CHAPTER-16

IMPACT OF COVID -19 ON INDIAN STOCK MARKET

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ABSTRACT

The onset of the COVID-19 pandemic and lockdown announcements by governments have created uncertainty in business operations globally. For the first time, a health shock has impacted the stock markets forcefully. India, one of the major emerging markets, has witnessed a massive fall of around 40% in its major stock indices' value. Therefore, we examined the short-term impact of the pandemic on the Indian stock market's major index (NIFTY50) and its constituent sectors. All the sectors were impacted temporarily, yet the financial sector faced the worst. Sectors like pharma, consumer goods, and IT had positive or limited impacts. We discuss the potential explanations for the same. These results may be useful for investors in safeguarding equity portfolios from unforeseen shocks and making better investment decisions to avoid large, unexpected losses. . This research paper presents the impact of COVID-19 on the India's stock market. There are two major stock exchanges in India i.e. Bombay Stock Exchange (BSE) and National Stock Exchange (NSE).

Keywords: *Covid-19 pandemic stock market volatility, capital market, investors, unexpected losses*

INTRODUCTION

Increasing life expectancy, from 64.2 years in 1990 to 72.6 years in 2019, has increased the importance of the healthcare and pharmaceutical business globally (United Nations,2019). India has the world's third-largest pharmaceutical industry in terms of volume, and its cheap operating costs and high-quality goods across the value chain make it an appealing location for the establishment of generic R&D centres and manufacturing units. India is the world's largest supplier of generic medications, accounting for 20% of worldwide generics exports in volume. India exports to over 200 countries and generated USD 19.14 billion in trade in FY19, with that figure likely to rise to USD 22 billion in FY20. In terms of revenue and employment, healthcare has overtaken education as India's most important industry. A rise in income, higher health awareness, and enhanced access to insurance are expected to bring the total to USD 372 billion by the end of FY22. The government'sspending on healthcare rose to 1.4% of GDP in FY18 from 1.2% in FY14, according to the World Bank Economic Survey FY18. When India's government puts money into and improves these industries, it does so to better the lives of its people and protect them against worldwide pandemics in the future.The second part of this study investigates what role, if any, Federal Reserve actions might have played in these áuctuations. Specially, we use a high-frequency event study to explore the role of central bank communications during March and April of 2020. We And no evidence that conventionalmonetary policy announcements promulgating decisions to lower the target range for the federal funds rate to near zero or to increase the Federal Reserveís holdings of Treasury securities and agency MBS were a contributing factor in the market rebound.

SIGNIFICANCE OF THE STUDY

In today's scenario, both consumers and the companies prefer green products. There is growing interest among the consumers all over the world regarding protection of environment. In certain cases, the more environmental friendly product influencesthe purchase decision of the customers, who look to reduce energy consumption and waste generation."When a movement becomes too popular, it is then the corporate takes notice to implement it.

OBJECTIVES OF THE STUDY

1. To better comprehend Apollo's stock return patterns before and after the -19.
2. To provide Apollo with better stock market performance suggestions.

DATA COLLECTION RESOURCE

The study relies on secondary data from the BSE official website and literature reviews gathered from sources on the internet from before (2017-2019) and after (2019-2021) the study period.

TOOLS AND TECHNIQUES OF THE STUDY

Techniques: Returns = Ending price - starting price * 100/starting price T- Test

Tools: **1.** Tables 2. Graphs

LIMITATIONS OF THE STUDY

1. A secondary set of data was used to construct the study.
2. The study looked at both the pre-event period (2017-2019) and the post-event period (2019-2021), which are referred to as the periods before and after the coved period, respectively.

Problem: The problem was also employees' infections, which made it impossible to conduct business in an undisturbed manner. The pandemic led also to a substantial fall in energy demand and global CO_2 emissions . Where the specific nature of the activity allowed it, the COVID-19 pandemic contributed to a change in the organization and work model of many entities, causing their decentralization, forcing greater flexibility of operation and starting the transformation towards remote work but also influencing internal relations, employee adjustment and human resources management . The issue of respecting human rights in such conditions was also raised. The COVID-19 pandemic is a new phenomenon, therefore the studies on it are still new but quickly expanding.The financial issues during the pandemic have been a subject of investigations so far in scope of insurance , banking or financial system.The influence of the pandemic onto alternative investments such as cryptocurrencies is also becoming important area of the research in finance.The shows a relatively low number of works related to the CEE countries where the pandemic has also been strongly affecting the financial markets.Apart from not many works related to the pandemic in CEE, a largely missing part in the current research is the influence of COVID-19 onto specific sectors of economies.The concept of financial stability is ambiguous and can be interpreted in many ways as well as from different perspectives, including infrastructure, institutions, instruments, markets, regulations and financial results. A growing number of papers linking COVID-19and finance relates to stock markets.Moreover, provided systematic analysis on the dynamics and dimensions of the unprecedented decline in the public transit demand due to the pandemic.The issue of respecting human rights in such conditions was also raised.. It can be treated as a specific demand and supply shock, the source of which is the lockdown of the real economy and disruptions in service, trade and production activities resulting from sanitary and epidemic reasons.In turn, various economic

variables also affect the stock market. Indian capital markets have been receiving global attention and the rapid integration with the world economy has increased India's global competitiveness. The global ratings are awarding India with investment grade ratings, indicating comparatively lower sovereign risks.Apart from not many works related to the pandemic in CEE, a largely missing part in the current research is the influence of COVID-19 onto specific sectors of economies. Some results of sectoral affection can be found in pointing the relatively lowest downgrading of the health care and consumer goods and the highest in energy, financial and industrial sectors.

LITERATURE REVIEW

The review of the literature shows a relatively low number of works related to the CEE countries where the pandemic has also been strongly affecting the financial markets. The reason behind such phenomenon may be the relatively large fragmentation of local capital markets in the CEE region, their small capitalization in most of the countries, as well as the overall lower financialization of the economies compared to highly developed countries. In this scope the investigation of Topcu and Gulal reveals that the negative impact of the pandemic on emerging stock markets was stronger in Asia than in Europe and has gradually fallen and begun to taper off by mid-April. The authors also point that in emerging markets the size of stimulus packages provided by the governments matter in offsetting the effects of the pandemic. Other research related to exchange rates and stock market behavior of the Visegrad countries of CEE during the pandemic shows a significant and negative link between the Visegrad stock market indices and the COVID-19 spread.The literature in this scope contains works published even before the outbreak of the pandemic but suitable for explaining investor behaviors in the COVID period as well as works completed during the pandemic. In the first group, one may find papers addressing the issues of contagion , spillovers between markets during shocks as well as the impact of bad news on the time-varying betas. In the second, there are papers related to issues of dependencies between global factors and markets or to links between individual stock market reactions and severity of the outbreak of pandemic in various countries . Moreover, one can list some other works, e.g. related to pricings of stock during the pandemic.

METHODOLOGY

Clustering is the unsupervised grouping of objects into classes without any *a priori* knowledge of the datasets to be analyzed. The purpose of clustering is to find high-quality groups of similar objects and identify patterns in the data. The problem of clustering is to divide a given data set into clusters (groups) in such a way that data points in a cluster are more similar to each other than points in different clusters. Clustering itself should not be considered as one specific algorithm as it is a general task to be solved. This can be achieved by using different clustering methods, which vary considerably within the meaning of what constitutes a cluster and how to find them.Most of the clustering methods can be categorized as hierarchical or partitional clustering. Algorithms of hierarchical clustering generate a cluster tree (dendrogram) by using heuristic splitting or merging techniques. By contrast, partitional methods usually require that the number of clusters and an initial clustering be specified as an input to the procedure.In our study we apply two clustering methods: the *K*-means and the Ward techniques. The *K*-means method is a well-known partitional clustering algorithm. It determines clusters with minimal variability of the observations within each cluster, calculated using the within-cluster sum of squares:

$\sum_{k=1}^{K}\sum_{i:x_i\in C_k}(\|x_i-\mu_k\|^2)$, where K is the number of clusters, C_k (k = 1,2,…,K) denote clusters, μ_k are centroids (usually described by the mean of points in the cluster C_k). In order to indicate the optimal clustering, the iterative algorithm is performed. It starts with randomly selected (or derived from *a priori* information) initial K centroids. Then each point in the data set is assigned to the closest cluster (i.e. to the closest centroid), based on the distance function. Next, based on the absorbed cases, new centroids are calculated. This process is repeated until convergence is achieved.The second applied technique is the Ward method of hierarchical clustering. Like other agglomerative techniques, it consists in building nested clusters by merging them successively. The result can be represented as a tree (dendrogram) which describes the hierarchy of clusters. The Ward algorithm starts with clustering where each data point forms a cluster by itself. In each step the two clusters that minimally increase within-cluster variance (i.e., the error sums of squares (1) with $\mu_k = \overline{x}_k$) are merged. The algorithm terminates when there is only one cluster left.To assess the results of clustering, the validation measures should be applied. Such measures can be additionally useful to choose the proper clustering method and its parameters, e.g. the assumed number of clusters. $\widetilde{\sigma} = \frac{\sigma_1 - \sigma_0}{\sigma_0}$, where σ_0 and σ_1 are the standard deviations of log-returns of a given index over the base and pandemic periods, respectively. As a result, the value $\widetilde{\sigma}$ is the relative change of the standard deviation.The second stability measure of volatility refers to the Parkinson [93] estimator of the standarddeviation, expressed as: $\sigma_t^{(p)} = \sqrt{[ln(H_t/L_t)]^2/(4\ln 2)}$, where H_t and L_t are the daily high and low prices, respectively. This estimator has an advantage over that based only on the closing prices because it uses information about the price changes during the day. As it can be seen it is calculated separately for each day t. Finally, in our study, we use the measure:

$\widetilde{\sigma}^{(p)} = \frac{\overline{\sigma_1^{(p)}} - \overline{\sigma_0^{(p)}}}{\overline{\sigma_0^{(p)}}}$, where $\overline{\sigma_0^{(p)}}$ and $\overline{\sigma_1^{(p)}}$ are the mean values of the Parkinson estimator over the base and pandemic periods, respectively. The value of $\widetilde{\sigma}^{(p)}$ is the relative change in mean daily variability as measured by the Parkinson estimator.

LIMITATIONS & IMPLICATIONS

Stock prices are more informative when the information has less social value. Speculators with limited resources making costly (private) information production decisions must decide to produce information about some firms and not others. We show that producing and trading on private information is most profitable in the stocks of firms with poor corporate governance -- precisely because it will not be acted upon -- and less profitable at firms with better corporate governance. To the extent that the information in the stock price is used for disciplining the CEO by the board of directors, the informed trader has a reduced incentive to produce the information in the first place. We test our model using the probability of informed trading (PIN) and the probability of forced CEO turnover in a simultaneous-equation system. The empirical results support the model predictions. Stock prices are efficient, but there is a limit to the disciplining role they can fulfill.This evidence is consistent with our model prediction: PIN goes down if there is an exogenous shift in regulatory oversight that reduces managerial entrenchment and strengthens the board's monitoring of firm managers. The channel through which the regulatory change affects informed trading is illustrated in our model, that is, the tension between the board's monitoring effort and the informed trader's information production effort.These parameter estimates once more confirm the prediction of our theoretical model: a CEO is less likely to be removed when he is more entrenched and the board has to bear a higher cost of removing him.Stock prices are more informative when the information has less social value. Speculators with limited

resources making costly (private) information production decisions must decide to produce information about some firms and not others.

CONCLUSION

The COVID-19 pandemic has a significant impact on the socio-economic situation of most countries in the world. It is undoubtedly a turning point in the activities of many sectors, as well as for the directions of development of the entire economies. In some industries it will undoubtedly cause a significant change in the business model or affect a structural change in the income and cost conditions. The consequences of changes and transformations in individual sectors are currently difficult to predict, as it is not known how long the pandemic will ultimately last and what its costs will be.Due to the doubts concerning the turning point to be taken as the beginning of the pandemic and what period length of the pandemic is the most informative, we considered four time ranges. To perform the analysis, we proposed six indicators (diagnostic variables) describing stability in terms of profitability, volume, overbought/oversold conditions and volatility. We conclude that the use of all these variables resulted in a poor clustering results. However, we found that limiting the set of diagnostic variables to three aspects: profitability, volume and volatility leads to much better results. The results show that none of the distinguished clusters, and hence the indices included in the cluster, can be considered as the most or the least stable accordingly to all the investigated variables. The results obtained from our research may bring several significant benefits to individual as well as institutional stock exchange investors. Determining the number clusters and their compositions allows for better understanding of the behavior of industries and their companies in terms of external shocks, and thus for taking investment decisions that optimize the composition of the portfolio of securities. As our research characterizes the proximities in market behavior of multiple sectors, the investors may manage the investment risk in more effective way.As our research characterizes the proximities in market behavior of multiple sectors, the investors may manage the investment risk in more effective way. Moreover, knowing the stability profile of individual sectors (according to profitability, volatility, turnover), investors can develop specific investment strategies within each cluster. Including this knowledge may also support more effective application of derivatives, such as futures or options, to manage investment portfolios. Stock prices are more informative when the information has less social value. Speculators with limited resources making costly (private) information production decisions must decide to produce information about some firms and not others.We conclude that the use of all these variables resulted in a poor clustering results. However, we found that limiting the set of diagnostic variables to three aspects: profitability, volume and volatility leads to much better results.The results show that none of the distinguished clusters, and hence the indices included in the cluster, can be considered as the most or the least stable accordingly to all the investigated variables.

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