

Covid-19 Impact on the Stock Returns of the Indian Hotel Industry

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ABSTRACT

The COVID-19 pandemic had a significant influence on the functioning of all the impacted countries. Lockdowns were imposed, and the economy suffered greatly as a result. The tourism industry was among the worst-hit sectors, where the operations halted at one point. As a result, another industry that suffered the most was HORECA (i.e., hotels, restaurants, and catering). The lack of investor confidence during the pandemic led the stock values to fall precipitously. The purpose of this research is to, thus, determine the impact of the pandemic on the stock returns of the Indian hotel industry. A comparison with other Indian indices was done to see if the Hotel business suffered more than others. To quantify the influence on the test sector, event research methodology, ANOVA test, Beta Index, and other statistical measures were applied. According to the event study methodology, the Hotel industry produced considerable abnormal returns during the event phase. Some of the companies included in this article sustained substantial losses as a result of reduced operations, and their stock values observed changes by more than 50% as a result. There was a lack of investments given the reduced domestic and international tourism, public fear, nationwide lockdown, negative sentiments, inflated losses, and other many other factors. It is derived from the study that the adverse impact was seen on hotel stock prices, and that stocks would react similarly in the future. The research further discusses its comparison to the healthcare sector, which accrued to a high demand for vaccines and healthcare services. We establish high positive returns from the observation.

Keywords: Covid-19, Pandemic, Stock Returns, Healthcare, Hotel Industry, Indian Markets.

1. Introduction

1.1 SARS-CoV-2

Coronavirus disease (COVID-19) is a contagious respiratory ailment caused on by a recently identified coronavirus. It was initially identified in December 2019 in Wuhan, China (WHO, 2020) From there, it quickly spread to other parts of China.

On January 30, 2020, in Kerala, a COVID-19 confirmed positive case was reported for the first time in India. Following that, new confirmed cases were recorded in other Indian cities over the course of a month.

Lockdowns were announced on March 23 in Kerala and on March 25 in the rest of the nation. In September, infection rates began to decline. Over 90,000 instances were reported daily at their peak in mid-September, before falling to under 15,000 in January 2021. A second wave that started in March 2021 was far more destructive than the first, and states experienced shortages of medical supplies such as vaccines, hospital beds etc. India had the most recent and active cases worldwide by the end of April.

It was the first nation to report more than 400,000 new cases in a 24-hour period on April 30, 2021.

According to experts, the virus may persist in India in some form rather than entirely disappear. According to Soumya Swaminathan (Chief Scientist, WHO), India is in a stage of endemicity and the nation is adapting to live with the virus as by late August 2021.

1.2 Covid effect on India's Economy

India's GDP fell significantly by 24.4 percent between April and June 2020. Based on the most recent estimates of national income, the economy shrank by 7.4 percent in 2020-21 fiscal year (July-September 2020). Also, time period from October 2020 to March 2021 saw only 0.5 percent and 1.6 percent GDP growth, respectively. This implies that India's overall rate of contraction (in real terms) was 7.3 percent for the entire 2020 -21 fiscal year. (Source – Economics Observatory).

The initial COVID-19 effects on air transport, cruises, and lodging were found to be disastrous (Gossling et al. 2020).

The urban unemployment rate (Figure 2) increased to 20.9% in the April-June quarter of 2020, more than doubling the rate in the same quarter the previous year (8.9%). (Kumar et al. 2021)

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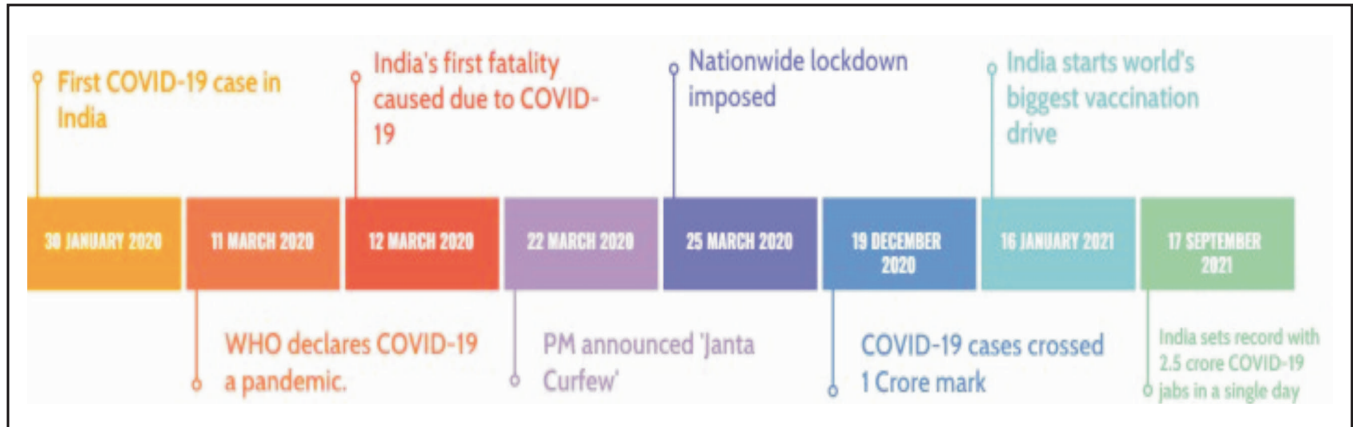


Figure 1 : Timeline of COVID-19 related events in India*

Source : <https://indianexpress.com/article/india/covid-19-india-timeline-looking-back-at-pandemic-induced-lockdown-7241583/>

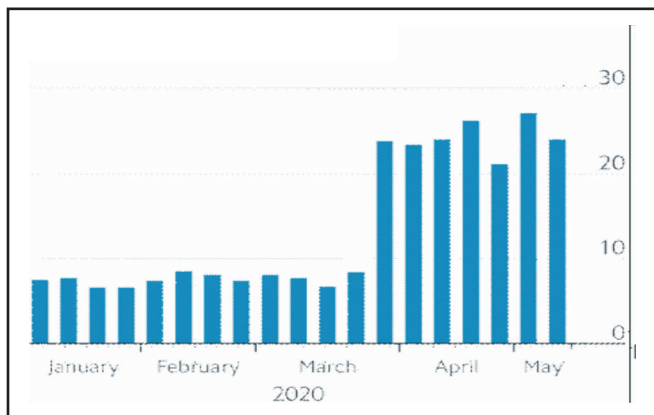


Figure 2 : India's Unemployment Rate, %

Source : Centre for monitoring the Indian economy

In India, both wealth and income inequality are increasing (Ghatak, 2021). According to estimates, 42.5% of total wealth was held by top 1% of the population, while the bottom 50% held only 2.5%. (Oxfam, 2020). Following the pandemic, the number of poor people in India is expected to more than double, while the number of middle-class people is expected to fall by one-third (Kochhar, 2021). Individual income dropped by 40% during India's first stringent national lockdown, which took place between April and May 2020. Three months' pay was lost by the bottom decile of households. (Azim Premji University, 2021; Beyer et al. 2021).

1.3 Covid Impact on the Hospitality Sector

The hospitality sector is one of many industries that make up the service sector, and it includes hotel, food and beverage service, event planning, theme parks, travel, and tourism. It has lodging, travel businesses, restaurants, and bars.

One of the areas most affected by the COVID-19 pandemic is hospitality sector. Numerous workers in the sector have lost their employment, but they have also seen important shifts in how jobs should evolve. India, Europe, and China are among the nations where the hospitality

sector has been struck more than in other regions. The United States has also suffered unprecedented cancellations and a severe business downturn in the past six months. (Gaurav Yalmame, 2022) Global travel advisories, visa suspensions, and the imposition of Section-144 (prohibition on mass gatherings) prompted India, like most other countries, to implement a lockdown, the consequences of which are unprecedented. (Mohan et al. 2020)

This study aims to find out the impact of the pandemic on the stock returns of the hotel sector. As its operations almost came to halt, it was obvious that the stock prices would fall due to investors losing confidence in the stock due to the fear of minimised revenue and increased losses. We will study this impact through the stock prices in the three-phase - Pre covid, During covid and Post covid period.

Another finding is that the healthcare industry expands during pandemics as a result of increased activity and turnover. In the twenty-first century, when people travel frequently for job or pleasure, the time it takes for the disease to spread to other regions of the world is also extremely short. Infectious diseases have an impact not only on humans, but also on a country's and organization's economic and financial health. (Mayer, 2000; Zhang et al. 2009). The Pandemic led to the increased operations of the hospital industry and hence, a better effect on the stock prices also. Stocks of the Companies which were key players in vaccine production ought to have risen with increasing investor confidence and sentiments.

2. Literature Review

The effect of the SARS outbreak on the performance of Taiwanese listed hotel stocks was examined by Chen et al. in 2007. The authors get to the conclusion that the returns of Taiwanese hotel stocks using an event research technique prior to and following the SARS outbreak revealed significant unfavourable cumulative mean abnormal results, indicating a significant adverse impact of the SARS

outbreak based on the performance of hotel stocks.

The SARS outbreak had an impact on Taiwanese hotel stock returns, not only because the hotels lost business, but also because they had to increase their discounts (Chen, 2010). In addition to the tourism industry, other sectors that suffered significant negative effects included investment, retail sales, restaurants, hotels, and the air transportation industry (KeoghBrown & Richard, 2008).

However, when outbreaks of enterovirus 71, dengue fever, SARS, and H1N1 occurred, Taiwanese biotechnology equities showed noticeably positive cumulative abnormal returns.

Wang and colleagues (2013) This demonstrates the hospital industry's favourable business conditions during such health crises. The Ebola epidemic in Africa also resulted in disinvestment from equity mutual funds, which grew in tandem with media coverage. (Alfonso Del Giudice & Andrea Paltrinieri, 2017).

In order to contextualise the COVID-19 outbreak and its impact on tourism, industry, and consumer response, Hall et al. (2020) conducted a thorough study of pandemics. According to the study, there will be uneven changes to the tourism industry as some destinations reevaluate the nature of this sector and concentrate on locally owned and operated tourism with the fewest institutional and governmental intrusions. In their analysis of the COVID-19 outbreak's effects on the US stock market, Chowdhury and Abedin (2020) used the GARCH, VAR, and event study methods to calculate the effects of COVID-19. The analysis comes to the conclusion that confirmed and fatality cases related to COVID-19 caused a negative reaction in the US stock market. Awadhi et al. (2020) estimate the effect of the pandemic on Chinese stock market using panel data regression analysis.

The analysis revealed that the increasing number of confirmed cases and deaths caused by COVID-19 had a significant negative impact on the stock market. Chi-Chuan Lee investigated the hotel industry in China in a similar study.

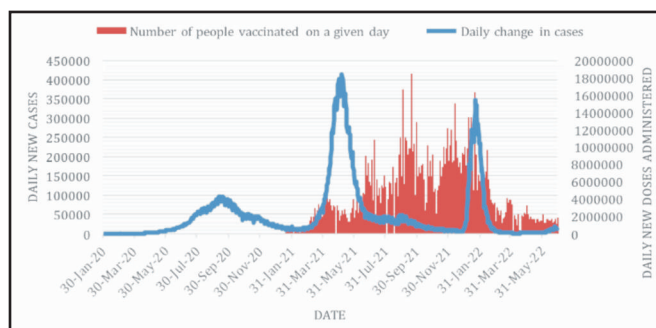


Figure 3 : Daily change in COVID-19 cases and vaccinations in India (Data has been compiled by the Author)

Source : <https://ourworldindata.org/covid-vaccinations>

Sims' (1980) SVAR analysis was used to determine the impact of COVID-19 and its relationship with hospitality stock returns.

The spread of the COVID-19 pandemic has a major positive effect on exchange rates while having an adverse impact on financial markets and hospitality business returns. (Lee et al. 2020)

The impact of covid on the Indian Healthcare sector has been analysed by Mittal et al. (2021) using an event study methodology.

The paper provides useful insights into how the healthcare and pharmaceutical industry boomed during the outbreak of COVID-19.

This study aims to examine how the SARS-CoV2 outbreak influenced stock performance in the healthcare and pharmaceutical sectors in relation to predicted returns from those sectors and to the normal market returns throughout the event period.

There are hardly any research papers that explore the impact of the pandemic on the stock returns of the Indian hospitality industry.

Singh (2020) explores the area through an event study approach limited to only one time period.

However, this approach focuses on the pre covid, covid as well as the post covid period to better analyse the situation.

Also, a comparison has been conducted with different sectors like BSE Sensex, healthcare etc. The extensive use of data visualization techniques made this paper easy to comprehend.

3. Advantages and Significance of the Study

3.1 This event study will help us learn :

- The impact of an unprecedented event on the stock market of India.
- The severity of the impact on specific sectors such as hotels and the healthcare sector.
- Effect on individual companies directly related to the event.

3.2 This study will help give us a deeper understanding of the impact of the outbreak, the historical price actions of the companies and post covid recovery.

3.3 Various statistical tools and infographics will be used for accurate analysis with minimum error.

4. Research Methodology

We have used a secondary method of data collection of the historical stock prices and indices. The index taken in the study is the Business Standard Hotel Index which consists of seven companies.

It contains the main players in the hotel industry with a combined market capitalisation of over INR 53,249 crores as on 30 June 2022. This is a credible index as it measures the performance of the top hotel stocks with high trading

Table 1 : BS Hotel Index used in the Analysis

S No.	Company Name	Code	Listing	Current Market Price (Rs)***	Market Value (Rcrores)***
1	Lemon tree Hotels	541233	BSE/NSE	60.9	48.16
2	Chalet Hotels Lrd	542399	BSE/NSE	313.7	64.56
3	EIH Ltd	500840	BSE/NSE	124.65	77.92
4	Indianhotels.co ltd	500850	BSE/NSE	225.15	319.87
5	Royal Orchid Hotels Ltd	532699	BSE/NSE	135	3.72
6	Taj GVK	532390	BSE/NSE	134	8.37
7	Oriental Hotels Ltd	500314	BSE/NSE	55.85	9.89

*** as on 30 June 2022

Source : https://www.business-standard.com/article/markets/covid-19-impact-no-comfort-in-hotel-stocks-as-recovery-pushed-to-fy23-120050701306_1.html

activity. It will help us grasp the position of the entire hotel industry through these securities. The prices of the stocks used for analysis throughout the study are the closing prices on a given day. The information used was obtained from the Bombay Stock Exchange’s official website. It is the eighth largest stock exchange in the country, with a total market capitalization of INR 2,43,73,732.88 crores as of 30 June 2022.

The BSE was Asia’s first stock exchange, and it also contains an equity trading platform for small and medium-sized businesses. BSE has expanded into other capital market services such as clearing, settlement, and risk management.

It is one of the most credible sources for analysing market trends of stocks as well as indices. We have used various BSE indices such as BSE SENSEX, BSE Auto, BSE Healthcare, BSE Finance etc. in our study.

The study has been divided into 4 different objectives as specified below:

a. Objective 1

The primary aim of the study is to analyse the effect of the event (pandemic) on the stock returns of the hotel industry. We use 3 different time periods for the same -

- Pre-covid era: 1 October 2019- 31 October 2019
- Covid era: 1 March 2020- 30 April 2020
- Post-covid era: 1 April 2022- 30 April 2022

The historical data of the stocks has been collected from BSE official website. We calculate the percentage change from the 1st day of the period as the base. Using this, we can analyze the cumulative impact of the industry stocks.

To calculate the index as a whole, we have taken the average daily percentage change of all the stocks on a given day. Further, we have used graphs, ANOVA Test and a data table showing the profit/loss comparison in different periods.

b. Objective 2

The next objective is to measure the downfall with respect to other BSE sectors. This analysis would indicate the severity of the covid on the hotel sector as compared to other sectors. Healthcare may show a positive return while other indices may show a negative trend. This analysis would help give us the plight of the hotel sector in the covid time. We have used a return table as well as line graphs with respect to other sectors including BSE Auto, BSE Finance, BSE Sensex, BSE Healthcare, BSE Consumer Durables, BSE FMCG and BSE Bankex.

It will show whether a sector has underperformed or outperformed during the given time periods.

c. Objective 3

This is a crucial objective which emphasizes the negative returns of the hotel sector in comparison to the market as a whole. An event study methodology (ESM) has been applied to study the impact of COVID-19 on Indian hotel stock performance. ESM is used extensively by researchers to assess the impact of an economic event or any announcement on the stock performance of the firm (Chen et al. 2007; Goker and Karaca, 2020; Impact of Covid-19 on Stock Returns of Hotel Industry... 107 Liu et al. 2020).

We have used the following regression model to calculate normal returns and expected returns:

$$ER_{k,t} = \alpha_k + \beta_k R_{m,t} + \epsilon_{k,t}$$

$$ER_{k,t} : R_{m,t} = \ln \left(\frac{price_t}{price_{t-1}} \right) \times 100$$

Where,

$ER_{k,t}$ = Expected returns of the stock ‘k’ on day ‘t’

$R_{m,t}$ = Market return of BSE SENSEX given day ‘t’

β_k = unbiased beta coefficient

α_k = intercept

The abnormal return (AR) is calculated as :

$$AR_{k,t} = R_{k,t} - ER_{k,t}$$

$R_{k,t}$ = Normal or actual return.

The market model and Ordinary Least Squares are used to calculate the expected return (OLS). CAR turning negative from positive over time and gradually increasing implies that the test sector outperformed market and produced conflicting results.

d. Objective 4

After our analysis of the previous objectives, we observe that the healthcare sector outperformed SENSEX by a great margin and also, the hotel sector underperformed significantly during the covid phase. Therefore, in our further study, we analyse the stock trends of both sectors. We observe the % change and also try to find out the reasons causing these changes. Some individual companies who were directly affected by the covid boomed more than other healthcare companies while some companies in the BS hotel index underperformed the index. We aim to analyse the rationale for the same as well as examine the quantitative changes in stock prices. We have used tables and graphs to demonstrate the same. The Pearson’s correlation coefficient and the Beta index are calculated to evaluate the intensity of change and volatility with respect to the index.

The formula used for the calculation of the beta index is as follows :

$$\beta = \text{covariance}(p_i, p_{bm}) / \text{variance}(p_{bm})$$

Where,

p_i = price of security ‘i’

p_{bm} = price of the benchmark index (i.e., BSE Healthcare).

5. Results and Findings

As stated above, we have used different time frames to analyse these objectives. We have used various statistical tools and data visuals which help us to evaluate the findings better. The empirical findings of the objectives are as follows:

Objective 1 – Changes in stock prices of the Hotel sector in the three given phases

By looking at the historical data of the different companies in the hotel sector, we can find the average percentage change in the three periods - pre covid, during covid and post covid.

Also, all the companies suffered a huge loss in the covid period while it managed to sustain profits in the pre covid period. Lockdowns, restrictions on travel and tourism, fear of going out in the pandemic, etc. might be some of the factors that affected the hotel and restaurant industry.

Table 2 shows the profits and losses of the BS Hotel companies and the percentage change from the start of the month.

The profits and losses in our study has been retrieved from financial statements posted on the company’s websites. While all the companies had profits in the pre covid period, they suffered huge losses amid the COVID-19 pandemic.

We can also see the post-covid recovery as the restrictions were relieved and the same has been reflected in the stock prices. We can observe a staggering fall in the stock prices as the hotel industry fell by over an average of 37% in the covid period (refer fig. 3).

The pre covid and the post covid monthly returns changed in the range from 0 to 7% while it changed 40% in the covid graph. This clearly shows the effect of the event.

Lemon tree and chalet hotels faced the impact more severely as they fell by a whopping 65% and 55% respectively. The main reason for the same would be later discussed in Objective 4.

We can also see a sumptuous post-covid recovery, as the changes in the stock prices are significantly higher than even in the pre-covid era. Following the second wave of the pandemic, demand has recovered sharply, aided by the relaxation of regulations during the July-September duration. “While the first few months were impacted, the

Table 2 : Information of Hotel Companies in different time periods

Company Name	PRE COVID			COVID			POST COVID		
	% Change from the month start	Share price (INR) as on 31 Oct 2019	Profit/Loss for Q3 (Oct-Dec 2019)#	% Change from the start	Share price (INR) as on 30 April 2020	Profit/Loss for Q1 (April-June 2020)#	% Change from the month start	Share price (INR) as on 29 April 22	Profit/Loss for Q4 (Jan-March 2022)#
Lemon Tree	7.82%	61.3	110.66	-65.625	17.6	-605.56	3.75	66.4	-387.44
Chalet	1.87	326.45	333.86	-54.57	148.25	-323.13	-2.59	298.45	-114.56
Eih	-5.52	167.5	1004.6	-40.91	75.8	-1464.7	0.75	160.45	285.7
Indian Hotels	-0.68	152.2	2,132	-40.23	79.85	-3,126	6.23	256.25	715.70
Oriental	-3.58	34.95	46.5	-30.98	17.15	-234.2	0.62	64.75	12.8
Royal Orchid	-5.15	80	56.67	-22.77	45.6	-138.92	8.08	137.7	316.7
Taj gvk	-5.98	166.6	111.4	-8.86	129.05	-168.9	6.23	169.65	27

In million rupees, Consolidated

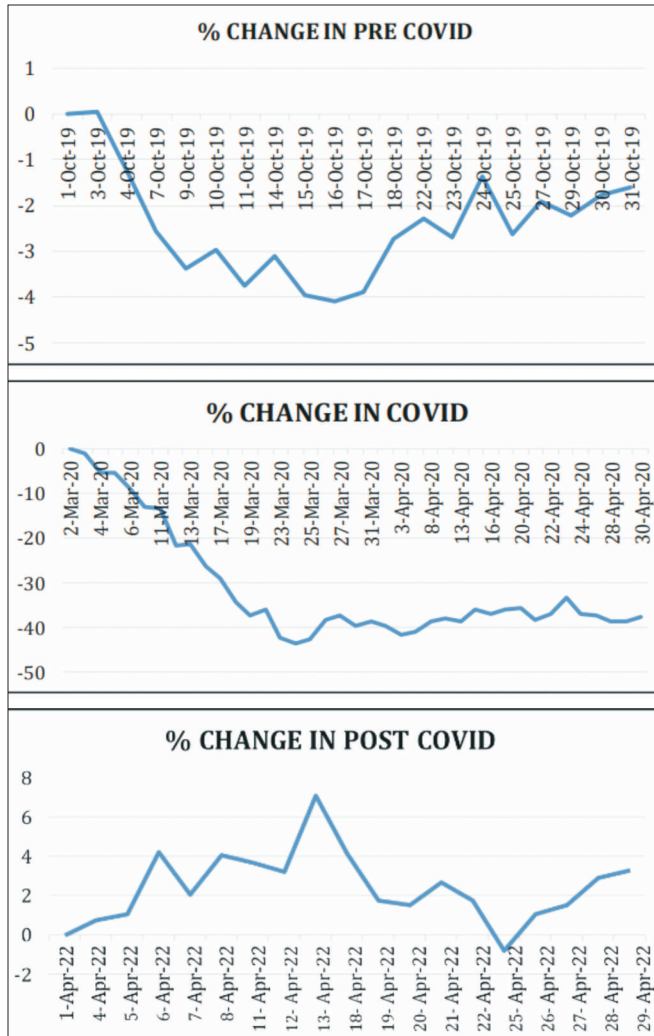


Figure 4: Average percentage change of Hotel Companies over the time

industry witnessed faster-than-expected ramp-up in second-quarter FY21, because of lower restrictions, high vaccination pace and pent-up demand, which resulted in revenge travel. Demand in the last few months has come from staycations, weddings and travel to driveable leisure destinations, and from special-purpose groups,” Iera Assistant Vice President and Sector Head Vinutaa S said. (Source: Business Standard). From mid-April through mid-June 2021, the demand for Covid was high, but it started to wane in July. People were fearful of the new wave and efficacy of the vaccines was still not determined.

Objective 2 – Comparison with different sectors using BSE indices

We have looked into the change in the hotel sector during covid and we have inferred that there was a great impact on the industry with respect to profitability as well as the stock returns.

However, what if the impact was on all the sectors and not only on the hotel sector? Since the operations almost came

to zero for the hotels in the pandemic, shouldn't there be more impact in comparison to other sectors?

Table 3 : Percentage returns of different BSE Sectors

INDEX	1Month Return (%)		
	PRE-COVID	COVID	POST-COVID
BSE AUTO	13.49	-13.5	3.45
BSE SENSEX	4.76	-11.6	-3.74
BSE IT	-0.1	-6.02	-12.29
BSE HEALTH CARE	7.06	14.27	-0.08
BSE FINANCE	4.77	-23.65	-4.05
BSE CONSUMER DISCRETIONARY	3.95	-20.98	0.57
BSE BANKEX	4.78	-25.34	-2.49
BSE FMCG	5.09	-1.33	4.23
HOTEL INDEX	-1.6	-37.71	3.29

These questions would be investigated in this section. We have taken BSE SENSEX as well as BSE sectoral indices for our study. Only two sectors have shown a decent response during the COVID. BSE FMCG sector lost only -1.3% return and the BSE Healthcare sector grew by 14.27%. This is a noteworthy finding as when all the sectors suffered the plight, the healthcare sector outperformed by a significant margin.

Table 3 examines the return in the specified periods. BSE SENSEX, which is an index representing the top 30 companies on Bombay Stock Exchange, gave a negative return of -11.6% while the hotel sector delivered a -38% return. Hence, The BS Hotel sector significantly underperformed the market. Note that the time period for the section is same as that in the previous objective. BSE Finance, BSE Consumer Discretionary, and BSE Bankex lost more than 20% whereas the healthcare sector increased by over 14%. The premises for the same will be discussed in Objective 4.

Furthermore, BSE Auto faced significant returns in October 2019 while BSE IT suffered in the period after the covid. The rise of bear run in the IT market can be attributed to the Russia- Ukraine war, negative sentiment around the Q4 earnings season and distrust among FIIs (Thapliyal, 2022)

To look for the variations in prices in Pre Covid, Covid and Post covid, we have used ANOVA:Single factor test which is an important tool compares the means of groups in order to determine if there is a difference between them.

We formulate the Hypothesis for the test as follows:

H_0 = There is no variation in the stock prices of the test industry due to Covid.

H_1 = There is a variation and an impact of Covid on the stock prices of the test industry.

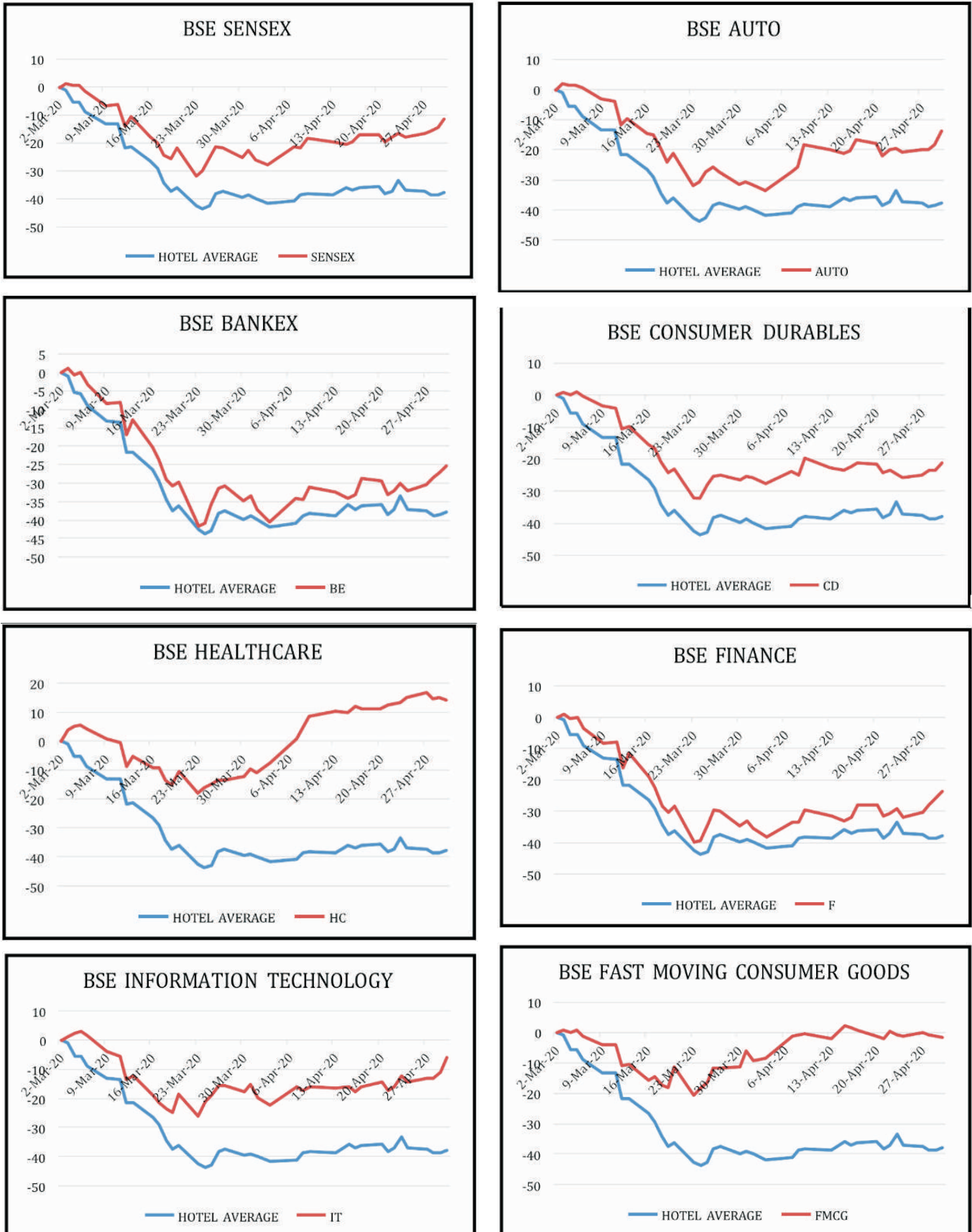


Figure 5 : Time-series comparison of changes of different BSE sectors with the hotel sector in the COVID

Table 4 : ANOVA Test - Hotel Sector

SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
PRE	18	17726.6	984.8111	188.2037		
COVID	18	9433.65	524.0917	236.5483		
POST	18	20512.55	1139.586	551.0538		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	3690307	2	1845153	5672.707	1.25E-60	5.04721
Within Groups	16588.7	51	325.2686			
Total	3706895	53				

Table 5 : ANOVA Test - BSE Sensex

SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
PRE	18	694656.2	38592.01	398060.2		
COVID	18	557388.2	30966.01	2110008		
POST	18	1048091	58227.25	1651996		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	7.12E+09	2	3.56E+09	2567.716	6.51E-52	5.04721
Within Groups	70721103	51	1386688			
Total	7.19E+09	53				

Table 6 : ANOVA Test - BSE Healthcare

SUMMARY						
<i>Groups</i>	<i>Count</i>	<i>Sum</i>	<i>Average</i>	<i>Variance</i>		
PRE	18	224985.3	12499.18	122652.2		
COVID	18	263421.1	14634.51	1071283		
POST	18	444293.4	24682.96	64720.04		
ANOVA						
<i>Source of Variation</i>	<i>SS</i>	<i>df</i>	<i>MS</i>	<i>F</i>	<i>P-value</i>	<i>F crit</i>
Between Groups	1.52E+09	2	7.62E+08	1816.05	4.02E-48	5.04721
Within Groups	21397147	51	419551.9			
Total	1.55E+09	53				

Table 7 : Summary of the ANOVA test for three sectors

Sector	p-value	F value	F critical	Decision
Hotel	1.246E-60	5672.707	5.0472102	REJECT
BSE Sensex	6.515E-52	2567.716	5.0472102	REJECT
BSE Healthcare	4.023E-48	1816.05	5.0472102	REJECT

We have taken N as 18 trading days in the months of October 2019, April 2020, and April 2022.

Also, note that all the analysis are done using 99% confidence interval.

From the above Summary, we can observe the sum and average of the hotel index varies extensively in the pre-covid, covid and the post covid groups. Furthermore, the variance in the covid group is the highest as stock price depleted in that era at a very fast pace. There was no considerable variation in the pre-covid and the post-covid phase as no such event took place in the specified time period. While the average came down to Rs 660 in the covid, it recovered in the post covid phase, even higher than pre covid. This indicates the hope among the investors owing to the increased revenge travelling and vaccination rates.

The p-value is **1.25E-60** which is substantially lower than the alpha level of **0.01**. In addition, the F value (**5672.7**) is much higher than F critical (**5.05**), telling us that the test is statistically significant at 99% confidence interval. This means that there is a huge difference between the groups.

Hence, we can reject the null hypothesis and infer that the COVID-19 outbreak caused a lot of variation in the three time periods, a downfall in the pandemic and a huge rise (recovery) after covid. Similarly, we conduct the ANOVA test for *BSE Sensex and further, BSE healthcare*.

We can summarise the analysis using the Table 7.

All the results were statistically significant at the 99% confidence interval. The p-values are too far and less from the alpha value of 0.01. The maximum variation in the prices is in the Hotel industry as derived from the F value and variance. Thus, the hotel industry suffered more than the market as well as the healthcare industry. This may be due to the fact that the Healthcare industry had a minimised effect and therefore, lesser variation in the stock prices in Covid.

Objective 3 – Measuring Abnormal returns using Event Study Methodology

Now we apply event study methodology (ESM) to examine the relationship between the lockdown imposed by the government due to the pandemic and the test sector. Ball and Brown developed the event study in 1968. It is a critical study to assess the effect of a particular event on the firm's value. The goal is to find the abnormal returns attributable to the event caused by market price fluctuations. We have taken the first covid case reported in India on 30th January 2020 as the event. If there would be no abnormal returns, we can conclude that COVID-19 did not have any influence on the hotel market.

The study starts by making an assumption as to what the hotel stock returns would have been in the absence of the COVID-19 incident. Stock price changes brought on by any specific event are distinguished from market changes

in the ESM hotel. The term "abnormal return (AR)" refers to the price changes attributed to a specific event, such as COVID-19. By subtracting the expected return (ER) from the actual return, an abnormal return is calculated. In the event of good news, we expect ARs to be positive, while in the event of bad news, ARs are expected to become negative. Positive ARs show that the market expects the event to boost the firm's value, whilst negative ARs show that the market expects the event to diminish the firm's value. We have taken the estimation period as 1st August 2019 to 29th January 2020 (121 trading days) and the event window is from 2nd January 2020 till 27th February 2020 (41 trading days). The event period is divided into two - The pre-event period (20 days prior to covid) and the post-event period (20 days after the first case of covid in India). Therefore, the event is analysed in the time frame (-20,20) days. Further, BSE Sensex is the benchmark index taken for the comparison using regression analysis at 95% confidence level.

Measuring Expected Returns (ER)

We regress the model on different stocks for the estimation period. Then, expected returns in the event period (-20,20) are calculated by using the regression formula -

$$ER_{k,t} = \alpha_k + \beta_k R_{m,t} + \varepsilon_{k,t}$$

Where,

$$ER_{k,t}, R_{m,t} = \ln \left(\frac{\text{price}_t}{\text{price}_{t-1}} \right) \times 100$$

Where,

$ER_{k,t}$ = Expected returns of the stock 'k' on day 't'

$R_{k,t}$ = Actual return of the stock 'k' given day 't'

$R_{m,t}$ = Price of index, BSE SENSEX given day 't'

$\varepsilon_{k,t}$ = Random error in the model

α_k and β_k are the unknown parameters of the regression to be calculated using the estimation period. α_k is the intercept and β_k is the slope measures the relation of returns of k stocks with benchmark index $R_{m,t}$

Measuring Abnormal Returns (AR)

The next step is calculating Abnormal returns (AR) during the event period (-20,20) using the formula -

$$AR_{k,t} = R_{k,t} - ER_{k,t}$$

Where,

$AR_{k,t}$ = Abnormal returns of stock 'k' given day 't'

$R_{k,t}$ = Actual return of the stock 'k' given day 't'

Table 8, shows the AR of all the stocks in BS Hotel index for the given time period (-20,20) days.

We can observe from the Table 8 that the abnormal returns of all the companies are decreasing and turning from positive to negative after the event i.e. 30th January, when the first covid case was confirmed in India.

Table 8 : Abnormal returns of hotel stocks in the event period (-20,20)

DAY	Lemon Tree	Chalet Hotels	EIH Hotels	Oriental Hotels	Indian Hotels	Royal Orchid	TAJ GVK
-20	-0.63162	-1.66423	0.263966	0.03272438	0.840737	0.57328	-0.27603
-19	-1.63875	-1.02852	-0.71259	4.45095187	0.121891	-3.41219	0.892608
-18	-1.70881	-1.13026	0.53459	0.30334805	-1.22494	-0.21876	0.878701
-17	-1.30447	-3.67285	-0.43566	-0.1898486	-0.57086	1.081374	1.430956
-16	-1.48844	2.512305	-0.70377	-1.9568395	-0.80775	-1.54505	-0.78357
-15	-0.7797	-1.1803	4.11247	0.83163151	-1.34137	1.599185	0.568877
-14	-0.79644	3.51913	-1.01566	-0.1670745	-1.44327	3.460848	-0.26335
-13	-1.63576	-1.85215	-0.85897	2.72469622	-0.81863	1.720601	7.802203
-12	-2.90755	0.656213	1.278662	-2.5437293	1.265155	3.655334	-2.36137
-11	0.178649	2.480016	1.525553	4.86060985	-1.35505	-2.07081	1.187793
-10	1.319408	-2.2693	-1.37934	2.85779042	2.498708	1.421198	0.623714
-9	-0.36321	2.068326	0.539556	-2.4404854	2.839117	2.655549	-1.04759
-8	-0.927	0.901329	0.070087	-3.6216838	-0.11738	3.670531	-1.21829
-7	-2.13199	1.838606	1.201436	0.30788822	1.245062	3.324912	0.993827
-6	-2.19566	-2.25816	1.34082	0.75958241	0.769855	-4.30172	6.951649
-5	-4.24972	-1.52887	-0.91233	1.04337815	-1.05874	-1.7931	-1.24528
-4	3.722679	-0.6577	-0.55407	-3.1254066	0.282094	-3.14972	1.593164
-3	2.090666	0.381166	1.958203	-2.740794	0.319947	-1.73953	-1.9813
-2	1.247498	-1.65212	-0.42479	-0.4201449	-1.82303	-1.15506	2.447502
-1	2.756381	-0.5032	-0.63742	-1.3508369	-0.56971	-2.08159	0.126034
0	0.968314	-0.72883	-2.26873	-1.9377617	1.452909	-1.22949	-2.19751
1	-0.04101	0.430384	-0.8518	0.54647702	1.504244	-1.10763	-2.93674
2	-0.00862	-2.98582	-1.54419	-1.5558746	0.531555	4.462278	-2.86726

To understand the data better, we also derive Cumulative Abnormal Returns (CAR) for the entire hotel industry by taking the average of the CARs on individual companies.

As already discussed, CAR turning negative from positive over time and gradually increasing implies that the test sector underachieved and produced notably different outcomes. The outbreak of COVID-19 trashed various industries of the Indian economy including the aviation, hotel and tourism industries. The hotel industry, in particular, was severely hurt due to the outbreak of COVID-19. (Table 9)

We have also conducted the study in the period (0,40) so that we can find out if the hotel industry recovered after the event period. Here are the results in tabular form :

Time Period	(-20,0)	(0,20)	(0,40)
CAR of sector	0.77	-5.75	-33.04

The test sector provided positive abnormal returns before the outbreak.

As there were large number of coronavirus cases in other parts of the world but since no confirmed case was reported in India during this event window, so the market was reacting positively.

However, abnormal returns intensified in the (0,20) period. As the period increased further, we can see a huge difference in the Abnormal returns. The same can be studied in the graph below.

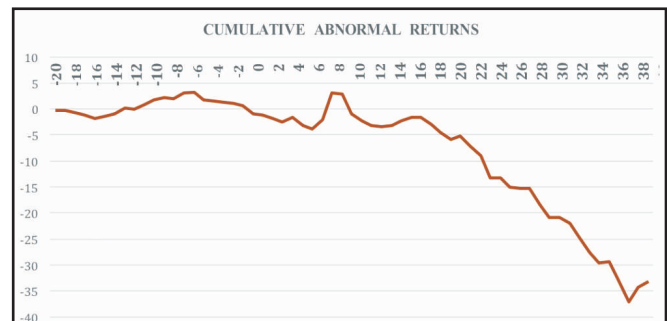


Figure 6 : Plotting of CARs on the line chart

Table 9 : Cumulative Abnormal returns of the Hotel Sector

DAY	CAR	DAY	CAR	DAY	CAR
-20	-0.12302	0	-0.84873	21	-5.15483
-19	-0.31254	1	-1.1996	22	-7.05494
-18	-0.67913	2	-1.76644	23	-8.90686
-17	-1.20218	3	-2.36851	24	-13.0969
-16	-1.88406	4	-1.63883	25	-13.2531
-15	-1.33966	5	-3.09079	26	-15.0659
-14	-0.86906	6	-3.77041	27	-15.225
-13	0.142649	7	-2.05645	28	-15.256
-12	0.005895	8	3.249331	29	-18.3684
-11	0.978288	9	2.877777	30	-20.8616
-10	1.702885	10	-0.85628	31	-20.7603
-9	2.310208	11	-2.23424	32	-21.9364
-8	2.132722	12	-3.11926	33	-24.5583
-7	3.101256	13	-3.45923	34	-27.6033
-6	3.253594	14	-3.15153	35	-29.6176
-5	1.861499	15	-2.21733	36	-29.315
-4	1.591648	16	-1.45482	37	-32.8058
-3	1.347128	17	-1.63249	38	-37.0512
-2	1.092821	18	-2.81142	39	-34.1929
-1	0.769915	19	-4.52686	40	-33.0457
		20	-5.7536		

Hence, we can conclude that COVID-19 had a severe impact on the hotel industry after the outbreak.

Objective 4 – Comparison with BSE Healthcare sector

From Figure 5 and Table 2, we can infer that the only sector that boomed after the outbreak of COVID was the BSE Healthcare sector. While the healthcare sector moved up by 14%, the hotel sector went down by 35%. Hence, these were two of the most affected sectors in the pandemic.

What were the reasons that caused the healthcare sector to move up strongly despite the market falling steeply?

The Covid-19 outbreak has highlighted the importance of the health sector and the need to enhance efforts. The healthcare sector's revenue has reached new heights as the number of patients has increased. Because the COVID-19 disease is a long-term pandemic, investors anticipated high returns. Because of their preventive, curative, rehabilitative, restorative, and health-promoting functions, functional health systems are essential for any individual, community, society, or country, not only for people's physical and mental well-being, but also for gradually raising economic productivity and human development. (Khetrapal, Sonalini; Bhatia, Rajesh (2020). Some of the companies that were the key players in the vaccine, medicines, healthcare services during the pandemic were Cipla, Zydus Lifesciences, Biocon, Glenmark, Dr Reddy Laboratories, and Gland Pharma. These companies were involved in importing as well as manufacturing of vaccines. Therefore, these companies might have a greater positive impact as compared to other health stocks. We further analyse the returns of these companies. Like in previous sections, the data source is the BSE official website.

Similar to the healthcare and pharmaceutical industry, there might be some key players in the hotel industry as well which suffered more than others. A report from Business Standard tells us that an 80 per cent drop (to Rs. 9.5 crore) was observed in the cash profits for the January to March quarter of the nation's largest mid-priced hotel chain, Lemon Tree Hotels (as compared to Rs. 48 crore in Q4 FY19).

Furthermore, with more than 50 per cent share of foreign guests, the most impact will be faced by EIH and Chalet Hotels. The foreign nationals add up to 40 per cent and 10 percent of customer mix for Indian Hotels and Lemon Tree respectively. As per majority of brokerages, foreign customer are more likely to take a longer period to recover than domestic travelers. This is an indication towards a big hit on the occupancies and profitability for

Table 10 : Data for Individual Companies

Company Name	% Change in Stock Prices after the Outbreak	Correlation**	Beta Index**
Dr Reddy's Laboratories	35.96 ¹	0.99	1.25
Biocon	25.42	0.92	1.64
Zydus Lifesciences	29.73	0.98	0.83
Cipla	46.02	0.99	1.07
Lemon Tree	-65.62	-0.94	-0.82
Chalet Hotels	-54.57	-0.83	-0.33
Indian Hotels	-40.23	0.92	0.44

**The covid time period for calculating correlation coefficients and beta index is 25 March 2020 -30 April 2020.

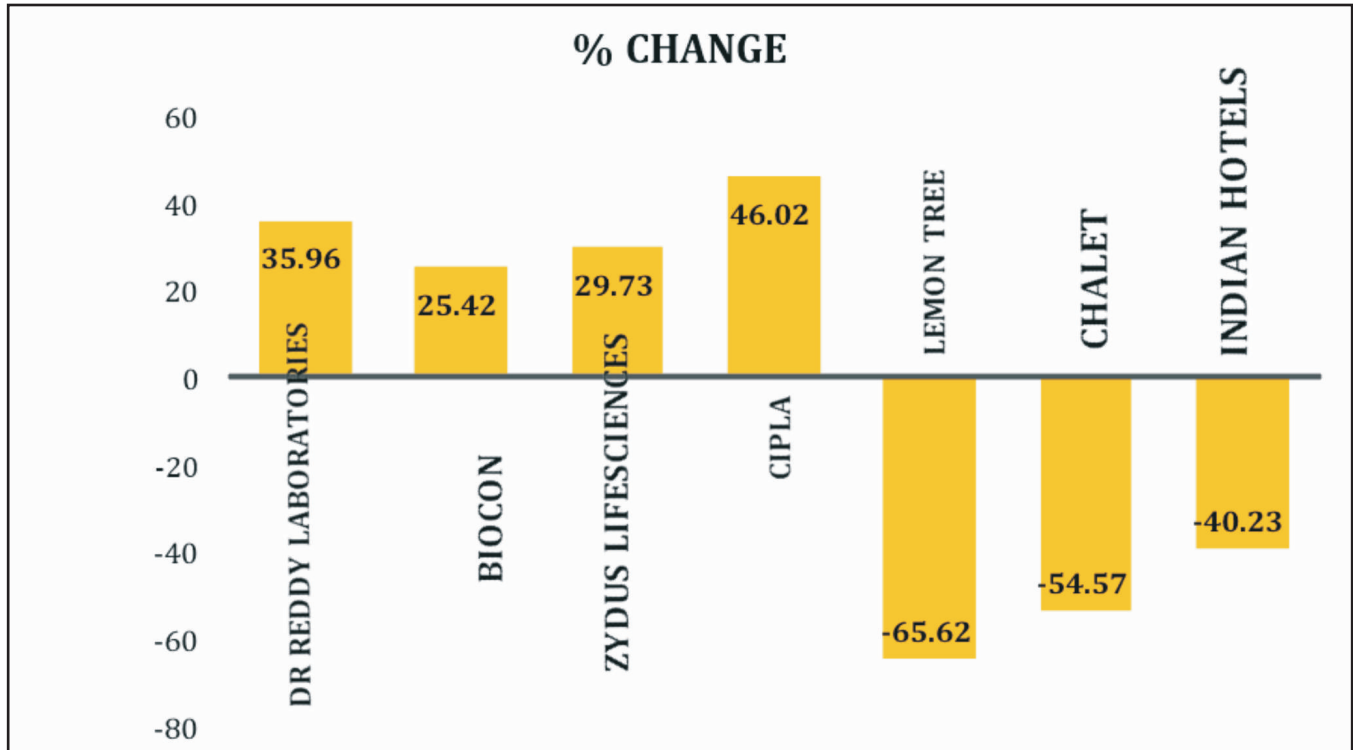


Figure 7 : % Change in stock prices of the given companies during the pandemic

the companies that depend more on foreign customers. (Source : Business Standard)

We investigated these companies with this objective and find out whether they outperformed/underperformed the index. We calculated correlation and beta index (Table 10) for a better understanding of the direction of both the sectors in comparison to the Healthcare sector.

All the companies listed had a significant impact as shown in the table and graph. The correlation coefficients are closer to 1 and -1 for the healthcare and hotel companies respectively, which demonstrates effective evidence for the study. Dr Reddy Laboratories, Biocon, Zydus, and Cipla show a strong positive correlation whereas Lemon Tree and Chalet show a strong negative correlation. This means that when the healthcare sector moved up, the hotel firms moved significantly down in the same period.

The Beta coefficient - The beta coefficient shows an effect on the individual stock when the overall stock market rises or falls. Simply put, a beta index can compare the volatility of a stock compared to the entire market. It is calculated as follows:

$$\beta = \text{covariance} (r_i, r_{bm}) / \text{variance} (r_{bm})$$

Where,

r_i = return of stock 'i'

r_{bm} = return of the benchmark index (i.e. BSE Healthcare)

The movement of two stocks together is measured by covariance. A positive covariance indicates that the

stocks' prices tend to move in lockstep when they rise or fall. The opposite direction of the stocks' movements is indicated by a negative covariance. Variance, on the other hand, denotes how far a stock deviates from its mean. The beta index value of the benchmark index is taken as one. Any beta value greater than that of the benchmark index (1) indicates that the security price of a company is more volatile than the market itself. Biocon has a high Beta index of 1.6, indicating that it will tend to amplify positive market movements. High beta value of a company may result in a higher return over a given time period, however it also comes with a higher risk due to increased volatility.

Other stocks also have a high beta value, which implies that they were highly active stocks traded on the exchange during the time period, further signifying high short-term returns.

A negative beta, as derived from the hotel companies, Lemon tree and chalet, shows an inverse relationship with the BSE Healthcare index (negative covariance) with high volatility and risk.

6. Discussion

We have done a comprehensive analysis at various levels to gain the scenario of the hotel sector vis-a-vis other sectors during the covid period. Hence, we summarise all the observations one by one. In **part 1**, We inferred that there was a high variation in the stock prices of the Indian Hotel sector from the pre covid, to the post covid period. It went down by an average of 37% after the covid occurred in India. This may also be an effect of the halt in operations and high losses.

However, we can also see a post-covid recovery. Further, the ANOVA test confirmed the influence of COVID on the stock prices of different sectors.

In **part 2**, we compared the situation with different sectors and observed all the other sectors also faced the challenges, except the healthcare sector. It should also be noted that the hotel sector changed the most. **Part 3** accrues to the Event study methodology, which is an important statistical study to analyse an impact of a news/event on the stock prices of a company. The results show that BS Hotel Index has given negative returns in covid (Day 16) and the returns amplified with passing time. After interpreting all the results and confirming the downfall of hotel stocks, we found one sector that concurred to positive returns in the covid time. The BSE Healthcare index rose by a whopping 14% even during those testing times. In addition, independent companies are analysed and the causes for the same are determined.

7. Conclusion

We have seen in this paper how a deadly event, such as the pandemic, can severely harm the stock market and, in particular, the hotel industry. Lack of domestic and international tourists, public fear, nationwide lockdown, negative sentiments, inflated losses, and other factors may discourage investors from investing in this sector. The findings show that the pandemic had an adverse impact on hotel stock prices, and that stocks would react similarly in the future. Medical and pharmaceutical industries, on the other hand, were in high demand for delivering the necessary drugs and equipment. They also invested in R&D and produced vaccines, resulting in sector development.

The Healthcare sector promises to grow at a significant pace in the near future (Mittal & Sharma, 2021)

The study provides insights to stakeholders on how stock prices react to a dreadful event like the COVID. The robust recovery of the industry also signifies that the impact of such an event is temporary on the stock prices. The senior management personnel should work towards sustaining the confidence of different stakeholders, and investors by lowering their uncertainty toward the stock market so that, irrational market reactions may not be as severe. (Singh et al., 2020). The Indian government should also implement proper restriction and containment measures to decrease the uncertainty and panic caused by the pandemic, thereby stabilising financial markets.

Our study was limited to a few companies listed on the Bombay Stock Exchange. However, the hospitality sector includes a lot of companies which are not listed on exchanges but contribute majorly to the sector. In addition, no primary data is used and our research is solely based on the data available on websites and e-databases.

The research paper encompasses the covid impact on the stock returns of the hospitality sector but some questions

remain unanswered with respect to the impact on tourism-related industries.

This implies some missed opportunities and can be further explored by researchers.

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Appendix A

All the data related to the stock prices has been derived from BSE's official website. - <https://www.bseindia.com/markets/equity/EQReports/StockPrcHistori.html?flag=0>

The companies' profits and losses as specified in objective 1 has been collected from the official websites :

- Lemon tree Hotels - <https://www.lemontreehotels.com/investors.aspx> Chalet Hotels - <https://www.chalet-hotels.com/financials/>
- EIH Hotels - <https://www.eihltd.com/investors/quarterly-results/> Indian Hotels - <https://www.ihcltata.com/investors/>
- Oriental Hotels - <http://orientalhotels.co.in/investors/financial-results/quarterly/> Royal Orchid Hotels - <https://www.royalorchidhotels.com/investors>
- Taj GVK - <http://www.tajgvk.in/Financial-Results.html>

Appendix B

The raw data and results that were calculated by the Author in Excel :

- Objectives - <https://1drv.ms/x/s!Akzx-z62Z90yg1WrCwGHlty2CgkV>
- Abnormal Returns and regression - <https://1drv.ms/x/s!Akzx-z62Z90yg1EQ2uWnJ5Q9xnTI>
- ANOVA Test - <https://1drv.ms/x/s!Akzx-z62Z90yg1Pfc6iy3w0ly2-y>

