



A Study on Stock Market Behaviour of pre-covid and post-covid era

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Abstract

This study focuses on analyzing the stock market behaviour of sectorial indices of the National Stock Exchange (NSE) and Bombay Stock Exchange (BSE) in India during the covid-19 era. The study used exploratory and descriptive research design to compare the pre-covid and post-covid period to understand the pandemic's effect on stock market volatility and performance. Ten Indian stock market indices are selected for analysis the stock market behaviour. Data has been collected from 2017 to 2023, covering a period that includes the pre & post of the covid-19 pandemic. Descriptive statistics, correlation analysis, and t-test techniques are used to analyze the data. Findings reveal a significant increase in volatility post-covid-19 across all indices, with a significant shift in performance. Strong positive correlations are observed among certain indices, while others exhibit more variability. The study concludes substantial shift in performance across sectorial indices of the Indian stock market following the covid-19 era, providing valuable insights for investors, policymakers, and researchers.

Key words: covid-19, stock market behaviour, indices, volatility, performance

Introduction

The stock market is a critical component of the global financial system, which serves as a barometer of economic health and investor sentiment. Stock market has witnessed dynamic shifts in behaviour driven by various factors such as economic conditions, technological advancement, geopolitical events and company performance. However, the stock market experienced significant volatility and uncertainty due to the outbreak and the spread of the covid-19 pandemic. The prolonged and strict lockdown affected the country's economy which had an impact on the stock market. This study is focused on the market behaviour of the sectorial indices of NSE and BSE. The sectorial indices will reflect the performance of the sectors during the covid-19 period. The pandemic has affected various sectors in different ways. This study is an attempt to analyze the sector wise market behaviour in India during covid-19 era. The stock market behaviour is influenced by a

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wide range of factors, and its behaviour can be unpredictable. A comparative study of pre-and post-covid-19 era has been done to study the impact of a pandemic.

Literature Review

Dr. Avijit Sikdar (2021), The study focused on comparing the stock price return volatility, number of transactions, and delivery percentage of 50 BSE-listed companies across sectors like Pharma, Automobile, Industrial Products, Banking and Finance, and Consumer Goods. They looked at the pre-COVID period from September 2019 to March 2020 and the post-COVID period from March 2020 to August 2020. To analyze the data, they used statistical methods like paired sample t-test and measured volatility using the standard deviation of daily returns. The study founded that there were significant differences in the average daily share price, average daily return, daily number of transactions, and volatility between the pre-COVID and post-COVID periods for most sectors. However, they didn't observe any significant difference in the delivery percentage of traded shares.

Suchandana Dutta, Kaushal Sharma, Justin Pinto & Shamik Shetty (2021), they showed significant economic impact of the COVID-19 pandemic, particularly on the global financial market and the stock prices in the Indian financial markets. The study focused on ten stocks listed in BSE India and compares their daily closing prices before and during the COVID-19 period, from September 2019 to September 2020. The analysis revealed a sharp downward trend in most of the stocks during the COVID-19 period. The study applied a paired t-test to compare various measures of stock prices, such as mean, standard deviation, skewness, and kurtosis. These measures consistently showed a negative (downward) trend during the COVID-19 period, indicating a more bearish market during that time.

Vikas Gupta, Stripal Srivastava (2022), they investigated the daily closing prices of eight sectoral indices of Nifty before and during the COVID period. The pre-COVID period was FY 2019-20, and the during COVID period was FY 2020-21. They used descriptive statistics to analyze the market behaviour before and during covid-19. Nifty indices experienced negative returns before COVID-19, but then it showed a sign of recovery and positive returns during the COVID period. The study also found that the volatility was lower in FY 2020-21. The standard deviation was also founded to be lower in covid period in all indices except nifty bank. From the study it can be concluded that all the indices recovered from the loss suffered from the lockdown and exhibited a bullish trend in the FY 2020-21.

P. Bhanu Sireesha & T. Haripriya (2021), they examined the individual sectoral indices of the NSE to understand the specific impact of the pandemic. They used the Wilcoxon matched pairs test to observe the impact in short-term, medium-term, and long-term event windows. They found that sectors like Pharma, Health Care, and FMCG had a significant positive impact, while all other sectors experienced a significant negative impact. This study concludes that the pandemic had a maximum impact on the select indices during the short term, which started to slowly reduce as time passed.

Dr. Ashish Khandelwal (2022), they analyzed the market in two different situations: before and after COVID-19. They focused on market capitalization, stock market performance, and the recovery process. To analyze the data they used standard deviation, mean, coefficient of variation and correlation techniques. The study founded that there was initially a significant crash in investor's wealth due to the coronavirus scare. However, market rebounded during the lockdown, with many stocks gaining. This was attributed to increased investment habits and the opening of new demat and trading account. The study concludes that the stock market has not been heavily impacted by the pandemic, and it recovered rapidly due to positive corporate results and vaccination efforts.

Research Methodology

The main aim of the study is to analyze the overall impact of the covid-19 pandemic on stock market volatility and performance of stock. In the present study an exploratory research design and descriptive research design has been used for studying the impact of pre- and post-covid-19 pandemic on stock market performance of indices of Indian stock market. Data collection has been done through secondary data. The period of data collection is for seven years of indices listed in NSE and BSE. The data has been collected from Period of 2017-2023, i.e. 7 years. Because covid era ranges in that period which affects the performance of indices of Indian stock market. For the present study, researcher had used non-probability convenience sampling method. The population was taken from NSE and BSE. And the Sampling size was ten Indian stock market indices were selected which have been listed on NSE & BSE. They are NIFTY 50, NIFTY IT, NIFTY FMCG, NIFTY BANK, NIFTY COMMODITIES, BSE SENSEX, BSE IT, BSE FMCG, BSE BANKEX, BSE COMMODITIES. Descriptive statistics, correlation and paired test were employed.

Data Analysis and Interpretation

Descriptive statistics

Data analysis of pre-covid

Table 1.1: The descriptive statistics between indices from the year 2017 to 2020

	NIFTY 50	NIFTY IT	NIFTY FMCG	NIFTY BANK	NIFTY COMMODITIES	BSE SENSEX	BSE IT	BSE FMCG	BSE BANKEX	BSE COMM.
Mean	9.27	9.50	10.23	10.17	8.16	10.46	9.48	9.29	10.29	7.97
Standard Error	0.01	0.02	0.01	0.02	0.01	0.01	0.02	0.01	0.02	0.01
Median	9.28	9.57	10.27	10.19	8.16	10.48	9.55	9.31	10.30	7.96
Standard Deviation	0.09	0.17	0.09	0.12	0.10	0.10	0.18	0.08	0.12	0.12
Kurtosis	-0.17	-1.35	-0.01	0.08	7.19	-0.69	-1.37	0.53	-0.12	3.84
Skewness	-0.67	-0.52	-0.76	-0.57	-1.83	-0.44	-0.52	-0.85	-0.41	-1.03
Range	0.35	0.52	0.41	0.51	0.58	0.39	0.52	0.39	0.50	0.65
Count	39	39	39	39	39	39	39	39	39	39

Data analysis of post-covid

Table 1.2: the descriptive statistics between indices from the year 2020-23

	NIFTY 50	NIFTY IT	NIFTY FMCG	NIFTY BANK	NIFTY Commodities	BSE SENSEX	BSE IT	BSE FMCG	BSE BANKEX	BSE Commodities
Mean	9.67	10.21	10.57	10.46	8.51	10.88	10.22	9.57	10.59	8.43
Standard Error	0.03	0.03	0.02	0.03	0.04	0.02	0.03	0.02	0.03	0.04
Median	9.74	10.28	10.55	10.50	8.62	10.96	10.28	9.54	10.63	8.57

Standard Deviation	0.20	0.24	0.19	0.23	0.27	0.19	0.24	0.18	0.23	0.30
Kurtosis	0.41	1.45	-1.03	0.49	0.04	0.41	1.55	-1.00	0.52	0.46
Skewness	-1.10	-1.35	0.14	-1.14	-1.07	-1.10	-1.41	0.13	-1.17	-1.34
Range	0.81	1.01	0.68	0.91	1.05	0.80	0.98	0.64	0.89	1.11
Count	45	45	45	45	45	45	45	45	45	45

Interpretation

The descriptive statistics revealed significant insights into the performance of various indices in the Indian stock market, both pre- and post-COVID-19. Across all indices, there is a notable increase in volatility in the post-COVID-19 period compared to the pre-COVID-19 period. This is evident from the higher standard deviations observed in the post-COVID-19 period, indicating increased variability in stock returns. Additionally, the data distribution shifts from being flat to peaked in most indices, reflecting a more pronounced clustering of data around the mean in the post-COVID-19 period. Negative skewness is generally observed in both periods, suggesting a slight leftward skew in the distribution of returns. Overall, these findings indicated heightened market volatility and greater uncertainty in the post-COVID-19 period across all indices.

Correlation

Data analysis of pre-covid

Table 2.1: Correlation between indices from the year 2017 to 2020

	NIFTY 50	NIFTY IT	NIFTY FMCG	NIFTY BANK	NIFTY COMMODITIES	BSE SENSEX	BSE IT	BSE FMCG	BSE BANKEX	BSE COMM.
NIFTY 50	1									
NIFTY IT	0.84	1								
NIFTY FMCG	0.87	0.89	1							
NIFTY BANK	0.97	0.79	0.81	1						
NIFTY Commodities	0.16	-0.22	-0.12	0.11	1					
BSE SENSEX	0.98	0.89	0.89	0.97	0.02	1				
BSE IT	0.83	0.99	0.89	0.78	-0.26	0.88	1			
BSE FMCG	0.87	0.86	0.98	0.79	0.00	0.87	0.85	1		
BSE BANKEX	0.97	0.78	0.79	0.99	0.09	0.96	0.77	0.78	1	
BSE COMM	0.11	-0.25	-0.12	0.06	0.95	-0.01	-0.29	0.01	0.03	1

Data analysis of post-covid

Table 2.2: Correlation between indices from the year 2020-2023

	NIFTY 50	NIFTY IT	NIFTY FMCG	NIFTY BANK	NIFTY Commodities	BSE SENSEX	BSE IT	BSE FMCG	BSE BANKEX	BSE Commodities
NIFTY 50	1									
NIFTY IT	0.85	1								
NIFTY FMCG	0.89	0.57	1							
NIFTY BANK	0.97	0.77	0.91	1						
NIFTY Commodities	0.98	0.87	0.85	0.94	1					
BSE SENSEX	0.99	0.85	0.89	0.98	0.97	1				
BSE IT	0.87	0.99	0.59	0.78	0.88	0.86	1			
BSE FMCG	0.89	0.57	0.99	0.91	0.85	0.90	0.59	1		
BSE BANKEX	0.98	0.78	0.90	0.99	0.95	0.98	0.79	0.90	1	
BSE Commodities	0.94	0.92	0.74	0.90	0.97	0.94	0.93	0.75	0.90	1

Interpretation

The correlation analysis revealed insights into the relationships between different indices in the Indian stock market, both pre- and post-COVID-19. While some indices exhibit negative correlations with each other in certain cases, indicating an inverse relationship in returns, all indices showed positive correlations overall. Particularly strong positive correlations are observed among NIFTY 50, NIFTY IT, NIFTY BANK, BSE SENSEX, BSE FMCG, and BSE BANKEX, with values ranging from +0.8 to +0.9 in both periods. This suggests a strong tendency for these indices to move in the same direction. Conversely, NIFTY COMMODITIES, BSE IT, and BSE COMMODITIES exhibited significant changes in performance across both periods, indicating greater variability in their relationships with other indices.

T-test: Paired Two Sample for Means

SUMMARY TABLE OF T-TEST: PAIRED TWO SAMPLE FOR MEANS

Indices	Impact
NIFTY 50	Positive
NIFTY IT	Positive
NIFTY FMCG	Positive
NIFTY BANK	Positive
NIFTY COMMODITIES	Negative
BSE SENSEX	Positive
BSE IT	Positive

BSE FMCG	Positive
BSE BANKEX	Positive
BSE COMMODITIES	Negative

Interpretation

The t-test paired two-sample for means analysis indicated significant shifts in performance following the COVID-19 period across all indices. For NIFTY 50, NIFTY IT, NIFTY FMCG, NIFTY BANK, BSE SENSEX, BSE IT, BSE FMCG, and BSE BANKEX, the t-statistic values are negative and the p-values are less than 0.05, suggesting a rejection of the null hypothesis. This implies a significant difference between the mean values of the pre-COVID and post-COVID periods, with positive correlations observed, indicating a positive impact or change in performance. However, for NIFTY COMMODITIES and BSE COMMODITIES, the t-statistic values are negative, and the p-values are less than 0.05, suggesting a rejection of the null hypothesis. Additionally, negative correlations are observed, indicating a negative impact or change in performance. Overall, these findings highlight the significant shifts in performance across various sectors of the Indian stock market following the COVID-19 period.

Conclusion

From the study it can conclude that the stock market experienced significantly volatility and fluctuations in the covid-19 pandemic. Before the pandemic, the stock market was generally stable and experienced steady growth. However, post-COVID, we saw increased volatility and uncertainty in the market. The study analyzed specific sectors performance to understand the varying impacts of covid-19 pandemic. From the analysis of descriptive statistics, it can be said that indices showed higher volatility in post-covid period compared to pre-covid period. From the results of correlation analysis, it can be said that some indices showed positive relationship with each other while some showed negative relationship with each other. And from t-test analysis the hypothesis was rejected in all indices and there was positive impact or change, showing a recovery or adaption to pandemic challenges. However, sector such as commodities experienced a negative impact, emphasizing the varied sector-wise effects of the pandemic. Overall, it can be said that post-covid era has been marked by significant fluctuations and shifts in stock market behaviour.

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