



# COVID-19 Impact on the Select Financial Sector Indices

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## ABSTRACT

*This study specifically focuses on evaluating the effects of Covid-19 and the lockout it imposed on the Nifty sectoral indices, due to the financial sector's importance to the economy. For the period consisting of two sub-periods, the first sub-period from April 2019 to March 2020 are assumed to be the preCovid-19 period and the second sub-period from April 2020 to March 2021 is the post-Covid-19 period, the changes in the future responses of Nifty 50 to the changes in the select sectoral indices, namely, Nifty Bank, Nifty Financial Services, Nifty Private Banks, and Nifty PSU Banks were estimated using the OLS regression and, Granger Casuality. The findings showed that the Covid-19 shock had an impact on the financial sector indexes in India during that time.*

*Keywords: Nifty sectoral indices, preCovid-19, post-Covid-19, Nifty Bank, Nifty Financial Services.*

## 1. INTRODUCTION

India's financial sector, which consists of banks, non-banking financial institutions, and the insurance sector, has a significant impact on the actual economy. Since they generate credit and deploy savings, this serves as the foundation for investments, offers payment and fund transfer services to support businesses and consumers, opening up opportunities for economic growth. The stability of the markets and risk reduction depend heavily on the financial sector's performance.

The Covid-19 pandemic that spanned the world, and has transformed that many economic sectors operated. The announcement of the Covid-19 epidemic and the subsequent global lockdown have had a tremendous influence on all financial markets, including those in India. The policymakers are concerned about estimating the extent of the impact of Covid-19 shutdowns on the various sectors of the economy due to their worries that many businesses will go out of business, there will be an

increase in NPA, there will be a shortage of liquidity in the financial services sector, and capital flows will stop.

The banking industry, which employs equity markets to operate, has more access to financing, but the pandemic has affected its indexes globally and in India in particular. According to Business Standard, the Nifty, the top benchmark index of the National Stock Exchange (NSE) of India, was predicted to decline by 16 to 22 percent in April 2020. Due to the financial sector's importance to the economy, this study specifically refers to it in order to evaluate the impact of Covid-19 and the lockdown it imposed on the Nifty sectoral indices.

In earlier studies on evaluating the effect of COVID-19 on stock markets, the volatility was identified using a variety of models, including GARCH, and causality analysis implementing a variety of sectoral indexes and market benchmarks. This section includes a number of key studies that were conducted during the pandemic

for the Indian context and are comparable to the current study.

## 2. REVIEW OF LITERATURE

Agarwalla, Varma, and Virmani (2021) examined the effects of COVID-19 on the Indian stock markets by employing liquid Nifty index options traded at the NSE from 1st January to 31st May 2020. The study assessed the effect of Covid-19 on the tail risk and overall market uncertainty represented by the options market. It observed that there were noteworthy shifts in the first four moments of the risk-neutral distribution of the future stock market index.

Chuan, Mahdi, and Kenneth (2021) assessed the volatility of two Asian stock markets, Bursa Malaysia and Singapore Exchange, by dividing the data into pre-Covid-19 and during the-Covid- 19 and using the GARCH, GARCH-M, TGARCH, EGARCH, and PGARCH models for each of the subsamples. The findings demonstrated that both stock market returns were highly resilient and that during the pandemic, the persistence of both stock market gains dropped. Moreover, the normal distribution worked well for the stock markets in Malaysia and Singapore before the epidemic but changed to a Student's (skewed normal) distribution during the pandemic. The EGARCH(1,1) confirmed the presence of the leverage effect when stock market returns were negatively linked with its volatility, and the standard GARCH(1,1), GARCH-M(1,1), and EGARCH(1,1) performed well for both stock market returns.

Sahoo (2021) empirically examined the presence of the day-of-the-week impact by applying closing daily data for Nifty 50, Nifty 50 Midcap, Nifty 100, Nifty 100 Midcap, Nifty 100 Smallcap, and Nifty 200 for before and during the Covid-19. Secondary data for all indices over the period 1st April 2005 – 14th May 2020 was used and the dummy variable regression and the Generalized Autoregressive Conditional Heteroscedasticity (GARCH) model were applied to estimate the results. The results of the study found a negative return for Mondays during-Covid-19 and in contrast, positive returns were seen before the Covid-19 period. Tuesday's effect on index return was found to be statistically significant and positive for all indices during the Covid-19 crisis.

Abhinanadan, Sanath Kumar K, Dr. Yatish Kumar (2020) by applying Event study assess the effect of Coronavirus on the Indian Stock market. By using one of the key NSE indices, the Nifty 50, this study examined how the stock market responded. It was discovered that Covid-19 has a major impact on the Indian stock market, and that other variables also contributed to a brief decline in stock prices.

Bhatia and Gupta (2020) used asymmetric and symmetric models to examine the volatility of the Indian banking sectoral indices and the overall banking index while considering the shocking occurrences caused by Covid-19 and the Sub-prime Crisis. The findings of the study showed that these indexes' volatility was sufficiently strong to withstand the leverage effect that existed during the Sub-Prime Crisis in the market. In contrast to Public Sector Undertaking Bank Indices, this effect vanished for Nifty Bank Indices and Private Sector Bank Indices during COVID-19. This study recommended that investors might employ the diversification strategy over the long term to defend their portfolio values and withstand global shocks using the GARCH and EGARCH models.

Chaudhary, Bakhshi, and Gupta (2020) examined the effects of Covid-19 on the performance of the Indian stock market by using the two composite indices (BSE 500 and BSE Sensex) and eight sectoral indices (Auto, Bankex, Consumer Durables, Capital Goods, Fast Moving Consumer Goods, Health Care, Information Technology, and Realty) of the Bombay Stock Exchange (BSE). Using daily data from January 2019 to May 2020, they also compared the composite indices of India with the S&P 500, Nikkei 225, and FTSE 100 worldwide indices. The main results of the study showed lower mean daily return than specific, negative returns in the crisis period compared to the pre-crisis period using the GLS regression to analyse the impact of Covid- 19 on the different measures of volatility, including standard deviation, skewness, and kurtosis of all indices. The skewness was discovered to be negative, the kurtosis values were incredibly high, and the standard deviation of all the indices increased. The Indian stock market showed nearly the same standard deviation as the international markets, but the market appeared to be more volatile due to increased negative skewness and positive kurtosis of returns.



Guru and Das (2020) researched the effect of Covid-19 on the volatility spillovers of ten significant sector indices listed in BSE India. According to the report, overall volatility spillovers peaked in Covid-19 at 69%. The main net volatility transmitters were in the energy industry,

followed by the oil and gas industries. The stock market's volatility spillovers have been amplified by Covid-19. The largest net recipient of volatility spillovers from other industries continues to be FMCG.

Kulal and Kumar (2020) concentrated on studying the Covid-19 influences on the Indian stock market specifically, National Stock Exchange (NSE) and five sectoral indices. The results of the study reveal that there was a negative impact on the different indexes of NSE initially for one month due to COVID-19, afterwards there was recovery in the market and acted normally owing to the liquidity - driven market.

Patil, Parab, and Reddy (2018) investigated the influence of demonetization on NIFTY's sectoral indices: Nifty Auto Index, Nifty Financial Services Index, Nifty FMCG Index, Nifty IT Index, Nifty Media Index, Nifty Private Bank Index, and Nifty Realty Index. They employed the GARCH Model to depict its consequences on select sectoral indices. They inferred that the NIFTY Auto index was highly influenced owing to the demonetization declaration in India on November 2016.

### 3. SELECT FINANCE SECTORAL INDICES NIFTY 50:

The NIFTY 50 is a diverse 50-stock index that includes 13 economic sectors. It is employed for many different things, including benchmarking fund portfolios, creating index-based derivatives, and operating index funds. NSE Indexes Ltd, formerly known as India Index Services & Products Limited, is the owner and manager of the NIFTY 50. (NSE Indices).

#### **NIFTY Bank:**

The index is designed to reflect the behaviour and performance of the large and liquid banks. The index comprises of maximum of 12 stocks and base date of the index is January 1, 2000.

#### **Nifty Financial Services:**

The Nifty Financial Services Index, which measures the performance of the Indian financial market and comprises banks, financial institutions, housing finance,

insurance businesses, and other financial services, is intended to reflect market behaviour.

#### **Nifty PSU Banks:**

The performance of the public sector banks is intended to be reflected by the Nifty PSU Bank Index.

#### **Nifty Private Banks:**

The Nifty Private Bank Index was developed to reflect the performance of private sector banks.

### 4. OBJECTIVES OF THE STUDY

The main objectives of the study are

1. To determine the causal relationship between Nifty 50 and select sectoral indices.
2. To measure the changes in the future responses of Nifty 50 to the changes in the select sectoral indices.

### 5. DATA, VARIABLES, MEASUREMENT

Every economy, including India, revolves around the financial sector. The financial sector has been impacted by the Covid-19 pandemic and the lockdown that has been in place in India since March 2020 in both the short- and long-term. The industry encompasses the banking, NBFC, and insurance sectors, all of which are frequently involved in people's daily life. As a result of this key role, it is crucial to assess how Covid-19 has affected this industry and the indexes that are used on the BSE and NSE. This will help governments, investors, and policymakers predict the impact and develop a plan of action. So, the current study took into account the Indian banking industries of Banks, Financial Services, Private Banks, and PSU Banks. The variables were the Nifty Bank, Nifty Financial Services, Nifty Private Banks, and Nifty PSU Banks indexes.

The NSE website was utilized to collect the daily closing prices for Nifty Bank, Nifty Financial Services, Nifty Private Banks, and PSU Banks throughout a two-year period divided into two sub-periods. It is expected that the first sub-period, which runs from April 2019 to March 2020, represents the pre-Covid-19 period, and the second sub-period, which runs from April 2020 to March 2021, represents the Covid-19 period.

The Augmented Dickey-Fuller (ADF) and Phillips and Perron (PP) tests were used in the study's empirical analysis to first check for stationarity and see if a unit root existed. Second, the coefficients from the Normal Least Square Regression were computed; these

coefficients were then used to predict how the stock indexes will react in the future after the Covid-19. The Granger Causality test was run to evaluate the causal link.

## 6. FINDINGS AND DISCUSSIONS

Table 1 displays the descriptive statistics of the chosen stock indexes for the research period. The indexes' minimum and highest values showed a significant spread, which is a sign of extreme volatility. The variations in price movements shown in Figure 1 also showed that the prices of the stock indexes fell precipitously starting in March 2020 with the Covid-19 lockdown and continuing thereafter. The prices have increased over the Covid-19 period, but they have not yet reached their pre-Covid-19 levels, indicating the shock caused by the lockdown on this sector. The Nifty Bank index's highest mean value was discovered, indicating substantial volatility.

For the study, variables Nifty 50 and Nifty PSU Banks, the skewness is positive (right-skewed), which indicates that the mean is greater than the mode. For the study variables Nifty Bank, Nifty Financial Services, and Nifty Private Banks, the skewness is negative (left-skewed), which indicates that the mean is lower than the mode. This implied that the movements of the study variables were systematic and related to one another. The Nifty 50's positive and higher-than-three kurtosis coefficient values show that the distribution is leptokurtic. The kurtosis coefficient values for Nifty Bank, Nifty Financial Services, Nifty Private Banks, and Nifty PSU Banks are positive and smaller than three, indicating that the distribution is platykurtic with fewer, less extreme outliers. The results of the Jarque-Bera test and its probability therefore indicate that none of the study's variables are normally distributed.

Table-1: Descriptive Statistics of Select Financial Sector Indices

Particulars	Nifty 50	Nifty Bank	Nifty Financial Services	Nifty Private Banks	Nifty PSU Banks
Mean	11772.59	28687.06	13857.06	16251.15	2087.28
Median	11658.15	29385.97	12985.50	16322.05	2156.91
Maximum	15313.65	37306.28	17504.91	19865.54	3426.11
Minimum	7611.25	16917.68	8298.51	8993.70	1086.25
Std.Deviation	1631.11	4855.96	1989.99	2669.00	654.01
Skewness	0.28	-0.44	-0.06	-0.60	0.26
Kurtosis	3.36	2.11	2.39	2.07	1.86

Jarque-Bera	8.27	31.80	8.23	47.78	32.64
Probability	0.03**	0.00**	0.04*	0.00**	0.00**
Observations	500	500	500	500	500

\*\*Significant at the 5% level

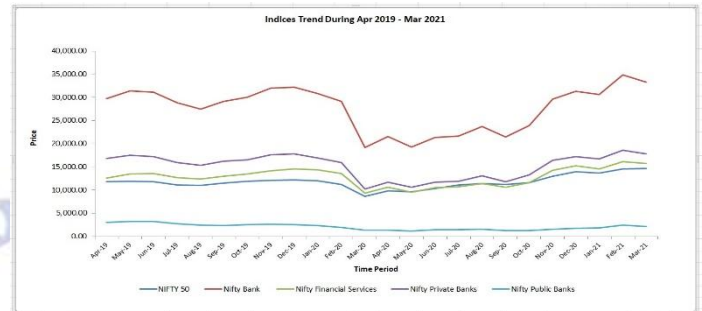


Figure-1: Graphical Representation on the Prices of the Select Sectoral Indices

### ADF&PP Unit Root Test

Table 2 displays the outcomes of unit root tests performed to determine whether the data were stationary. It is determined from the results of the Augmented Dickey-Fuller and Phillips-Perron unit root tests that all the research variables are found to be stationary at first difference I(1) series. As a result, all of the time series data are integrated in order I and statistically significant (1). Thus, it is clear that the study's data are stationary.

Table-2: Unit Root Test Results

Time Series Data	ADF Unit Root Test		PP Unit Root Test	
	Level	First Difference	Level	First Difference
Nifty 50	-1.15	-24.03**	-1.27	-24.07**
Nifty Bank	-0.94	-21.25**	-1.15	-21.36**
Nifty Financial Services	-1.12	-21.61**	-1.28	21.69
Nifty Private Banks	-1.04	-20.98**	-1.21	-21.07**
Nifty PSU Banks	-0.81	-21.68	-0.90	-21.69**

\*\*Significant at the 5% level

Table-3: Estimation of Regression Model

Independent Variables	Coefficient	Std. Error	t-Statistics	RSquare	Adjusted R Square	F-Statistics
Constant	3.78	2.73	1.39**	0.88	0.88	806.11
Nifty Bank	-0.17	0.07	-2.77**			
Nifty Financial Services	0.63	0.06	11.61**			
Nifty Private Banks	0.26	0.09	3.16**			
Nifty PSU Banks	0.43	0.09	4.67			

\*\*Significant at the 5% level



### Time Series Regression Analysis

In this study, a statistical technique called time series regression was employed to predict how the Nifty 50 index prices will respond in the future based on historical data from a few selected sectors indexes. Table 3 displays the outcome of the time series regression.

There are four significant bits of information in the regression output. The first thing to consider is the R2 value, which is based on the sample and represents the percentage of variance in Nifty 20 index prices that may be explained by the chosen sectoral indices taken into consideration in this study, and it shows how well the regression model fits the data. The R2 value must be 0.60 or above in order for a model to be considered fit. The R2 value in the regression model mentioned above, which is 0.88 and higher than 0.60, indicates that the model fits.

This implies that 87 percent of the variability in the price movements of the Nifty 50 index might be explained by select sectoral indexes. Second, by eliminating the positive bias, the adjusted R2 value produces a result that is consistent with what may be anticipated in the population. The model's adjusted R2 value is 0.88, which is the same as the R2 value. Third, the model's F value of 806.11 suggests that it is statistically significant at the threshold of 0.05. Finally, to build a model and predict the dependent variable (i.e., Nifty 50 index price, information on the coefficients for the constant and independent variables (i.e., select sectoral indices) is needed.

The regression model framed from the above regression results are as follows

$$\text{Nifty } 50_t = +3.78 - 0.17(\text{Nifty Bank}) + 0.63 (\text{Nifty Financial Services}) + 0.26 (\text{Nifty Private Banks}) + 0.43 (\text{Nifty PSU Banks}) + \epsilon_t$$

### Testing the Data for Causality

Hypothesis H01, there is no significant causal relationship existing between Nifty 50 and select financial sectoral indices.

The Granger causality test was used to ascertain the causal relationship between the Nifty 50 and the chosen sectoral indices, i.e., to see if the Nifty 50 is helpful in forecasting the chosen sectoral indices and vice versa, as well as to identify the chosen sectoral indices' short-run equilibrium relationship. Table 4 lists the outcomes of the Granger causality test for the Nifty 50 and a few selected sector indexes.

The Granger causality analysis results showed that there was a significant causal relationship between the Nifty 50 and the chosen sectoral indices in short term. A change in the Nifty 50 index both before and after Covid-19 had a considerable impact on the index prices for Nifty Bank and Nifty Private Banks, according to a unidirectional causation between Nifty 50 and Nifty Bank and Nifty Private Banks that was present. Furthermore, it was observed that during both the pre-Covid-19 and Covid-19 periods, there was a bidirectional causal relationship between the Nifty 50 and the Nifty Financial Services.

**Table: 4 Granger Causality Test**

Null Hypotheses	F-Statistic	Probability	Result
Nifty Bank does not Granger Cause Nifty 50	2.26	0.12	Accept
Nifty 50 does not Granger Cause Nifty Bank	3.12	0.04**	Reject
Nifty Financial Services does not Granger Cause Nifty 50	3.19	0.04**	Reject
Nifty 50 does not Granger Cause Nifty Financial Services	4.06	0.03**	Reject
Nifty Private Banks does not Granger Cause Nifty 50	2.18	0.13	Accept
Nifty 50 does not Granger Cause Nifty Private Banks	3.32	0.04**	Reject
Nifty PSU Banks does not Granger Cause Nifty 50	0.19	0.83	Accept
Nifty 50 does not Granger Cause Nifty PSU Banks	1.62	0.21	Accept

Note: Appropriate lag length was determined by the Akaike information criterion

\*\* Significant at the 5% level

### ECONOMIC IMPLICATIONS

Global stock markets fluctuate over a spectrum of volatility driven by information asymmetry shocks experienced over a range of time frames and changes in governmental policies. Investors and policymakers view the evaluation of the volatility in the performance of the stock market parameters as essential for forecasting and decision-making. The recent COVID-19 pandemic that shook the world has had an impact on many economic sectors, including the stock market, notwithstanding this.

### 7. CONCLUSIONS

A robust econometric approach was used in this work to investigate empirically the effect of COVID-19 on the financial sector indices of the NSE in India. The findings showed that COVID-19 and the shutdown in India had

an impact on the financial sector indices via the Nifty Bank, Nifty Financial Services, Nifty Private Banks, and Nifty PSU Banks, with the NSE Banks experiencing the largest volatility. There was a one-way causal relationship between the Nifty 50 index and the Nifty Bank and Nifty Private Banks index prices, indicating that changes in the Nifty 50 index both before and after COVID-19 had a significant influence on the values of the Nifty Bank and Nifty Private Banks indexes. Furthermore, it was discovered that during both the pre-Covid-19 and Covid-19 periods, there was a bidirectional causal relationship between the Nifty 50 and the Nifty Financial Services.

### Conflict of interest statement

Authors declare that they do not have any conflict of interest.

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