COVID-19's Impact on the Stock Markets

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ABSTRACT

In this paper, we analyse and study the impact of novel coronavirus on the stock markets of six different economies of the world, China being the epicentreof the disease and other countries being those that are majorly affected by COVID-19.We look at the difference in the market situation before and after the outbreak of COVID-19 in the chosen countries. The past studies suggest that such pandemic shows a worse effect on the stock market in the short-run but the markets eventually stabilizes in the long run.We have usedstatistical techniques to quantify our results and compare the effect.

For the chosen countries the data has been derived for three different timelines: pre COVID, initial stage, and post COVID. The pandemic has forcefully impacted the stock market.The findings indicate that the lockdown due to the spread of COVID-19 did have a significant impact onthe stock markets. Moreover, a spill-over effect of the outbreak in China could be seen in the other countries and later the indirect effects of the restrictions in the other countries across the world were seen in China.

Keywords: pandemic, China, spill-over, returns, indices

INTRODUCTION

The world was struck by the worst pandemic (COVID-19) in decades caused by a novel coronavirus in late 2019 that has shaken the entire humanity to its core. The first traces of coronavirus in a human was found on 17th November last year in the Hubei Province of Wuhan, China. Being a highly communicable disease, it spread like wildfire across the globe affecting more than 8 million people with more than 350 thousand deaths as on 15h June 2020 as per the data available on www.worldometers.info. The mass movements of the people during the Christmas and New Year led the virus to spread rapidly to other provinces of China. As a precautionary step, the Chinese government suspended all forms of transportation from 23rd January. The World Health Organization issued its first alert on 30th January and declared it a pandemic on 11thMarch.

Since the restrictions levied on 23rd January, various Media outlets across the world have reported how the economies worldwide have been affected by the virus. Reports titled 'Spread and Shutter' in The Economist[1] and 'Sneezy Money'[2] points states that COVID-19 is a major threat to the financial markets and the disturbance being caused to the economy due to the interference with the supply of labour, goods, and services. The World Economic Outlook[3] has predicted the global growth to be -4.9% in 2020.

The financial markets have fallen to significant low-levels in the wake of the spread of the virus with some countries seeing a fall of up to 30%. In the words of the UN Deputy Secretary-General Amina J. Mohammed, "We have moved into a recession that will be worse than the one we experienced in 2008."[4]

This study aims at analysing the impact of COVID-19 on the stock markets of the major

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economies across the globe. It brings forth the changes and deviations caused in the returns of the major indices of these countries. The readers of this research paper will be able to understand if this pandemic had a significant effect on the financial markets of the economies and to what extent and during which stage of the spread of the virus.

REVIEW OF LITERATURE

Scott et al. (2020) did a study to study market volatility, economic uncertainty, and subjective uncertainty in business expectation surveys. They used these as indicators to document and quantify the enormous increase in economic uncertainty in the past few weeks. The exercise says that about half of the forecasted output contraction reflects a negative effect of COVID-19 induced uncertainty.

Al-Awadhi et al. (2020) performed a study and investigated whether contagious infectious diseases affect stock market outcomes. As a natural experiment, they used panel data analysis to test the effect of the COVID-19, on the Chinese stock market. The findings show that both the daily rise in the number of total confirmed cases and the number of total deaths caused by COVID-19 have significant negative effects on stock returns across all companies.

Zhang, Hu and Ji (2020) conducted a study that aimed to find the general patterns of country-specific risks and systemic risks in the global financial markets. It also analysed the potential consequence of policy interventions, and to what extent these policies may introduce further uncertainties into global financial markets.

Ashraf (2020) report on Stock markets' reaction to COVID-19 examined the stock markets' response to the COVID-19 outbreak. They used daily COVID-19 confirmed cases and deaths and stock market returns data from 64 countries. The study founded that the stock market reacted negatively concerning the growth in COVID-19 confirmed cases and this response differed over time depending on the stage of the pandemic.

Ozili and Arun (2020) conducted a study on the spill-over impact of COVID-19 on the global economy. They observed the impact of social-distancing norms on the economic activities as well as the stock market indices. Their results suggest that increasing number of lockdown days, monetary policy decisions and several international travel restrictions critically impacted the economic activities as well as the share prices.

Gormsen and Koijen (2020) performed a research on the impact of coronavirus on stock prices and its growth expectations used data from the aggregate stock market which was future dividend to quantify how investors' expectations about economic growth evolved across horizons in reaction to the pandemic and eventual policy responses until June 2020. They analysed the joint dynamics of short-term dividend futures and stock markets.

Zerenand Hizarci (2020) report on the impact of COVID-19 on the stock market where they took evidence by selecting a few countries was directed towards revealing the possible effects of the COVID-19 epidemic on stock markets. The study used daily data between 23 January 2020 and 13 March 2020 and possible reactions on stock markets has been found with Maki (2012). The results obtained suggested that all stock markets examined with total death act together in the long run.

In our study, we have used the data of the stock indices of a long period from 1st October to 15th June and divided it into timelines and phases to achieve more accurate results. We have not only taken into account the initial stages of the COVID-19 outbreak but also the later stages. We have even compared our results with the Global Index which makes our research paper unique and different from the others already existing in this topic.

DATA AND METHODOLOGY

In order to analyse the impact of COVID-19 on different economies of the world due to the lockdown and restrictions imposed, we have chosen the following countries:

India, The US, The UK, Russia, Brazil, and China

The first five countries are chosen as they stood among the top five most affected countries based on the number of COVID-19 cases as on 15th June 2020 whereas china is selected as it was the first country to be affected by the outbreak.

For the chosen countries, the following stock indices are chosen as these are considered to be the best representatives of the stock market in the given countries. In our study the Shanghai SE Composite represents China, NIFTY 50 represents India, S&P 500 represents. TheUS, FTSE 100 represents the UK, and BOVESPA represents Brazil. The Global Index

S & P 1200 is also taken into account to study the effect on the global market conditions.

Since the outbreak took place in China in late 2019, and then eventually spread to other countries in Asia, Europe, and other Continents in early 2020, we have divided our study into two timelines namely: 'China Timeline' and 'Other countries timeline'. Further, the 'China Timeline' has been segregated into four different phases depending upon the rise in the number of cases. The phases being the Pre-COVID phase (1st October 2019- 31st December 2019) where there was no cluster of cases reported officially, the initial phase (1st January-12th February 2020) when a cluster of cases was reported, the number of cases started to rise and WHO formed a Research and Innovation Forum to study the virus, the Main Phase (13th February- 10th March 2020) when WHO declared it as a Pandemic and the number of cases reached its peak in China and lastly the Recovery Phase (11th March - 15th June) when most of the affected cases recovered.

Similarly the 'Other countries Timeline' has been divided into three phases namely The Pre COVID phase(1st October 2019- 29th January 2020) when the affected cases were limited to china, The initial phase (30th January 2020- 10th March 2020) when the people started being affected worldwide, and lastly The Main Phase (11th March -15th June 2020) when

there was a steep rise in the number of cases which continues to increase even after 15th June when this paper is being written.

The daily returns of the above-mentioned stock indices from 1st October 2019 to 15th June 2020 are analysed. In both the timelines the initial, main, and recovery phase has been compared to the pre-COVID phase. Simple heteroscedastic t-tests are conducted. The T-test is a type of statistical test commonly used to find out if there is a significant mean difference between the two groups of data that might be related to each other. The data source of the closing values for the chosen indices is yahoofinance.com and investing.com.

HYPOTHESIS TESTING
Null Hypothesis
ð COVID 19 has no impact on the stock market i.e. there is no significant difference between the mean stock returns across periods

Alternative Hypothesis
ð COVID 19 has impacted the stock market i.e. there is a significant difference between the mean stock returns across periods

The null hypothesis will be rejected if t (calculated)> t (critical)

The change in daily return is calculated using the formula:

= (Present Day's Closing Value – Last Day's Closing Value) / Last Day's Closing Value * 100

RESULTS AND DISCUSSIONS
CHINA'S TIMELINE

Table No. -1: Results of China's Timeline

Phases Countries	Pre-COVID Phase	Initial Phase			Main Phase			Recovery Phase		
	Mean	Mean	T-values	P-values	Mean	T-values	P-values	Mean	T-values	P-values
China	0.08	-0.02	0.591	0.56	0.138	-0.144	0.887	-0.05	0.76	0.428
India	0.127	0.009	0.062	0.537	-0.89	2.574*	0.019	-0.04	0.373	0.71
US	0.151	0.134	0.11	0.931	-0.87	1.277	0.219	0.154	-0.007	0.994
UK	0.042	-0.01	2.238*	0.049	-1.21	2.346*	0.03	0.067	0.068	0.946
Russia	0.162	0.092	0.391	0.698	-1.27	2.318*	0.033	0.157	0.016	0.988
Brazil	0.185	0.028	0.599	0.552	-1.36	1.338	0.201	0.107	0.135	0.893
S and P Global 1200	0.155	0.136	0.14	0.889	-0.01	2.356*	0.036	0.19	0.02	0.984

Note: * represents 5% Level Significance

CHINA

The Pre-COVID Phase represents a small positive change as against the Initial Phase which shows some decline in the mean returns. The Main Phase shows marginal growth with the Recovery Phase showing insignificant fall. The above data shows that there is no significant difference caused to China's stock market due to COVID-19 which establishes the fact the Chinese economy is quite resilient to exigencies.

INDIA

A positive daily average return is found in the Pre-COVID Phase whereas almost no change in return was noticed in the Initial phase. The main phase witnessed a sharp decline in the daily mean return at 5% level significance. The recovery phase shows a marginally low fall in the mean return. This establishes the fact that the indirect effect of the coronavirus outbreak in China was seen in the Indian stocks in the main phase because of the interdependence between countries whereas no effect was seen in the other phases.

UNITED STATES OF INDIA

Initially, a positive daily average return is found in the pre-COVIDphase which slightly falls in the initial phase. There is a steep decline in the main phase to a certain extent which eventually takes a positive sign in the recovery phase. The results prove the fact that the spill-over effect of the coronavirus outbreak in China was not seen in the US stocks.

UNITED KINGDOM

A stable daily average return is seen in the pre-COVID phase. The decline in the daily return starts in the initial phase continuing to fall to a greater extent in the main phase as well. The returns again take a stabilized form in the recovery phase, a 5 percent level significant difference is found in both the initial and the main stage which shows that the UK faced significant effects because of the virus outbreak in China.

RUSSIA

As we have seen in the other countries, there is normal growth in the mean return in the pre-COVID phase, slightly declining in the initial phase, furthermore giving negative returns in the main phase. The recovery phase witnesses the growth of returns to a limited extent. The decline in the main phase caused by the spill-over effect of COVID 19 in China is significant enough to affect the economy of Russia.

BRAZIL

At first, stabilized positive daily average returns are observed in the first two phases which further sharply declines in the main phase recovering to some extent delivering positive returns in the recovery phase. Although there is a decline in the main phase, it is not significant enough.

S AND P GLOBAL 1200

The S & P Global 1200 is a weighted stock market index of global equities that sums up the performance of the major stock markets across the globe. It includes 31 countries and over 70% of global stock market capitalisation.

Hereit shows that there were stabilized positive returns in the first two phases and the main phase facing a huge drop in the mean returns. The last phase experiences a small growth. As the restrictions were imposed by the Chinese government on all economic activities caused by the increase in the number of COVID 19 cases, it led to the fall in the financial markets not only in China but also across the world especially between 13th February to 10th March.

OTHER COUNTRIES' TIMELINE

Table No. 2: Results of Other Countries' Timeline

Phases Countries	Pre-COVID Phase	Initial Phase			Main Phase		
	Mean	Mean	T-values	P-values	Mean	T-values	P-values
India	0.089	-0.52	2.048*	0.049	-0.039	0.288	0.774
China	0.031	0.048	-0.04	0.969	-0.05	0.50	0.618
US	0.132	-0.42	1.093	0.283	0.154	-0.05	0.96
UK	0.023	-0.762	2.070*	0.046	0.066	-0.12	0.904
Russia	0.16	-0.806	2.320*	0.027	0.157	0.009	0.992
Brazil	0.134	-0.79	1.256	0.220	0.107	0.047	0.962
S and P Global-1200	0.134	-0.556	1.84	0.077	0.15	-0.06	0.952

Note: * represents 5% Level Significance

INDIA

A stable daily average return is seen in thepre-COVID phase. The sharp decline in the mean returncan be seen in the initial phase which improves in the main phase but still remains negative. A 5% level significant difference is found in the initial phase which shows that the Indian stock market faced significant effects because of the virus outbreak and the Indian economy took a huge downturn.

CHINA

The statistical tests applied to China show that it had only marginal growth in the mean returns in the pre-COVID phase which is when it had started facing the increase in the number of COVID-19 cases in its territory. The returns remain constant in the initial phase. The main phase shows that the indirect effects of the spread of the virus across the globe can be found in its indices in terms of the negative returns.

UNITED STATES OF AMERICA

Initially, a positive daily average return is found in the pre-COVID phase which falls in the initial phase eventually taking a positive sign in the main phase. The results prove the fact that COVID 19 had an impact on the US stocks in the initial phase and the stock market further stabilized in the main phase. There was no significant difference in the returns found.

UNITED KINGDOM

As we have seen in the results of other countries, the UK in the pre-COVIDphase experiences small but positive returns. The United Kingdom's stock markets faced a huge shock in the initial phase when the restrictions were imposed and economic activities were brought down to minimise social contact to restrict the spread of the virus. After going through a significant change towards a negative side, it showed signs of recovery in the main phase.

RUSSIA

Before the pandemic struck in Russia in the early February, it was experiencing a significant growth in its pre-COVID phase. The initial phase, similar to the other major economies faced a huge plunge and reached a 5% Level Significance and led to huge losses for the investors. The main phase showed signs of recovery but only to a certain extent.

BRAZIL

At first, stabilized positive daily average returns are observed in the pre-COVID phases which sharply declines in the initial phase further recovering to some extent and delivering positive returns in the main phase. The decline in the initial phase caused by COVID-19 is not very significant enough to affect the economy of Brazil badly.

S AND P GLOBAL 1200

The Global Index shows correctly shows the summary of the results of all the major economies of the world. A positive daily average return initially turned into a steep decline in the initial phase when the pandemic spread everywhere. It turned out to be a major downfall but most of the economies can be seen recovering at a steady pace which is proved by the results of the main phase.

CONCLUSION

The COVID-19 pandemic has economically affected almost all the countries around the world. Though the virus continues to affect more and more people and the 'Other Countries' Timeline' has extended beyond 15th June, yet the following conclusions can be drawn.

In the case of the china timeline, we see that the impact on most of the countries is limited and short term. China, being the epicentre, holds his fort and proves to be quite resilient towards being drastically affected by the COVID-19 outbreak. With regards to the UK, India, and Russia, we can see that impact can be seen in their financial markets to a significant level whereas the US and Brazil face only limited impact. According to the Global Index, the spill-over effect of the pandemic in China can be seen in other countries in Asia, America, and Europe where the virus has just started to spread.

In the case of the Other Countries' Timeline, the results show that almost all the countries except China faced a significant downfall in the Initial Phase which ultimately took the road to recovery in the next phase. Both, the developed and the developing economies went through tough times. Whereas China faces small negative growth which can be seen as the indirect effect of the impact on the financial markets of all the other countries.

To conclude, we see that a bidirectional spill-over effect is seen between the countries of Asia, Europe, and America. When all the indices are compared to the Global Index, we see that almost the same level of fall and then a small recovery is seen. No economy is spared from the clutches of the pandemic and while this paper is being written, the

countries continue to fight their way through the recovery phase.

ACKNOWLEDGEMENT

REFERENCES

1. Al-Awadhi, A.M., Alsaifi, K., Al-Awadhi, A., and Alhammadi, S. (2020).Death and Contagious Infectious Diseases: Impact of the COVID-19 Virus on Stock Market Returns. *Journal of Behavioural and Experimental Finance, 27.*

2. Ashraf, B.D. (2020). Stock Markets' Reaction to COVID-19: Cases or Fatalities? *Research in International Business and Finance, 54.*

3. Gormsen, N.J., and Koijen, R. S. J. (2020). Coronavirus: Impact on Stock Prices and Growth Expectations. University of Chicago, Becker Friedman Institute for Economics Working Paper No. 2020-22, Available at SSRN: https://ssrn.com/abstract=3555917

4. Ozili, P. K., and Arun, T. (2020). Spillover of COVID-19: Impact on the Global Economy. Available at SSRN: https://ssrn.com/abstract =3562570

5. Scott, R. B., Nicholas, B., Davis, S.J., Kost, K.J., Sammon, M.C. and Viratyosin, T. (2020). The Unprecedented Stock Market Impact of COVID-19, NBER Working Papers 26945, National Bureau of Economic Research, Inc.

6. Sneezy Money (2020). *The Economist*

7. Spread and Shutter (2020). *The Economist*

8. WHO Timeline- COVID-19 (2020). *World Health Organization*

9. World Economic Forum, Weblink: https://www.weforum.org/agenda/2020/04/covid-19-action-call-8-apr/

10. World Economic Outlook Update (2020). *International Monetary Fund*

11. Zeren, F., and Hizarci, A. (2020). The Impact of Covid-19 Coronavirus on Stock Markets: Evidence from Selected Countries. MuhasebeveFinansÝncelemeleriDergisi, 3 (1), pp. 78-84. DOI: 10.32951/mufider.706159

12. Zhang, D., Hu, M. and Ji, Q. (2020). Financial Markets under the Global Pandemic of COVID-19. *Finance Research Letters.*

Footnotes

1. https://www.economist.com/finance-and-economics/2020/02/27/markets-wake-up-with-a-jolt-to-the-implications-of-COVID-19

2. https://espresso.economist.com/b0b9da-81cf357c8884a06de8ef72bea0

3. https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEO Update June 2020

4. https://www.weforum.org/agenda/2020/04/COVID-19-action-call-8-apr/