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Lockdown vs. Opening-Up of the Economy During the COVID-19 Pandemic and the Indian Stock Market

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This paper examined the impact of the lockdown and opening-up of India during the COVID-19 pandemic on eleven Indian stock market indices. Using an event study methodology, we found that the lockdown has adversely affected financial services and consumer durables. We show the pharmaceutical sectors exploited the pandemic-induced panic and created artificial demand for medicine. Therefore, policy makers need to be vigilant regarding prices of pharmaceutical products during the pandemic.

I. Introduction

The COVID-19 pandemic affected all sectors of the Indian economy—several studies claimed an adverse impact (Dev & Sengupta, 2020). Some studies have examined the effect of the pandemic on the performance of financial (or stock) markets and found contrasting evidence. Icher and Marinc (2018) found that Ebola severely affected financial markets across regions. Similarly, Sha and Sharma (2020) and Narayan (2020) found that the pandemic has not only increased global financial risks but has also negatively affected stock and oil prices. Another study by Seungho et al. (2020) found both negative and positive impacts of the COVID-19 pandemic on stock market performance. Harjoto et al. (2020) found that the pandemic caused a negative shock to the global stock markets, especially in emerging markets and for small firms, whereas Baker et al. (2020) found that restrictions on commercial activity and the provision of social distancing due to lockdowns affected the service sector. Basuony et al. (2021) found that the impact of COVID-19 was not symmetric across markets. Ozkan (2021) investigated the impact of the COVID-19 pandemic on stock market efficiency for six hard-hit developed countries from 29 January 2019 to 25 January 2021 using the wild bootstrap automatic variance ratio test. He found that all markets deviated from the market efficiency hypothesis during some periods of the pandemic, but the US and UK stock markets deviated the most as compared with other stock markets.

Similarly, a few empirical studies examined the effects of the COVID-19 pandemic on different sectors in India. For instance, Mishra et al. (2020) examined the impact of COVID-19 on the Indian financial market by employing the Markov-switching vector autoregressive model and observed a negative effect. Akram and Rath (2020) also investigated the causal relationship between COVID-19 and price discovery of the Indian electricity market. They found that the pandemic caused spot price discovery of the electricity market. Similarly, Behera and Rath (2021) examined the impact of the COVID-19 pandemic on Indian pharmaceutical companies using the event study methodology. They found that the average returns of the pharmaceutical sector were positive during the COVID-19 phase, but at the firm level the evidence was mixed evidence.

Although we found a few empirical studies on the effect of COVID-19 on financial and energy markets, and at the firm and industry levels for different countries, there was hardly any study looking at the impact of the lockdown and opening-up of India on the country's stock market. In addition, we did not find any study, which examined the impact of COVID-19 pandemic on different sectors as well as the pharmaceutical industry in India. This study is different from the earlier studies because it focuses on India, the second most COVID-19 affected country in the world with the demand for virus-related drugs and medicines spiraling out of control. Thus, it is important to study the effects of lockdown and opening-up of India during COVID-19 on the share prices of pharmaceutical industries, given how essential these industries are to the country. In addition, the study has also tried to find the severity of the effect of the COVID-19 pandemic on different sectors' stock returns.

The rest of the paper is organized as follows. Section II discusses the data and methodology. Section III discusses the main findings. Section IV provides concluding remarks.

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II. Data and Methodology

A. Data

This study used secondary time-series data of eleven Indian sectors to examine the effects of the lockdown and opening-up of India during the COVID-19 pandemic on the sectors' cumulative abnormal returns. The selected sectors are the automobiles, banking, consumer durables, financial services, information technology (IT), media, metal, oil and gas, pharmaceuticals, reality, and fast-moving consumer goods (FMCG). These sectors were selected based on their market share in the CNX Nifty index. We used the closing prices of these selected sectors' indices. Our data is sourced from the National Stock Exchange website (www.nseindia.com) over the period from 03 December 2019 to 21 January 2021, which was purely based on availability of data. We considered 25 March 2020 and 01 June 2020 as event days in India as lockdown and opening-up occurred on these dates, respectively. Further, we considered 30 pre- and post-event days for the analysis (Kritzman, 1994).

The study used an event study approach and the buy and hold abnormal return (BHAR) approach to understand the impact of the lockdown and opening-up of India during the COVID-19 pandemic on the country's stock market.

B. Event Study

The event study approach was first developed by Dolley (1933), and then it was subsequently extended by MacKinlay (1997). We used the following regression:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it} \tag{1}$$

where R_{it} represents share returns of sector i in period t and R_{mt} refers to market return in period t. The variable ε_{it} is error term, whereas α and β are the parameters to be estimated. Once we obtain the regression results, we calculate abnormal returns (*AR*) and cumulative abnormal returns (*CAR*) as follows:

$$AR_{it} = R_{it} - ER_{it} \text{ and } CAR_i = \sum_{t=E2}^{E3} AR_{it} \tag{2}$$

In Equation (2), ER_{it} refers to expected returns/normal returns of sector i in period t.

C. Buy and Hold Abnormal Returns

We used buy-and-hold abnormal returns (*BHAR*) for the robustness test. The *BHAR* for a stock i over an interval trading day between T_1 and T_2 is calculated as in Equation (3).

$$BHAR_{i,\,T_2 T_2} = \left[\prod_{t=T_1}^{T_2} (1 + R_{it}) - \prod_{t=T_1}^{T_2} (1 + R_{mt}) \right] \tag{3}$$

where $BHAR_{i,\,T_2 T_2}$ is the *BHAR* for firm i over an interval of trading days between T_1 and T_2. The variable R_{it} denotes the actual returns for different companies at time t and R_{mt} denotes the actual market returns at time t (Narayan et al., 2017).

III. Results

The CAR results for the eleven different sectors are reported in Table 1. It is seen that neither the automobile sector nor the banking sector suffered significantly during both the lockdown and opening-up period in India, whereas the consumer durables sector got significantly affected by both events. This appears to be consistent with the spending hypothesis, which states that, during periods of economic uncertainty, people lose confidence in the economy, and this mostly affects consumer durable goods. Furthermore, financial services were negatively affected by the lockdown, whereas metals were positively affected by the opening of the economy. The pharmaceuticals sector recorded positive returns both during the lockdown and the opening-up periods of the economy because the media created panic among people, which then created artificial demand for medicine during the pandemic. In turn, this created a positive spillover impact on pharmaceutical stock prices. However, the realty sector showed negative returns during the lockdown period as it is a labor-intensive sector. Finally, when we considered the average of all sectors and found that the cumulative return series were not statistically significant.

To check the robustness of the estimated results, we applied *BHAR* techniques. The corresponding results are reported in Table 2. These *BHAR* results confirmed the consistency of our findings.

IV. Conclusion

This study investigated the impact of the lockdown and opening-up periods of the COVID-19 pandemic on eleven sectoral indices of CNX Nifty index in India. We applied the event study methodology to analyze the impact of the lockdown and opening-up periods on cumulative abnormal returns. We found that the COVID-19 pandemic has negatively affected sectors like consumer durables, financial services, realty, and IT. The automobile and banking sectors were not significantly impacted by these events. The metal sector was positively affected by the opening-up of the economy. The pharmaceuticals sector recorded positive returns both during the lockdown and opening-up periods of the economy because the media created panic among people, which then created artificial demand for medicine during the pandemic. (Behera & Rath, 2021). In turn, this created a positive spillover impact on pharmaceutical stock prices. Since all sectors were affected by COVID-19, there is a need for the government and policy makers to immediately intervene. The policy makers need to provide necessary subsidies to the sectors that were negatively affected by the pandemic. Since some sectors, particularly, the pharmaceutical sector, took advantage of the pandemic, policy makers need to be vigilant regarding prices of pharmaceutical products as there is a high probability of artificial price hikes.

Table 1. Cumulative Abnormal Return

Company Name	Pre-Event (30 days)		Post-Event (30 days)		Window Period (61 days)	
	Lockdown	Unlock	Lockdown	Unlock	Lockdown	Unlock
Auto	0.09	0.05	-0.00	-0.03	0.04	0.01
Bank	0.01	-0.08	-0.10	-0.02	-0.10	-0.11
Consumer Durables	-22.06*	-22.08*	-22.21*	-22.16*	-45.09*	-45.01*
Financial Services	0.00	-0.06	-0.11***	0.01	-0.01	-0.09
IT	-0.24*	0.08	0.00	0.18	-0.13**	0.17
Media	-0.12	0.05	-0.02	0.06	-0.13	-0.11
Metal	0.02	-0.04	-0.05	-0.07	-0.08	3.38**
Oil & Gas	-0.09	0.04	0.08	-0.35	-0.06	0.00
Pharma	0.02	0.04	0.24*	-0.01	0.24*	0.01
Reality	-0.12	-0.10	-0.14***	-0.04	-0.31*	-0.14
FMCG	0.08	-0.06	0.00	-0.10	0.05	-0.08
Average	-0.34	-0.10	-0.09	-0.22	-0.81	-0.35

This table reports cumulative abnormal return of eleven sectors. *, ** and ** denote statistical significance at the 1%, 5% and 10% levels, respectively.

Table 2. Buy and Hold Abnormal Return (BHAR)

Company Name	Pre-Event (30 days)		Post-Event (30 days)		Window Period (61 days)	
	Lockdown	Unlock	Lockdown	Unlock	Lockdown	Unlock
Auto	-0.84	0.69	0.06	0.24	0.60	0.55
Bank	-1.49	-0.08	-1.18	-0.02	-1.60	-0.11
Consumer Durables	-12.03*	-11.28*	-15.11*	-18.21*	-22.06*	-24.05*
Financial Services	0.01	-0.03	-0.22***	0.04	-0.03	-0.12
IT	-0.28*	0.18	0.00	0.18	-0.19**	0.11
Media	-0.21	0.08	-0.05	0.08	-0.23	-0.18
Metal	0.07	-0.09	-0.03	-0.05	-0.11	2.45**
Oil & Gas	-0.09	0.04	0.08	-0.35	-0.06	0.00
Pharma	0.05	0.06	0.35*	-0.03	0.14*	0.02
Reality	-0.13	-0.11	-0.19***	-0.03	-0.21*	-0.15
FMCG	0.09	-0.03	0.01	-0.14	0.07	-0.06
Average	-0.31	-0.13	-0.08	-0.12	-0.61	-0.21

This table reports *BHAR* of eleven sectors. *, ** and ** denote statistical significance at the 1%, 5% and 10% levels, respectively.

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