu (2020) studied China's stock market reaction in the COVID-19 breakout in 2020. The research specifically studied the lockdown of the pandemic. Further this study revealed that overreactions were stronger for firms with lesser institutional ownership, implying that COVID-19 has a stronger impact on ordinary investors.

Moreover, Al-Awadhi et.-al.(2020) did a natural experiment to study the impact of COVID-19 a contagious disease on the Chinese stock market. They used panel data analysis to investigate whether communicable infectious diseases have an impact on stock market and found that both the daily growth in total confirmed cases and in total cases of death caused by COVID-19 have significant negative effects on stock returns across all companies.

Haroon and Rizy (2020) stated the relationship between news related to Corona Virus outbreak (COVID-19) and price volatility in financial market. As there is more panic in media about coronavirus it leads to increase in equity market price change.

Zhang, Qiang and Ji (2020) analyzed unprecedented level of risk, causing investors to suffer significant losses and found that Policy reactions to contain the virus and level the stock markets are needed; however, non-conventional policy interventions, such as the US' unlimited QE, create further uncertainty and may cause long-term problems. As for India Mahajan (2020) stated that corona virus pandemic has impacted FMCG sector and employment in India due to movement of labour to their homeland. In addition, Siddiquei and Khan (2020) studied the negative impact of corona virus on industries and emerging economies travel and tourism, hospitality, stock market and found that Corona virus has affected the entire Chinese economy and being China is the second-largest economy in the world, its spill-over effect all over the world. The growth rate of most of the sectors in China has come down but the service center has been affected the most. Also Sinha et.-al. (2020) stated the negative impact on Indian stock market due to COVID-19 by examining the performance and providing the reason for gain in stock market despite the slowing of Indian economy and analyzed the reason of increase of large-cap equities and fall of Small-cap and Mid-cap companies. Moreover, Bora and Basistha (2021) studied the stock market performance from September 3, 2019 to July 10, 2020 by studying the closing prices of stock indices and also compared stock price returns in pre and post COVID-19 by using generalized autoregressive conditional heteroscedasticity model. This study resulted that the return on the indices was larger in the pre COVID-19 time than in the COVID-19 period.

Other studies in India show that Agarwal & Singh (2020) focused on COVID-19 impact on Indian economy and government's policy framework in this area and also on the industries which have grown due to tax cut during the pandemic. Study revealed that COVID-19 made adverse impact on many sectors of Indian Economy. Also, Alam, Alam, & Chavali(2020) investigated the impact of lockdown on Indian Stock Market and its reaction during pre- and post-COVID-19 lockdown periods. This investigation showed that there is positive AR in lockdown period and had beneficial impact on stock market performance in the Indian context. Finally, Ozili and Arun (2020) by using significant government programmes stated that COVID-19 had expanded majority of countries. Also there is positive impact on economic activities due to internal movement restrictions and higher fiscal policy spending on the other hand there is no significant effect of confirmed COVID-19 cases on economic.

OBJECTIVE

This research aims to analyze the effect of daily-confirmed cases of COVID-19 registered in India on BSE and NSE stock returns.

METHODOLOGY

The study is based on secondary sources of data. Data on daily closing prices of indices Nifty and Sensex have been collected from the official site of BSE (<https://www.bseindia.com>) and NSE (<https://nseindia.com>). Data were collected from January 30, 2020, to December 15, 2021. The first positive case of COVID-19 was found on January 30, 2020 in India. Data on COVID-19 positive cases were collected from the report of the Ministry of Health and Family Welfare, Government of India (<https://www.mohfw.gov.in/>).

Data Analysis

Hejase et al. (2012) contend that informed objective decisions are based on facts and numbers, real, realistic and timely information. Furthermore, according to Hejase and Hejase (2013), “descriptive statistics deals with describing a collection of data by condensing the amounts of data into simple representative numerical quantities or plots that can provide a better understanding of the collected data” (p. 272). Therefore, this paper reports first the mean, median, maximum and minimum values, skewness, and standard deviation of variables. Moreover, in this paper, the closing price of BSE and NSE has been considered for computing the return and analyzing the volatility of the stock market. To check whether a time series is stationary or non-stationary, an Augmented Dickey-Fuller (ADF) unit root test was applied and to check the impact of COVID-19 cases on stock return, Granger Causality test was applied

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RESULTS AND DISCUSSION

Table-1: Descriptive Statistics

SERIES	COVID-19_CASES	BSE_RETURN	NSE_RETURN
Mean	49502.38	0.000876	0.000899
Median	26727.00	0.001866	0.001895
Maximum	414188.0	0.089749	0.087632
Minimum	0.00000	-0.131526	-0.129805
Stad. Dev.	74663.18	0.016309	0.015976
Skewness	3.045167	-1.376887	-1.460578
Jarque-Bera	2461.445	4246.400	4379.833
Probability	0.000000	0.000000	0.000000

Mean is the average value of the series and in case of COVID-19 cases, the mean values of the ‘BSE index return’ and ‘NSE index return’ are 49502.38, 0.000876, and 0.000899, respectively. The median is the middle-value robust measure of the center of the distribution that is less sensitive to outliers than the mean (COVID-19 cases= 26727.00, BSE index returns= 0.001866, NSE index returns= 0.001895). Maximum and minimum values of the series in the current sample are COVID-19 cases (414188.0, 0.00000), BSE index return (0.089749, -0.131526), NSE index return (0.087632, -0.129805). Jarque-Bera is a test statistic for testing whether the series is normally distributed. We reject the null hypothesis at 1% statistical significance level, that data is not normally distributed.

Unit Root Test

Unit root test is the most commonly used methodological procedure to examine the data series that satisfies stationary assumptions. In an effort to confirm such requirement, unit root test methodology was evolved. The Unit-Root test is conducted based on Augmented Dicky-Fuller (ADF) test. The ADF test is based on the following hypothesis:

The null hypothesis is $(y=0)$, i.e., y_t possesses a unit root.(1)

Table – 2: Augmented Dicky-Fuller (ADF) test for stationarity

	t-STATICS	PROBABILITY VALUE	UNIT ROOT
COVID-19-19Cases	-4.747773	0.0000	Stationary at [I (0)]
Return_BSE	-6.813174	0.0000	Stationary at [I (0)]
Return_NSE	-6.647369	0.0000	Stationary at [I (0)]

Results from Table 2 show that since the test statistic is much lower than all of the critical values, we can reject H_0 at a significance level $<1\%$. So we can conclude with a very low probability of making an error that our time series has no unit root. So, we can reject null hypotheses. In fact, the p-value for COVID-19 Cases, Return_BSE, and Return_NSE

are significant at p-value 0.000 and show that the datasets are significant at <1% level of significance. Hence all the series were stationary and had no unit root.

Granger causality test

$H_{1.0}$: There is no two-ways impact between COVID-19 cases and BSE Returns (2)

Table – 3: Granger Causality Test- BSE Return

Pairwise Granger Causality Tests			
Date: 01/06/22 Time: 21:10			
Sample: 1/30/2020 12/15/2021			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
COVID-19_CASES does not Granger Cause BSE_RETURN	464	0.53817	0.5842
BSE_RETURN does not Granger Cause COVID-19_CASES		0.17507	.8395

Based on the probability values reported in Table 3, the null hypothesis that COVID-19 Cases do not Granger Cause BSE Return is not rejected and BSE Return does not have Granger Cause COVID-19 Cases is not rejected, which implies that there is no relation between COVID-19 cases and BSE Returns one way or other way.

$H_{2.0}$: There is no two-ways impact between COVID-19 cases and NSE Returns (3)

Table – 4: Granger Causality Test-NSE Return

Pairwise Granger Causality Tests			
Date: 01/06/22 Time: 21:50			
Sample: 1/30/2020 12/15/2021			
Lags: 2			
Null Hypothesis:	Obs	F-Statistic	Prob.
COVID-19_CASES does not Granger Cause NSE_RETURN	464	0.51122	0.6001
NSE_RETURN does not Granger Cause COVID-19_CASES		0.17273	0.8414

Based on the probability values reported in Table 4, the null hypothesis that COVID-19 Cases do not Granger Cause NSE Return is not rejected and NSE Return does not have Granger Cause COVID-19 Cases is also not rejected, which implies that there is no relation between COVID-19 cases and NSE Return on one way or other way.

CONCLUSION

We examined the impact of COVID-19 cases on BSE and NSE daily stock returns for the period January 30, 2020, to December 15, 2021. We examined stationarity of data applying Unit-Root test based on Augmented Dicky-Fuller (ADF) test, found that the p-value for COVID-19 case, BSE return, and NSE return were significant at p-value 0.000 and shows that the datasets were significant at 1% level of significance, Hence all the series were stationary and have no unit root. According to the Granger causality tests presented in Table (3 & 4), we do not reject the null hypothesis, which implies that COVID-19 cases do not have any impact on BSE and NSE stock returns in India so we can conclude that there were some other factors than COVID-19 case that affect stock volatility.

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