The Indian Stock Market Reactions to COVID-19

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Introduction

In this paper, we are trying to analyze the market reactions to the 2019-novel CoronaVirus disease (COVID-19) and how the increases in confirmed cases, due to coronavirus are associated with a significant increase in market illiquidity and volatility. The first confirmed case was reported in India on January 30th, 2020 and by March 15th we had 100 cases in the country. According to the World Health Organization (WHO), by 10 March 2020, COVID-19 had led to more than 110,000 confirmed infections and 4,015 deaths in 110 countries, and the numbers were increasing rapidly. The first nationwide lockdown was announced (from March 25 to April 14) and this was a huge disruption to daily everyday life. Beyond the immediate tragedies of death and disease, indirect effects through fear were taking hold of an uncountable number of people around the world. In light of the massive impacts of the coronavirus on public physical and psychological health, the economic and financial impacts may seem secondary. However, the economic effects are potentially going to be of first-order importance.

An effective way of understanding the consequences of events like the emergence of COVID-19 is to consider asset price changes. These price changes capture current expectations. Effectively, asset markets provide ongoing,high-stakes surveys regarding future expected outcomes.

We investigated three periods- Period 1(30 January 2020 to 29 February 2020), Period 2(1 March 2020 till 1 April 2020), and Period 3(2 April till 17 June), and in the table below the cumulative returns from the NIFTY index is given for the entire duration of the specified periods.

	Cumulative Returns
Period 1	-0.077
Period 2	-0.263
Period 3	0.153

We can clearly observe that the maximum loss happened in the second period (in the month of March) with a negative cumulative return of -26.3%.

We further computed the drawdown for the entire period from 1 January 2020 till 17 June 2020 and found that the maximum drawdown was -38.44%, observed on 23 March 2020. This was the very next trading day after the one day Janata curfew on 22 March.

One thing was clear that there was no observable correlation between the number of confirmed coronavirus cases and the nifty prices/returns. However, analyzing the google search trend results in India (on COVID19) gives an important takeaway that it was the public sentiment that had the most impact on the market prices and volatility. The market sentiment in response to the outbreak can be quickly amplified through social media which then stimulate trade activities and cause extreme price movements. The stock market basically provided us a view of what the investors expected for the future. Through a mix of fundamental value-drivers and simple demand and supply dynamics, asset prices emerge.

Figure 1: NIFTY Adj Close from 1 Jan 2020 till 17 June 2020

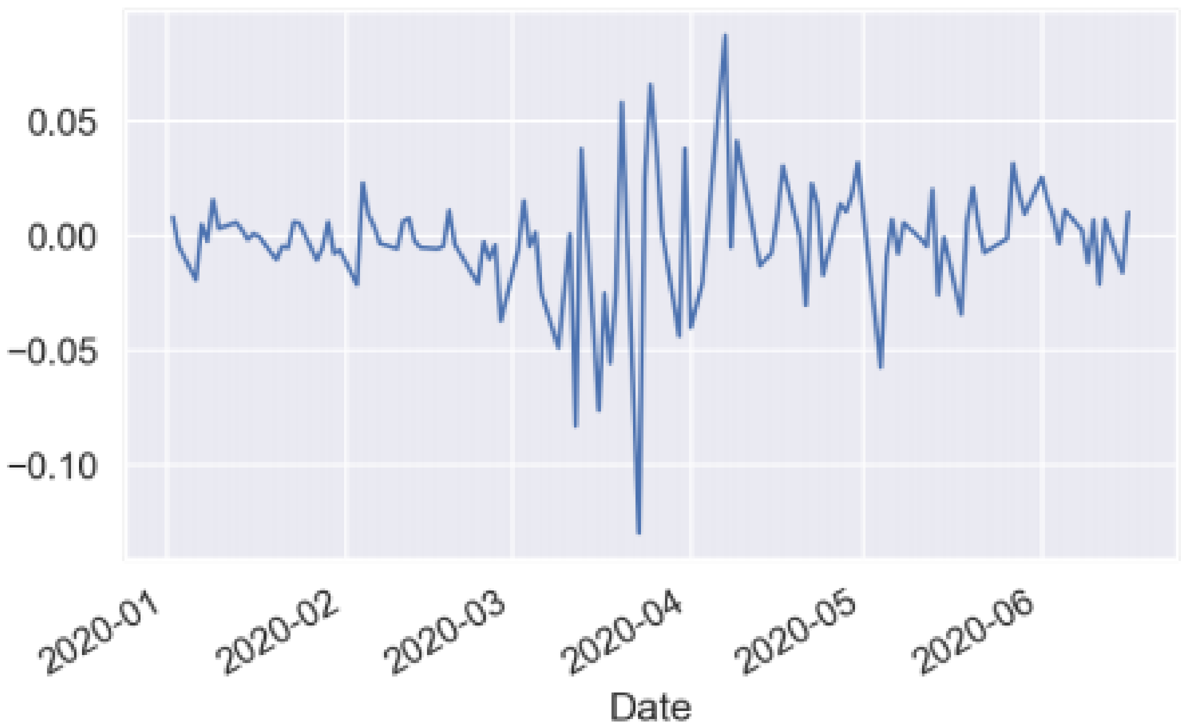

Figure 2: NIFTY Returns from 1 Jan 2020 till 17 June 2020

The Google search intensity on coronavirus in India increased massively in March which peaked around the last week of March (23-24 March 2020). It subsided somewhat after its interim peak at the beginning of April. During this period(March-April) the google search intensity factor can be seen to be highly negatively correlated to the NIFTY index with a correlation of -0.685. Also, the overall correlation from 1 March 2020 till 15 June 2020 (latest data available) is -0.52. From this, we can see that search query data is relevant to analyzing the public sentiment regarding the pandemic and hence its effect on financial markets.

Another important, although expected correlation we can find is between the Dow Jones Industrial average and NIFTY. During the period from 1 Jan 2020 till 17 June, there seems to be a very high correlation of 0.93 between the two market indices. Substantial increases in volatility were observed due to the pandemic outbreak.

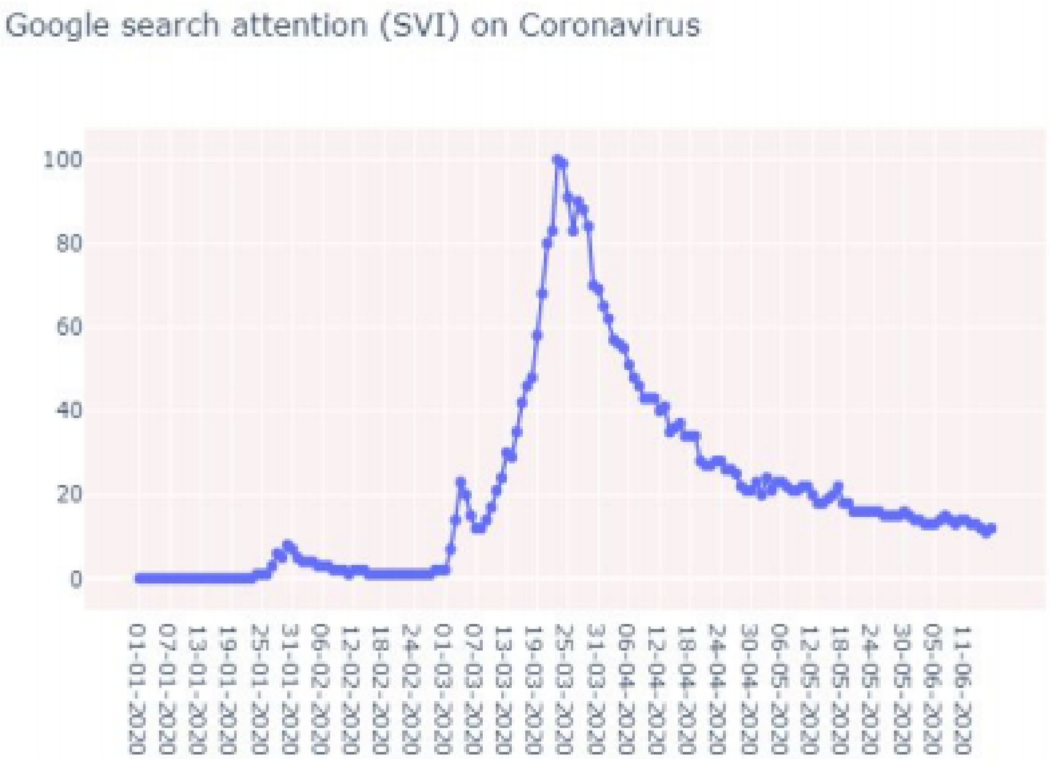

Figure 3: Google search trend results of the term covid-19

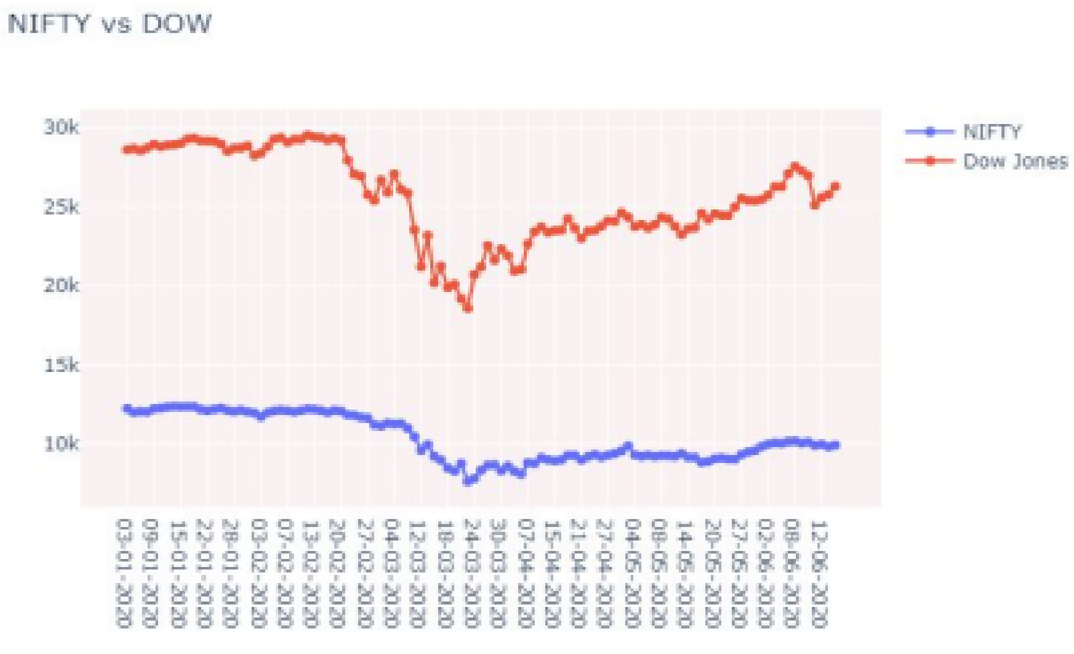

Figure 4: Comparison of NIFTY prices vs DJIA

Stock Returns By Industry(India)

We begin our analysis with an overview of industry-level returns in India throughout the period from 1 January 202 till 1 June 2020. While discussions in the media have generally used raw returns, we also compute CAPM-adjusted returns, that is, returns adjusted for a firm's exposure to the overall market. We can observe here that the only industry with a positive cumulative return in this period is the Pharmaceutical industry. The Nifty Pharma index had a return of 22.6% in April 2020, while the broader Nifty50 is up only by 6%. Due to the sector's relative resilience to Covid-19 disruption, a positive stance can be observed on Indian Pharmaceutical Stocks.

From the below chart we can clearly see that Banking Sector, Financial Services, Realty, Retail, and Automobiles are at the front among the sectors that are smarting under severe pain now. Organized retailers are heavily impacted by the shutdown of malls and shops whereas the influence on essential goods retailers is minimum. This situation is likely to improve steadily post-recession, as employment and personal income in the economy reverse. While the demand for food and retail grocery could go back to normalcy as and when the lockdown is lifted, the demand for discretionary items will take time to revive and to that extent, other retailers might see the impact for a longer period.

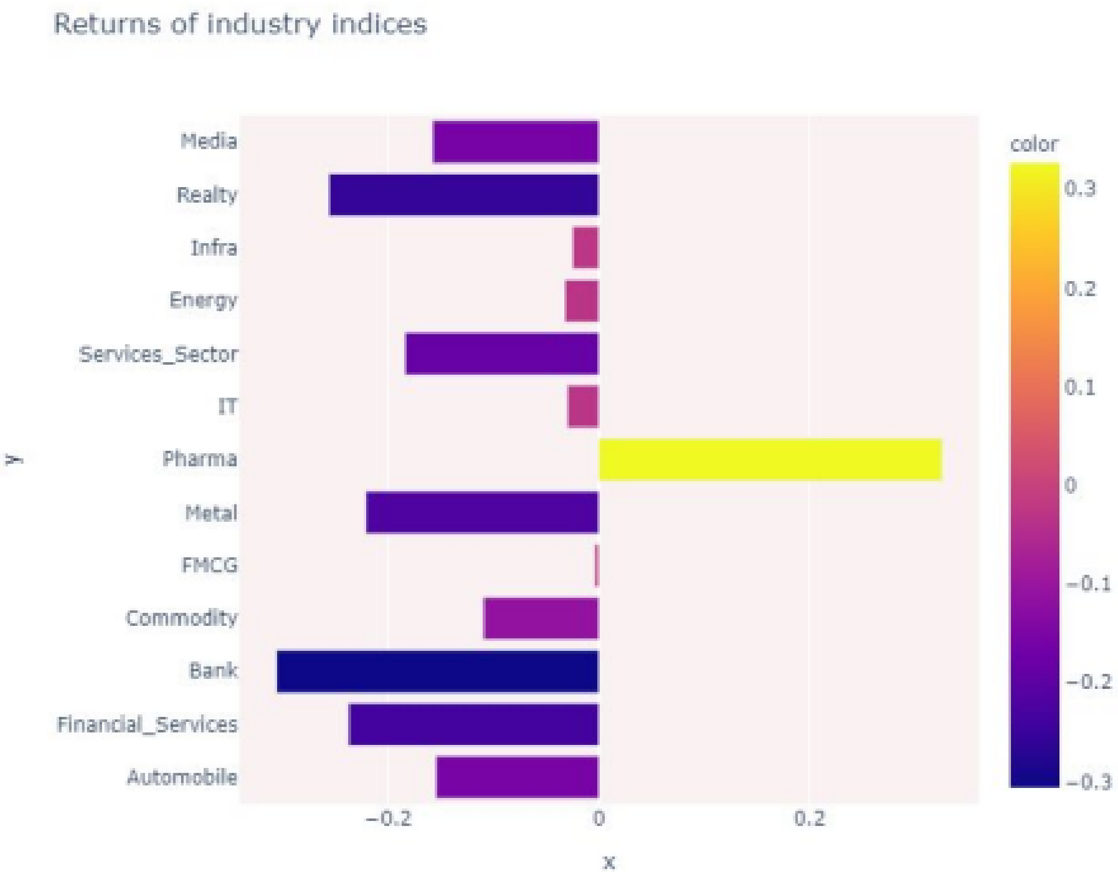

Figure 5: Cumulative returns of various industry indices over the period 1 Jan till 17 June 2020

Several small and medium scale industries are on the cusp of collapsing and hence there is the fear that banks and NBFCs may see a rise in NPAs. Also with the COVID-19 pandemic leading to lower GDP growth for FY2021, the risk of a precipitous fall in loan growth is getting stronger. New constructions are stopped and sales in the realty sector have taken a hit. The sales are expected to take further hits in the near-term. The recovery path for the real estate sector seems to be slow and painful. The Automobile sector had been trying to overcome myriad challenges already, and the outbreak of COVID-19 is no less than a curse. In FY20, automobile volumes declined on account of weak economic scenario, price increase due to BSVI transition, inventory correction by OEM's, and Covid-19 impact from March 2020.

The basic financial conditions(leverage, cash holdings, and profitability), International Supply Chain, Corporate investment in CSR, and Ownership structure are some of the factors playing a major role in the amount of volatility and stock price shocks experienced by a firm.

The pre-pandemic financial conditions of companies have shaped the reaction of their stock prices w.r.t COVID-19. The firms with more cash, larger profits, and fewer debts have a better stock price value compared to other firms. With the passing of the pandemic, corporate sales and firms tried to liquefy their assets, and stock markets considered the leverages, cash reserves, and profitability while calculating the value of the firms. On an empirical level, a low cash firm would experience a lower drop in stock returns than a firm with a higher-leverage.

The stock price decline has been higher in firms with their chains extending to multiple pandemic-hit countries since it affects more of their international supply networks and not just the local supplies. The effect can be sub-divided into two groups:

● Supplier's Exposure - The weighted average of firms' pre-pandemic supplies from the supplier countries

● Customer's Exposure - The weighted average of firms' pre-pandemic customer demand to the countries where the product is sold.

Corporate Social Responsibility is an important factor for the survival of large firms. A company with better CSR investments enjoyed better stock prices in these dire times. These investments develop trust in both stakeholders and customers as everyone is now ready to adjust to the changes initiated by the executive board for the smooth functioning of the company.

Markets penalized firms with more entrenched executives. Firms were compared on the basis of antitakeover provisions, thus concluding that executive entrenchment acted as a negative factor against immunity towards the pandemic. Thus, firms open to mergers, acquisitions, and flexibility in their policies seemed to be having a good time maintaining the stock prices at decent values.

We can find a strong link between the ownership structure and the stock price reactions to COVID-19. Focus is more on the stockholders having shares of more than 5% of the company. If the owners believe in long-range investments in the company, rather than hedge fund ownerships which are for short periods, the company is seen to perform better in the current scenario, i.e., less fall of stock prices.

Concluding Remarks

Through this study, we tried to understand how the market is adjusting to the rapid emergence of this worldwide pandemic and the risk associated with it. The results suggest that the market fairly quickly began to respond to concerns about the possible economic consequences of the novel coronavirus. We observed large price moves in the month of March when investors started to become concerned about the potential amplification of the COVID-19 shock through financial channels. The stock price captured the expectations of market participants regarding future economic consequences. Our findings show that there is a causal positive direct relationship between Google trend metrics for COVID-19 and market volatility. Also, increased anxiety produced by the increased search for consequences concerning the pandemic has a negative impact on market returns.

Code/Data Analysis

An online Jupyter Notebook (.ipnyb file) containing the exploratory data analysis and data plots can be found on this link. Python was primarily used for the data analysis in this project.