

Event Analysis of the COVID-19: Evidence from the Stock Markets of Twenty Highly Infected Countries

(Kajian Peristiwa Covid-19: Bukti daripada Pasaran Stok bagi Dua Puluh Negara Tertinggi Terkesan)

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ABSTRACT

The global lockout triggered by coronavirus has made the disease both a health problem and a global economic crisis. Such pandemic-inflicted movement control has adversely affected many facets of life and business. The present study aims to investigate the impact of such an unexpected outbreak on stocks in twenty highly infected countries, including the USA, Brazil, India, Russia, South Africa, Peru, Mexico, Chile, Spain, United Kingdom, Iran, Pakistan, Saudi Arabia, Italy, Turkey, Colombia, Bangladesh, Germany, France, and Argentina. The descriptive statistics and correlation estimates are reported negative returns and high volatility in the selected countries' stock indices during the epidemic. Empirical findings of event study methodology extracted from abnormal returns, average abnormal returns, and cumulative abnormal returns show significant impacts of coronavirus outbreak on the stock markets. The strict lockdown of cities, the closure of borders, the implementation of social distancing rules, the collapse in oil prices, the closure of all business activities, and other health interventions have exacerbated the uncertainty of the situation of the world's stock markets. The governments and stock exchange authorities should rationalize the financial policies and work together to contain such unprecedented events on stock markets because individual policy by each country may cause further challenging situations for the global financial market. Moreover, it is also useful to digitize companies and other similar operations to contain such a type of black swan incident that adversely affects the economies and damages the health system around the world.

Keywords: Coronavirus outbreak; stock returns; event study methodology
JEL Code : G01, G14, G15, G32, F65

ABSTRAK

Penguncian global yang dicetuskan oleh coronavirus telah menjadikan penyakit ini sebagai masalah kesihatan dan krisis ekonomi global. Pengendalian pergerakan yang disebabkan oleh pandemik ini telah mempengaruhi banyak aspek kehidupan dan perniagaan. Kajian ini bertujuan untuk mengkaji kesan wabak yang tidak dijangka terhadap stok di dua puluh negara yang sangat dijangkiti, termasuk Amerika Syarikat, Brazil, India, Rusia, Afrika Selatan, Peru, Mexico, Chile, Sepanyol, United Kingdom, Iran, Pakistan, Saudi Arab, Itali, Turki, Colombia, Bangladesh, Jerman, Perancis, dan Argentina. Statistik deskriptif dan anggaran korelasi telah melaporkan pulangan negatif dan turun naik yang tinggi dalam indeks saham negara terpilih semasa wabak ini. Penemuan empirik metodologi kajian peristiwa yang diambil dari pulangan tidak normal, pulangan abnormal rata-rata, dan pulangan abnormal kumulatif menunjukkan kesan ketara wabak coronavirus di pasaran saham. Penutupan bandar yang ketat, penutupan sempadan, pelaksanaan peraturan menjauhkan sosial, kejatuhan harga minyak, penutupan semua aktiviti perniagaan, dan campur tangan kesihatan yang lain telah memperburuk ketidakpastian keadaan pasaran saham dunia. Kerajaan dan pihak berkuasa bursa harus merasionalisasikan dasar kewangan dan bekerjasama untuk menahan peristiwa yang belum pernah terjadi sebelumnya di pasaran saham kerana dasar individu oleh setiap negara boleh menyebabkan situasi yang lebih mencabar bagi pasaran kewangan global. Lebih-lebih lagi, juga berguna untuk mendigitalkan syarikat dan operasi lain yang serupa untuk menahan jenis kejadian angsa hitam yang memberi kesan buruk kepada ekonomi dan merosakkan sistem kesihatan di seluruh dunia.

Kata kunci: Wabak Coronavirus; pulangan stok; metodologi kajian peristiwa
Kod JEL : G01, G14, G15, G32, F65

INTRODUCTION

According to the World Health Organization (WHO), Coronaviruses are a large group of viruses that may cause human or animal sickness. Numerous coronaviruses are known for causing respiratory infectious diseases ranging from natural cold to more serious diseases such as Middle East Respiratory Syndrome (MERS) and Severe Acute Respiratory Syndrome (SARS). The most recent coronavirus that is causing COVID-19 was unknown before the outbreak began in December 2019 in Wuhan, China. On 30 January 2020, WHO announced the coronavirus outbreak as a Public Health Emergency of International Concern (PHEIC) and declared it a pandemic on 11 March. Besides this COVID-19's crude mortality ratio (the number of reported deaths divided by reported cases) ranges from 3 to 4 percent, which is much higher than 0.1 percent fatalities for influenza¹.

The outbreak has triggered significant public health problems around the world. At the same moment, anxieties about the economic consequences are continuing to grow as households need to stay at home to control the transmission of the virus. Moreover, several studies have confirmed that the world is more vulnerable to the spread of fatal infectious diseases due to globalization that has accelerated travel, trade, and tourism worldwide (Ali et al. 2020). As a result, business leaders, policymakers, and market participants try to reassess perceptions of short, medium and, long-term economic growth. The Global Economic Prospects 2020 report by the World Bank estimates a 5.2 percent contraction in global GDP in 2020, the deepest global recession in eight decades (World Bank 2020).

Similarly, with the assumption that there is no other wave of the pandemic, Jackson et al. (2020), a report from the United States Congressional Research Service, estimates that the infection could reduce the overall economic growth of the globe by 3 to 6 percent in 2020, with a partial recovery in 2021. Furthermore, the increasing number of coronavirus affects stock markets worldwide. The FTSE 100 index, the Dow Jones Industrial Average, and the Nikkei 225 index plunged around 19.3, 13.3, and 5.2 percent from January-2020 to June-2020, respectively (Jones et al. 2020). Moreover, since the pandemic, all other countries have also been confronted with a major downturn and high volatility in their financial markets.

MOTIVATION AND CONTRIBUTION OF THE STUDY

The present study has attempted to analyze the behavior of stock returns around the pandemic. For that purpose, the author selected twenty highly infected countries, which include the USA, Brazil, India, Russia, South Africa, Peru, Mexico, Chile, Spain, UK, Iran, Pakistan, Saudi Arabia, Italy, Turkey, Colombia, Bangladesh, Germany, France, and Argentina. The motivation behind the stock market analysis around the global epidemic is to provide evidence-based insights and strategies for financial analysts, researchers, stakeholders, policymakers, and practitioners to understand the behavior of stock markets during such a health and economic crisis. Moreover, the pandemic had a drastic impact on not only ordinary persons, but also on investors. So, several studies looked at investors' perceptions and behavior during the pandemic, such as Ortmann, et al. (2020) who looked at investors' trading behavior in the UK, Salisu and Vo (2020) who looked at the predictability of stock returns associated with the news of the COVID-19 outbreak, Dhall and Singh (2020) who looked at herding behavior in the Indian stock market during the epidemic, and Zhang et al. (2020) analyzed the dramatic impact of the COVID-19 pandemic on the stock market risk of the world.

However, there is no study (to be best of the author's knowledge) that has used daily data of twenty highly infected countries and employed event study methodology as an econometric method except Liu et al. (2020). The authors (Liu et al. 2020) used the 20th of January 2020 date as the event (when the representatives of the National Health and Fitness Commission of the People's Republic of China broke the news that "new coronavirus could be transmitted among people") and took data till 18th March 2020. Nevertheless, the present study has taken the date of the first confirmed case as the event that varied from country to country, making the analysis more robust, and has used data of one year (from July 2019 to July 2020). Therefore, the present study will contribute to the growing literature in financial economics to analyze COVID-19 impact on the stock markets (Alfaro et al. 2020; Bai et al. 2020; Erdem 2020; Gharib et al. 2020; Kim et al. 2020; Ramelli & Wagner 2020; Salisu & Vo 2020; Zhang et al. 2020) with the new and updated data and events (Liu et al. 2020). The study has used the event study methodology for empirical analysis for each country.

The rest of the paper is organized in the following sections: Section 2 includes relevant studies and empiric literature, the data and methodology are covered in section 3, followed by empiric evidence in Section 4, and Section 5 contains a conclusion.

LITERATURE REVIEW

Although the COVID-19 is a new and young virus, several researchers have endeavored to estimate its dramatic impact on the global financial markets. Zhang et al. (2020) analyzed the dramatic impact of the COVID-19 pandemic on the risk in stock markets. They concluded that global financial market risks had increased considerably in reaction to the pandemic, hence made them highly volatile and unpredictable. Another research (Ramelli & Wagner 2020) assessed the market reaction to COVID-19, especially by internationally trade-oriented firms, and identified how a health disaster enlarged via

financial channels to conclude that corporate debt and cash holdings emerged as important value drivers of the firms. Liu et al. (2020) investigated the effect of coronavirus on stock markets of 21 countries. Their outcome confirmed that the stock markets of the Asian countries experienced a higher loss compared to other countries. Mazur et al. (2021) identified that firms in the US stock market reacted in various ways to the COVID-19 shock and exhibited extreme volatility and high loss in their returns.

Similarly, Erdem (2020) looked at stock market reactions to coronavirus announcements in 75 countries and found that stock markets were more volatile during the pandemic and the freedom index decreased. Similar findings documented by Bai et al. (2020) in the US, Japan, UK, and China stock markets. Gharib et al. (2020) employed the bootstrap method and detected the bubbles in the crude oil and gold markets during the COVID-19 pandemic. Gormsen and Koijen (2020) quantified the stakeholders' prospects about economic growth in response to COVID-19, using the equity market and dividend futures. Similarly, Alfaro et al. (2020) estimated that an unanticipated double up of COVID-19 infectious shrank the market return from 4 to 11 percent in the US Stock market. Kim et al. (2020) found an adverse impact of pandemic infection eruptions on the restaurant business in the USA. Demir et al. (2020) documented a negative relationship between cryptocurrencies and coronavirus cases. However, Cepoi (2020) examined the impact of COVID-19-related news on stock market return in the USA, UK, Germany, France, Spain, and Italy using panel quantile regression and Seemingly Unrelated Regression models observing asymmetry in stock markets in response to the coronavirus information. Antipova (2020) examined total cases, deaths, fertility rates, global economic indicators, global financial indicators, global trade indicators, food, and energy prices and declared the COVID-19 outbreak a Black Swan event.

Similar studies also have used various types of information as an event and check the behavior of financial institutions and stock returns around this event. Hoang et al. (2020) took the announcement on information disclosure regulation as an event in the Vietnam stock market to examine the reaction of the stock returns. They documented that returns remained negative before the announcement on information disclosure regulation and became positive after the event. Interestingly, Ahmed et al. (2020) took the American Presidential Election, 2016 as an event and stated that all the major indices of the USA stock market signaled a drop on winning of Trump. Markoulis and Katsikides (2020) examined the variation in stock profit in Cyprus due to terrorist attacks and found a detrimental effect. Besides, there are many announcements and information used as an event by various studies compiled by Sorescu et al. (2017). Some studies used dividend announcements to analyze the behavior of the stock returns in Pakistan (Chaudhary et al. 2016; Nazir et al. 2010; Nishat & Irfan, 2004; Tanveer & Jamil 2019).

METHODOLOGY

The present study uses a prominent empirical methodology of analyzing a particular event that originated in mid of the twentieth century (Dolley 1933) and employed by several studies (Chaudhary et al. 2016; Kim et al. 2020; Markoulis & Katsikides 2020; Nazir, et al. 2010; Nishat & Irfan 2004; Tanveer & Jamil 2019) known as event study methodology (ESM). The methodology poses several steps, which are explained as follow:

In the first step of the methodology, the researcher ought to identify a specific event, which is the main point of all the empirical investigations. In our case, this event is COVID-19 as this study takes the dates of the first confirmed case in each country as the event.

The subsequent step is to calculate normal returns for each major index of the countries. The simple way of doing this is to convert the closing price of the indices into logarithmic form and then subtract the lagged value from the current value given as follow:

$$R_{it} = \log P_{it} - \log P_{it-1} \quad (1)$$

Where R_{it} is the normal return of index i at time t , P_{it} is the closing price of the index i at time t , and P_{it-1} is the lagged value of the index.

After choosing an event and calculating the normal returns, the following step is to specify the estimation window. Campbell et al. (1997) and Mahmood et al. (2011) proposed 100 days and -21 to -270 days' estimation windows correspondingly. Moreover, Peterson (1989) considered that it is better to use 100 to 300 days' estimation window for daily series and 24 to 60 months for a monthly series. Some studies used different estimation windows like Chaudhary et al. (2016) used 240 days, Tanveer and Jamil (2019) applied 100, and 300 days, Liu et al. (2020) opted (-1, -120), (-1, -150) and (-1, -180) days, and Markoulis and Katsikides (2020) picked 120 days estimation windows prior to the event.

The present study uses 100 days before the event as an estimation window to measure the mean value of the returns. The rationale behind choosing a 100-day event window is the literature that has proposed and used the 100-day estimation window. Furthermore, the analysis has taken data from July 15, 2019, to July 15, 2020, and the pandemic started spreading in December 2020. Moreover, most of the countries reported their first case in January and February 2020. As a result, from July-2019 to December-2019, there were approximately 130 working days, which were the maximum days for the estimate window. Besides that if the study uses an estimation window of more than 100 working

days, the value of the estimation window might be affected by other incidents that occurred in the given countries as there are numerous uncertainties attached with the stock markets; consequently, a long estimation window may be inadequate (Liu et al. 2020).

In the next stage, to calculate the abnormal returns for the empirical analysis, the abnormal returns or the errors are calculated by subtracting the average value (unconditional mean) of the returns (calculated from the estimation window) from the actual values of the normal returns. The formula for the excess returns is given as follow:

$$AR_{it} = R_{it} - \bar{R}_t \quad (2)$$

Where AR_{it} denotes abnormal or excess returns for index i at time t , R_{it} shows normal returns of the index, and \bar{R}_t represents the average value of the returns calculated from the estimation window (100 days before the event). These excess returns are calculated for a ninety-one days' event window, a composition of 30 days before the event and 60 days after the event that is the dates of the first reported case in each country.

The event methodology now purposes to calculate average abnormal returns (AAR). The formula for AAR is given as:

$$AAR_t = \frac{1}{N} \sum_{i=1}^N AR_{it} \quad (3)$$

Where AAR_t is average abnormal returns, AR_{it} is abnormal returns and N is number of events, where number of events depict the total number of countries in our study. These AAR are calculated for the event window.

In the following step of the event study methodology cumulative normal return are calculated for 91 days event window. The equation (4) shows the formula for the calculation of cumulative abnormal returns.

$$CAR_{it} = \sum_{t=1}^N AR_{it} \quad (4)$$

Where CAR_{it} represents cumulative abnormal returns for the index i at time t , AR_{it} correspondingly represents abnormal returns and N is the time span of the event windows.

The last step is to calculate the statistical significance of the estimated abnormal returns and cumulative abnormal returns with the help of t-test showing in equation (5).

$$t = \frac{AR_t \text{ or } AAR_t \text{ or } CAR_t}{\text{Standard Deviation}} \quad (5)$$

H_0 = The pandemic has not a significant impact on the stock returns

H_1 = The pandemic has a significant impact on the stock returns

DATA DESCRIPTIONS

The 20 most affected countries by the coronavirus were selected from the data given on the website worldometers.info on July 23, 2020. Then, the study took daily data from July 15, 2019, to July 15, 2020, of the major indices of these highly infected countries from yahoo finance and investing.com websites. There were 21,175,959 confirmed cases on August 14, 2020, with 83 percent (17,553,464) from the selected twenty countries. The descriptive statistics are given in Table 1. The first country with the highest number of covid-19 cases was the United States of America. The descriptive statistics show that the average price of the NASDAQ-100 index from July 15, 2019, to July 15, 2020, is 18310.3 with only 0.1 percent average returns. The maximum returns on the index are 1.8 percent, with the lowest return was -4.8 percent for the given period.

Moreover, the overall sum of the returns was positive for the respective period. However, the sum of returns of Brazil's Bovespa index was negative. Similarly, the sum of the returns of the major indices of India, South Africa, Peru, Mexico, Chile, Spain, United Kingdom, Saudi Arabia, Italy, Colombia, Bangladesh, and France was found to be non-positive for the given period with the lowest cumulative returns in Colombia (-14.7 percent) followed by Bangladesh (-11.5 percent) which revealed that these countries faced massive loss during the pandemic period. These descriptive statistics are highly supported by (Bai et al. 2020; Cepoi 2020; Erdem 2020) who have found uncertainty and loss in various stock markets during the pandemic.

Furthermore, the other exciting feature of the descriptive statistics is that the average returns were approximately zero (0 percent) in all given countries. The maximum and minimum values and the standard deviation describe the variation and dispersion in the values of the indices. From Table 1, it is revealed that the highest difference between the uppermost and the lowermost price occurred in Brazil's Bovespa Index that was 55958.01BRL (Brazilian real), followed by Turkey with 39309.93TL (Turkish Lira) range and hence, both had the highest value of the standard deviation, 13507.86 and 9115.67, respectively. Besides that almost all countries' index prices and returns show a negative skewness, illustrating the risk of a left tail "black swan event" (Taleb 2007) in terms of the pandemic (Antipova 2020)². The findings

match the observed volatilities in different financial markets during the worldwide epidemic (Bai et al. 2020; Erdem 2020; Gharib et al. 2020; Zhang et al. 2020). In Appendix A, graphical analysis is depicted the returns of the indices of each region. The reader can easily identify the significance of the pandemic effect on the stock returns after the first case reported in the country. The returns of the indices were decreased significantly after the spread of the pandemic and exhibited fluctuations for around two months after the first confirmed case of the coronavirus in each country.

Table 2 represents the correlation among the values of the indices of the selected countries from 15 July 2019 to 15 July 2020. Table 2 depicts a positive correlation among almost all the given indices that reveal that COVID-19 affected all the countries' stock markets in the same way. Indices of many countries like Brazil, India, Peru, Mexico, UK, Italy, Germany, France, and Spain have more than 90 percent positive correlation. However, the NASDAQ-100 index (United States America) is not showing a strong positive (more than 80%) association with any country; rather, it has negatively related with Peru, Mexico, Chile, Spain, UK, Iran, Saudi Arabia, Colombia, Bangladesh, and France. The reason behind this opposite relation is the FAANG (Facebook, Amazon, Apple, Netflix, Google) and Microsoft companies' revenue which was increased by 62% during the pandemic period (Ritholtz 2020). Furthermore, similar correlation metrics reported by Cepoi (2020) for the USA, UK, Germany, France, Spain, and Italy.

GALLEY PROOF

TABLE 1. Statistical Description of the Prices and Returns of the Indices

	America (NASDAQ-100)		Brazil (Bovespa Index)		India (NIFTY 50)		Russia (MOEX Index)		South Africa (Top 40 (JTOPI))		Peru (Lima General)		Mexico (IPC)		Chile (CLX IPSA)		Spain (IBEX 35)		UK (FSTE 100)	
Statistics	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns
Mean	8525.3	0.0511	99516.5	-0.0088	10908.6	-0.0154	2796.6	0.0006	48542.33	-0.0001	18310.31	-0.0381	40748.04	-0.0275	4425.42	-0.0399	8509.61	-0.0403	6854.15	-0.0343
Standard Deviation	803.9	0.9416	13507.9	1.2091	1169.2	0.8694	203.6	0.6868	3490.435	0.8241	2175.41	0.6446	3527.29	0.6523	541.688	0.9735	1138.26	0.8715	729.92	0.7712
Kurtosis	-0.654	9.0996	-0.4199	11.798	-0.4881	12.6911	0.3031	9.9987	4.0921	7.2788	-0.8387	13.5053	-1.0291	2.6771	-0.3694	12.9616	-1.1594	14.9356	-0.7998	10.2182
Skewness	0.4964	-0.8599	-0.7169	-1.5165	-0.7522	-1.5411	-0.2409	-0.9398	-1.9497	-0.9882	-0.7991	-2.0591	-2.0591	-0.5346	-0.4784	-0.7333	-1.6791	-0.6568	-1.9839	-0.7998
Minimum	6994.3	-5.6471	63569.6	-6.9465	7610.3	-6.0383	2112.6	-3.7549	34239.3	-4.5385	13538.79	-4.7813	32964.22	-2.8828	2876.03	-6.6081	6107.23	-6.5801	4993.89	-4.9997
Maximum	10666	4.1677	119527.6	5.6557	12362.3	3.6482	3219.9	3.2289	52735.8	3.4341	20919.65	1.7651	45902.68	2.0602	5192.39	3.3695	10083.65	3.269	7686.61	3.7639
Sum	2.1227	12.673	24.7796	-2.1904	2.7162	-3.8414	0.6963	0.1627	12.0871	-0.2481	4.5592	-9.4505	10.1463	-6.8313	1.1019	-9.9002	2.1188	-10.014	1.7066	-8.5211
	Iran (TEPIX index)		Pakistan (KSE 100)		Saudi Arabia (Tadawal All Share)		Italy (FTSE MIB)		Turkey (BIST 100)		Colombia (COLCAP)		Bangladesh (DSE 30)		Germany (DAX)		France (CAC 40)		Argentina (MERVAL)	
Statistics	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns	Price	Returns
Mean	82.0328	0.0636	35340.31	0.0187	7679.25	-0.0323	22905	-0.0186	105378	0.0331	1434.699	-0.0591	1614.894	-0.0462	12136	0.0014	5344.919	-0.0189	35640	0.0288
Standard Deviation	40.9241	4.5191	4045.41	0.7108	694.345	0.6631	2828.99	0.9136	9115.67	0.6894	236.1552	0.9495	195.8171	0.5661	1188.46	0.8653	613.3591	0.8549	6014.52	2.0987
Kurtosis	-0.9469	99.6584	-0.9798	3.6949	-0.4701	10.3479	-0.8651	24.5988	-0.6644	6.3268	-1.3066	17.4493	-1.2958	17.0066	0.4335	11.1704	-0.7361	10.3137	-0.9478	38.5441
Skewness	0.9413	-0.0474	0.3729	-0.9688	-0.4448	-1.555	-0.5272	-3.0595	0.1293	-1.2213	-0.6646	-1.0685	-0.1044	1.2733	-0.9771	-1.0228	-0.6938	-1.5454	-0.2134	-4.1788
Minimum	38.9856	-47.5902	27228.8	-3.0845	5959.79	-3.7716	16286	-7.7782	84246.2	-3.6551	894.0345	-5.7679	1203.43	-2.7771	8441.7	-5.6696	3754.8	-5.6885	22087	-20.712
Maximum	163.675	47.7091	43218.7	2.0342	9075.55	2.9668	27675	3.4741	123556.1	2.5234	1676.495	5.4155	1929.09	4.2061	13789	4.5228	6111.24	3.4987	48881	4.2444
Sum	0.0204	15.8832	8.7997	4.6452	1.9121	-8.5289	5.7033	-4.6359	26.2391	8.1994	0.3571	-14.661	0.4021	-11.558	3.0221	0.3565	1.3331	-4.6905	8.8744	7.1447

Note: Names of the indices are given in parentheses
Source: Author's own calculations

TABLE 2. Correlation Among the Values of the Indices

	America	Brazil	India	Russia	South Africa	Peru	Mexico	Chile	Spain	UK	Iran	Pakistan	Saudi Arabia	Italy	Turkey	Colombia	Bangladesh	Germany	France	Argentina	
America	1																				
Brazil	0.1367	1																			
India	0.0584	0.9543	1																		
Russia	0.4178	0.8721	0.8304	1																	
South Africa	0.3524	0.8462	0.8186	0.7729	1																
Peru	-0.1371	0.9196	0.9027	0.6950	0.7738	1															
Mexico	-0.0446	0.9194	0.8809	0.7906	0.7299	0.9345	1														
Chile	-0.2600	0.8101	0.8439	0.5554	0.7465	0.8566	0.7742	1													
Spain	-0.1685	0.8970	0.8684	0.7095	0.6895	0.9531	0.9492	0.8035	1												
UK	-0.1406	0.9175	0.9042	0.7212	0.7918	0.9730	0.9243	0.8870	0.9542	1											
Iran	-0.3704	0.2751	0.3409	0.0738	0.2636	0.3495	0.3681	0.5224	0.3475	0.3841	1										
Pakistan	0.4764	0.6786	0.6250	0.8272	0.5113	0.5124	0.6364	0.2530	0.5633	0.4963	-0.2194	1									
Saudi Arabia	-0.1162	0.8506	0.8472	0.6368	0.8000	0.9011	0.7671	0.8742	0.8166	0.9105	0.2522	0.3662	1								
Italy	0.0575	0.9646	0.9379	0.8646	0.8001	0.9295	0.9531	0.7963	0.9399	0.9288	0.3000	0.6787	0.8172	1							
Turkey	0.6385	0.6896	0.5975	0.8451	0.6844	0.4650	0.5436	0.2656	0.4454	0.4550	-0.1857	0.8121	0.4240	0.6252	1						
Colombia	-0.2815	0.8845	0.8964	0.6966	0.6693	0.9242	0.9027	0.8920	0.9398	0.9445	0.4227	0.4592	0.8574	0.9196	0.3490	1					
Bangladesh	-0.7608	0.4070	0.4762	0.0542	0.2651	0.6272	0.4781	0.7413	0.5859	0.6377	0.5754	-0.1839	0.6406	0.4390	-0.2914	0.6962	1				
Germany	0.3371	0.9457	0.9182	0.9089	0.9045	0.8352	0.8603	0.7186	0.8037	0.8327	0.2428	0.7216	0.7602	0.9334	0.7734	0.7692	0.2295	1			
France	-0.0176	0.9356	0.9084	0.7969	0.7643	0.9464	0.9552	0.7903	0.9795	0.9498	0.3201	0.6612	0.8132	0.9644	0.5717	0.9103	0.4904	0.8797	1		
Argentina	0.7358	0.3373	0.2880	0.4855	0.5260	0.1440	0.1216	0.0695	0.0448	0.1452	-0.4359	0.4810	0.2772	0.2172	0.6737	0.0063	-0.4290	0.4452	0.1514	1	

Source: Author's own calculation

RESULTS OF THE EVENT STUDY METHODOLOGY

Considering the literature, the average abnormal returns for all countries, abnormal returns, and cumulative abnormal returns of each country presented in this section are calculated by 100 days' estimation window under event study methodology. Average abnormal returns depicted in Table 3 are showing that the COVID-19 has a substantially significant impact on the stock returns of the selected countries. Generally, each country started to close its business activities to contain the spread of the virus, which is clearly portrayed in Table 3 as the values of AAR become statistically highly significant after about 11 days of the event. Moreover, the values remain significant until the 60th day after the confirmation of the first case in the countries. Besides being statistically significant, the AARs are non-positive, revealing a massive loss in the stock markets. Besides the shutting down of the businesses, the strict worldwide lockdown, the ceasing of borders, the execution of social distancing policies, the downfall in fuel prices, and health crisis are main reasons for plunged in the global stock returns. Furthermore, the AAR values are statistically insignificant before the event that strongly indicates that the epidemic did not have an impact before it occurred, which appears to advocate a "black swan event" because not even one country could predict the severity and catastrophic effects of the event on an economy (Antipova 2020; Taleb 2007).

TABLE 3 Results of Average Abnormal Returns for All Countries

Days	AAR	Days	AAR	Days	AAR	Days	AAR
-30	0.0006	-7	-0.3856	16	-8.9556*	39	-11.287***
-29	0.0302	-6	-0.4279	17	-8.7849*	40	-11.266***
-28	-0.0229	-5	-0.6363	18	-9.1034**	41	-10.877***
-27	0.0645	-4	-1.0368	19	-9.1579**	42	-10.561***
-26	0.1098	-3	-1.1963	20	-9.2145**	43	-10.359***
-25	0.0865	-2	-1.4213	21	-9.0472**	44	-10.167***
-24	-0.0553	-1	-1.5752	22	-9.1198**	45	-10.181***
-23	-0.0273	0	-2.0051	23	-8.8505*	46	-9.7606**
-22	0.0981	1	-2.4588	24	-8.7812*	47	-9.5974**
-21	0.2203	2	-2.5104	25	-9.2793**	48	-9.7084**
-20	0.1095	3	-2.9590	26	-9.3399**	49	-9.7042**
-19	0.1624	4	-4.3682	27	-9.8986**	50	-9.6183**
-18	0.0882	5	-4.5547	28	-10.164***	51	-9.9340**
-17	0.1152	6	-5.2753	29	-10.718***	52	-9.5150**
-16	-0.0940	7	-5.8753	30	-11.461***	53	-9.2434**
-15	0.0589	8	-6.4647	31	-11.909***	54	-9.1046**
-14	0.0163	9	-7.1551	32	-12.069***	55	-9.2270**
-13	0.0582	10	-7.3420	33	-12.206***	56	-8.9632*
-12	0.0003	11	-8.1212*	34	-12.411***	57	-8.6268*
-11	-0.0035	12	-7.6527*	35	-12.549**	58	-8.3415*
-10	0.0464	13	-7.7215*	36	-12.071***	59	-8.0695*
-9	-0.0237	14	-7.4245	37	-11.896***	60	-7.7455*
-8	-0.2942	15	-8.2043*	38	-11.552***		

Note: *, **, and *** represent 10%, 5%, and 1% level of significance, respectively.

Source: Author's own work.

The estimated abnormal returns for each country's index are given in Table 4. The values of abnormal returns revealed that the pandemic has a statistically significant impact on the stock markets of all given countries. Analogous to the AAR, approximately all values of the excess returns are negative after the confirmation of the first case of coronavirus in all countries due to the "Black Swan" event in the form of coronavirus epidemic.

On August 14, 2020, the COVID-19 data provided by Worldometer³ documented that United States of America had the highest number of the confirmed cases tally reached to 5,431,381 (see Table 6). According to Schumaker (2020), on January 22, 2020, the first coronavirus case was diagnosed in a man from Washington State who travelled to Wuhan. Moreover, the first locally transmitted case was suspected on February 26, 2020, more than a month after the imported case. However, there was no lockdown imposed by the authority so far. Nevertheless, stay at home order initially placed at California State on March 19, 2020, about two months after the date of the first confirmed case. Subsequently, other States like Nevada, Illinois, New Jersey, and New York, etc., restricted the social gathering, stores, and non-essential businesses (First day to stay 2020).

The abnormal returns are given in the second column of Table 4 advocate the above story that after the first reported case on January 22, 2020, there is no significant value of the abnormal returns up to one month as businesses were not restricted by the authority. However, after placing the lockdown on March 19, 2020, several values of the abnormal returns calculated for the NASDAQ-100 index are statistically significant.

The interesting thing is that some significant values are positive, and others are negative, revealing an oscillating pattern. The explanation why big tech stocks performed so well is that these companies conduct a sizeable proportion of their business outside of the United States, where the coronavirus was under better control. As Kopf (2020) stated that about 40 to 50 percent of FAANG (Facebook, Amazon, Apple, Netflix, Google) and Microsoft companies' revenue earned outside the US. Similarly, Bloomberg Business News, an international news agency, estimated that the value of these six

stocks has increased by more than 62 percent since March 2020 (Ritholtz, 2020). A similar pattern could be found in Table 5, but CAR values are negative, advocating a massive cumulative loss in stock returns in America. Therefore, despite the increase in the FAANG and Microsoft companies' revenue, the overall stock market faced loss. The results of the study were also supported by (Alfaro et al. 2020; Bai et al. 2020; Erdem 2020; Kim et al. 2020), which also identified serious effects of COVID-19 on the American stock market.

Brazil reported the second-highest number of confirmed cases of COVID-19 tally touched 3,229,621 on August 14, 2020. Many reports say that the Brazilian authorities reacted in contradiction to the pandemic, and the confrontation between the president and the state governors triggered the coronavirus outbreak. The first coronavirus case was reported on February 25, 2020, imported from Italy (Paulo 2020). On March 21, 2020, the Brazilian authority issued a lockdown order for non-essential businesses at Sao Paulo, Brazil's vibrant financial center and the world's most populous (12.18m) cities (Ribeiro, 2020). On March 27, 2020, the country banned foreign air traveling, but the president ignored and discouraged social distancing (Fonseca & McGeever 2020; Morgan 2020). In April 2020, several states imposed a lockdown to curb the spread of the virus ("Belém & 9 other c," 2020). From Table 4, it can be noted that abnormal returns are significant on the event day. About 20 days after the event, there are negative and positive values that are statistically significant, showing the substantial impact of the pandemic. However, after 20 days, no statistically significant value observed which might be the result of the ignorant and avoidance of lockdown of the businesses by the government of Brazil, where governors supported lockdown. However, the president called the virus "a little flu". Hence, the responses of 27 state and district governments of Brazil varied extensively. Although ARs show an oscillation pattern, the picture becomes more apparent if we look at Table 5, where the values of CAR are negative and statistically significant from 11th day to 60th day, demonstrating up to 25 percent cumulative loss in the stock market of Brazil.

The first case was reported in India, a 1.3 billion population country, on January 31, 2020. The Indian government imposed a lockdown in about five phases (Bansal, & Hasin, 2020). To contain the spread of coronavirus first phase of the lockdown was placed on March 25, 2020, when the total tally reached only 500 (Gettleman & Schultz 2020). The results given in Table 4 depict the significant impact of the COVID-19 on the values of the NIFTY 50 index. Nevertheless, these significant values are observed after 26 working days of the event, which clearly shows the impact of increasing coronavirus cases and lockdown by the government. This notion becomes more apparent when we look at the values of cumulative abnormal returns in Table 5 that demonstrates significant negative values of the NIFTY 50 index after about one and a half month from the event date. Moreover, these values remain negative and significant up to the 60th day showing the persistence of the pandemic influences on the stock market.

Russia is a transcontinental country, has the highest cases of coronavirus in Europe and the second highest in Asia reached a total tally to 912,823 on August 14, 2020. The first case was detected on January 31, 2020, imported from China (First two cases, 2020). Russia banned the entry of Chinese citizens on February 18, 2020, and all non-citizens on March 17, 2020 (Kantis, et al., 2020). Later, on March 25, 2020, President Putin ordered his nationals to stay home to combat the epidemic. The results of the event study methodology depicted in Table 4 show that most of the values of abnormal returns are negative onward to the date of the first confirmed case. Moreover, many statistically significant values of the excess returns can be observed after the event, which reveals the substantial impact of the epidemic and the subsequent impact of a double-hit from a dropped in oil prices on the MOEX index (Ostroukh 2020). Furthermore, cumulative abnormal returns illustrated in Table 5 remain non-positive with a persistent decreasing trend, which becomes statistically significant after 24 business days. Moreover, these values remain negative and significant up to the 60th day showing the persistence of the virus's effect on the stock market.

South Africa is the fifth most affected worldwide country from the novel coronavirus reached tally to 572, 865 on August 14, 2020. The first virus-infected case, a 38-years-old male who traveled to Italy, was reported on March 5, 2020 (Maja 2020). Unlike the Brazilian President, the President of South Africa, Mr. Matamela Cyril Ramaphosa, immediately imposed restrictions on traveling and closed schools on March 18, 2020, to contain the outbreak (Ramaphosa, 2020). Subsequently, on March 27, the country's government imposed a nation-wide lockdown for keeping social distancing to combat the COVID-19 (Kantis, et al. 2020). The effect of immediate lockdown and travel restrictions can be seen in Table 4, where abnormal returns are significant right after the event. Like the other countries, the values of the excess returns are negative and significant that symbolizes a detrimental effect of the pandemic on the FTSE/JSE Top40 Index. Moreover, the values of cumulative abnormal returns in Table 5 are also significant and negative immediately after the confirmation of the first COVID-19 patient. The interesting thing about the econometric results of South Africa is that there are not any statistically significant values observed after 24 working days of the event. On one side, this happened is due to the early response by the government, and on another side due to gradually easing restrictions on nation-wide lockdown from level 5, the most restrictions, to level 1, normal routine (Statement by President 2020).

Peru, a South American country, is also infected by this worldwide outbreak, having a total of 507,996 confirmed cases till August 14, 2020, and being the sixth most affected country globally. The first confirmed case was detected on March 6, 2020, in a 25-year-old person (Garrison 2020). Like South Africa, the representatives of Peru instantly responded and declared a nation-wide lockdown by closing the country's boundaries, confining local travel, and disallowing unnecessary business actions excluding the businesses related to food, medical, paramedical, financial, and pharmaceutical facilities. This early lockdown to contain the coronavirus's spread seriously affected IGBVL. The values of the abnormal returns become significant just after the first confirmed case. It is also worth noted that during the same week, the first

confirmed case was reported in South American neighbors Argentina and Chile, which influenced the stock markets of these countries. Although most of the excess returns remain non-positive, they turned to be insignificant after eighteen working days. However, cumulative abnormal returns in Table 5 remain highly negative and significant up to the 59th days exhibiting approximately 17 percent cumulative loss in the stock market of Peru.

The next most infected country is Mexico that reported the first case on February 28, 2020 (Lopez-Mejia, (2020). In August 2020, the COVID-19 death count turned into the third-highest (Coronavirus: Mexico's death, 2020). After two weeks from the first case date, Mexico closed all public and private schools to mitigate the threat of community spread of COVID-19 ("Wisconsin governor closing," 2020). According to BBC news, most of the economic activities were restricted from March 23 and implemented social distancing rules (Coronavirus: Mexico's death, 2020). Abnormal returns of the BMV IPC index of the Mexican Stock Exchange in Table 4 showing the substantial impact of the epidemic and subsequent lockdown as many values of the excess returns are statistically significant and negative. Furthermore, the cumulative returns in Table 5 turn negative over about minus thirteen percent.

In Chile, the first confirmed case of the coronavirus was reported on March 3, 2020 ("First confirmed coronavirus," 2020). The country's government introduced countrywide selective quarantines on the zones with high frequencies of the epidemic (Abramovich 2020). The calculated values of the abnormal returns depict a significant impact after the event. Moreover, the cumulative impact remained significant up to 23 working days, with the highest value approximately minus 20% of returns. However, during that period, the values of both estimated variables remain insignificant due to the selective quarantine strategy adopted by the government. Nevertheless, this selective lockdown was turned to mandatory total quarantine after a 60 percent spike in COVID-19 infections on May 13, 2020 after around two and half months of the first confirmed case.

Spain confirmed the first coronavirus infected on January 31, 2020 (Chavez, 2020). The country canceled all flights for Italy on March 10 with 1,622 registered coronavirus cases at the time and declared a state emergency on March 14 (Parra & Wilson 2020). The estimated values of abnormal returns of the Spanish stock market index IBEX-35 remain insignificant about 24 working days after the event because of not declaring significant precautionary measures to contain the spread of the pandemic during these days. However, after the state emergency declaration and imposing restrictions on March 14 (one and a half months after the first confirmed case), the nonessential businesses were closed. Hence, the index suffered the subsequent lockdown as the excess returns' several values become statistically significant. A similar trend can be seen in Table 5, where initially cumulative abnormal returns are positive insignificant with a very small magnitude. Nevertheless, the returns plunge with highly non-positive and statistically significant values. Moreover, these returns remain negative and significant up to the 60th day, depicting a considerable loss (20%) in stocks during the epidemic. Cepoi (2020) also detected asymmetry in Spanish stock market in response to COVID-19-related news.

United Kingdom reported the coronavirus's first confirmed case on January 31, 2020 (UK confirms first, 2020). The government did not substantially respond to the worldwide outbreak and avowed the virus a severe and imminent threat to public health without practically taking the actions (Secretary of State, 2020). Later, on March 24, Boris Johnson announced a strict lockdown across the country. Similar to Spain, abnormal returns are insignificant for about 25 working days after the event. Due to strict restrictions on the businesses and epidemic outbreaks, the returns are highly statistically significant after 25 days. Moreover, cumulative abnormal returns are also substantially significant after 28 working days with a minus 19 percent cumulative loss. Furthermore, (Bai et al. 2020; Cepoi 2020; Erdem 2020) also found that the British stock market was more volatile during the pandemic.

Pakistan has also been hit by the global pandemic, with the first case of COVID-19 being identified on February 26, 2020 (Ilyas et al. 2020). On August 14, 2020, there were about 287,300 confirmed cases, 265,215 recoveries, and 6,153 deaths in the country. The country suspended all international flights on March 21 to limit coronavirus spread (Junaidi 2020). On March 13, the government of Pakistan ordered to close all educational institutions, restricted international travel, barred large public gatherings and shut down the western borders. On March 24, the nation moved much closer to a full lockdown to contain the worldwide pandemic (Lockdown begins, 2020). The estimated abnormal returns of the KSE-100 index in Table 4 illustrate the substantial impact of the pandemic as the returns are statistically significant. Moreover, the cumulative abnormal returns are also highly negative and significant after 12 working days of the event. The highest cumulative loss for the selected time faced by the KSE-100 index is about 23%.

Like Pakistan, Saudi Arabia also detected the first coronavirus infection person on March 2, 2020, traveled to Iran (Saudi Arabia announces, 2020). The country banned international flights on March 12 and imposed restrictions on domestic flights and road transport on March 24, and a curfew was put into place in various cities. The event study methodology's results calculated from Tadawul All Share Index (TASI) in Table 4 represent a few statistical significant values of abnormal returns. In contrast, significant and non-positive values of cumulative abnormal returns after the event date due to shut down businesses, historically crashing oil price, and suspension of the pilgrimage entry in Hajj as the country heavily relies on them. Hence, the epidemic considerably influences stock returns.

Italy has a total of 252,809 confirmed cases of the virus on August 14, 2020. The first case of the coronavirus was reported on January 31, 2020 (Severgnini 2020). However, the country's government closed all shops and venues on March 11 (Donato, 2020). It declared a nationwide lockdown on March 24 after a 24% increase in virus-infected persons ("Coronavirus: Italy extends," 2020). Due to the delay in the Italian government's pandemic response, the estimated values of the excess returns are statistically insignificant about 14 days after the event. Then only a few values have become

significant. Similarly, cumulative abnormal returns remain insignificant for 26 working days after confirming the first case, which portrays Italy's not strictly imposing restrictions on social gatherings and businesses. After imposing nationwide lockdown and business restriction on March 24, the stock returns plunge, which can be seen in Table 5, where cumulative abnormal returns are significant with high negative magnitude and remain significant and negative up to 60 working days. Cepoi (2020) findings also support the outcomes of this study.

Turkey reported the first confirmed case of COVID-19 on March 11, 2020 (Sabah, 2020). The country suspended flights to 9 highly infected European countries on March 13 and imposed a strict lockdown due to a surge in the case on March 27 to confine the possible spread of the virus (Akin, 2020). One of the interesting things about the Borsa Istanbul 100 Index (BIST 100) is that the estimated abnormal returns are significant not only after the event but also before the first confirmed case of the COVID-19. However, these are small in numbers. On the other hand, the values of cumulative abnormal returns remain significant and negative with high magnitude after 47 working days of the event. Moreover, Colombia portrays abnormal returns and cumulative abnormal returns similar to Turkey, except it does not have any statistically significant value before the first confirmed case reported on 6 March (Arias 2020). Bangladesh confirmed the first coronavirus case on March 8, 2020 (Sakib 2020), and imposed a strict countrywide lockdown on March 25 (Kamruzzaman & Sakib (2020)). The values of the AR are significant about 11 days after the event, and the remain upcoming values are insignificant due to the unavailability of data from 1st April to 30th May 2020.

In Germany, on January 27, 2020, the first coronavirus case was confirmed in Bavaria ("Confirmed coronavirus case," 2020). On February 26, Germany's health minister said that "the country was at the beginning of an epidemic" closed the border to non-citizens and residents on March 16. Subsequently, the country banned gathering groups of more than two people on March 22 when the number of confirmed cases had risen to more than 23,900 with more than 90 deaths (Bennhold & Eddy 2020) to stem the spread of the coronavirus. The values of the abnormal returns remain statistically insignificant about 29 working days after the event due to the delayed response by the government. Nevertheless, after this period, excess returns are statistically significant advocate the detrimental impact of coronavirus-induced lockdown on the profit of the stock market. Similarly, cumulative abnormal returns are insignificant for 29 working days and become significant with high cumulative loss (about 23%).

France confirmed the first case of the virus on January 24, 2020 (Jocard 2020). Later, on March 9, it was banned on the gathering of 1,000 people (Lahut 2020), on March 13, it closed schools (Kar-Gupta, & Lowe (2020), and on March 16 it shut borders (Meilhan 2020). Just like Germany, France also responded very late and imposed a lockdown in the second week of March, about one and a half months after the first confirmed case. So, abnormal returns, calculated from the French CAC 40 index, remain insignificant for about 31 working days, and then, several values are become statistically significant to portray the substantial effect of the pandemic. Similarly, cumulative abnormal returns are highly significant with a large negative magnitude around 33 working days after the event. Cepoi (2020) also found the volatility in German and French stock markets owing to the COVID-19.

Argentina reported the first infected case on March 3, 2020 (Galinsk 2020). The government responded relatively earlier and announced a countrywide lockdown on March 19 (Rosario, & Gillespie 2020). Due to early lockdown, the abnormal returns of the Merval Index, a leading index of Argentina, are statistically significant during the first two weeks. Moreover, cumulative abnormal returns are also significant right after the event.

DISCUSSION

Table 6 is depicting the summary of stock markets' returns in the form of the time from the first confirmed case to partial/complete lockdown. Moreover, it can be noted that the difference between the date of the first confirmed case and the lockdown was highest in America (57 days) due to the gap between the first imported case (22 Jan-20) and the first local reported case (26-Feb-20) and delayed in lockdown, followed by Germany (55 days) due to the delayed response by the government, India (54 days) due to imposition of lockdown in about five phases (Bansal & Hasin 2020) and Russia (54 days) due to delayed in lockdown. The values of abnormal returns and cumulative abnormal returns become statistically significant in the first week after the confirmation of the first case in many countries like Brazil, South Africa, Peru, Mexico, Chile, Saudi Arabia, Colombia, Bangladesh, and Argentina that advocate the influence of the COVID-19 on the stock markets. Furthermore, the other countries' values of AR and CAR are also statistically significant after imposing restrictions on economic activities. Therefore, in all the selected countries COVID-19 has adversely influenced stock market returns, and the results are supported by (Alfaro et al. 2020; Kim et al. 2020; Liu et al. 2020; Mazur et al. 2021; Ramelli & Wagner 2020; Zhang et al. 2020) that analyzed the impact of COVID-19 on stock markets. Besides that the results of the event study methodology also advocate the black swan effect as coronavirus epidemic was utterly unpredictable and severely affected the global economy (Buy and Falcon 2014; Taleb, 2007) and identified by Antipova (2020).

Cont.... TABLE 4. Abnormal Returns of the 20 Countries

Days	USA	BRZ	IND	RUS	SOA	PER	MEX	CHL	SPN	UK	IRN	PAK	SAA	ITL	TUK	COL	BAN	GER	FRA	ARG
22	-1.8045	-2.4941	0.6187	0.0578	1.7433	0.6791	-1.0893	1.7872	0.4687	0.4025	-2.2392	-0.2039	0.4420	0.1692	0.2760	0.8878	0.2833	-0.1125	-0.8858	-0.4378
23	-1.2702	0.6770	-0.2429	-0.2183	1.0777	0.4482	-0.1221	1.4547	-1.1344	0.6164	0.1542	1.7627	1.1925	0.2435	-0.0441	0.2618	-0.0309	-1.4671	0.0009	2.0274
24	0.1075	-0.9860	0.0279	-1.5693	-0.8093	1.4507	-0.6626	0.9380	-1.5790	-0.7164	5.9359	0.3346	0.0327	-0.8794	0.9470	0.6288	0.2093	-1.7681	-1.5044	1.2467
25	-2.2770	-1.2718	-1.1325	-3.7178	1.0816	0.2715	1.6907	-0.3570	-3.6171	-1.6110	0.3327	1.7697	0.7104	-1.5389	-1.2157	-0.2416	0.1734	-0.1783	-1.5292	2.6975
26	0.0460	0.7472	-2.2215	-0.1498	1.7070	-0.0081	0.1911	0.6308	-1.4291	-3.4824	3.3775	1.0975	0.8037	-4.9729	0.1667	-0.0411	0.0520	0.4051	0.1565	1.7108
27	2.0016	-1.6971	-0.0127	-3.7992	-1.3200	-0.0151	0.0608	0.7867	-0.1600	-0.0490	-2.5453	-1.5266	0.0969	-1.5023	0.8510	-0.3674	-0.0189	0.4531	0.4467	-2.8572
28	-1.4927	2.7109	-3.8055	0.5214	-0.0093	0.1573	0.0663	0.4897	-6.5937	-0.6230	3.0272	0.8463	0.0594	0.0597	0.3260	-0.4451	-0.0689	-0.7197	0.5374	-0.3526
29	1.6735	1.2863	1.5809	-0.9821	0.8547	0.4083	0.1748	0.7499	1.5789	-5.0085	-0.4470	-0.4340	-0.8632	-7.8136	-0.5979	-1.8041	0.0984	-1.5495	-0.8690	0.8671
30	-1.4519	1.2372	-3.4800	-0.8596	-0.2260	-0.9421	-1.1197	-0.6569	-3.5782	1.0450	-2.8030	1.1272	-0.3723	2.8747	0.2333	0.0691	0.0725	-3.6541	-1.8729	-0.4978
31	-0.7969	-0.5570	-1.1431	-2.2897	-1.0261	0.3098	-0.1140	-0.5210	2.6835	-1.7848	1.4655	0.1959	0.4617	-2.7495	0.2478	0.7344	0.0611	-0.6750	-3.8423	0.3832
32	-3.1540	0.6072	-2.5243	3.1846	0.5180	-0.0442	1.2556	0.2669	-1.5350	1.1873	-0.8000	-1.4482	-0.3703	0.8072	1.0778	-1.1114	0.1164	-0.2124	-0.6991	-0.3217
33	2.1750	0.5591	-1.1076	1.0098	1.3785	-0.4523	-0.3252	-0.7468	0.8159	-1.8031	5.3920	0.1942	-1.1591	-0.5444	-0.2523	-0.2286	0.0660	-5.7291	-0.2839	-1.7036
34	-0.20254	-0.6279	2.4205	-1.5270	-0.0500	0.3654	-0.7343	-1.0486	0.3077	0.5943	-0.0995	-0.0435	0.3217	0.9378	0.3697	1.1324	0.0588	0.2756	-5.7248	0.9967
35	-4.3101	-0.5986	-6.0799	2.9820	0.4918	0.3428	0.4314	0.3752	-1.4743	0.3203	2.0364	0.0506	-0.4895	0.7602	-0.2194	0.0328	0.1023	-2.4271	0.7522	4.1735
36	4.0844	0.6196	1.0339	0.6108	0.6964	1.4347	0.0299	0.8901	3.2556	-1.6880	0.3762	1.9637	-0.6754	-0.5008	-0.9967	-0.1342	0.1676	0.9076	-2.6092	0.0867
37	-5.7305	-0.0428	2.7443	0.6108	-0.4373	-0.4356	0.4456	-0.7332	1.4178	3.7553	0.7049	0.8040	0.3147	3.4387	-0.0576	-1.4030	0.1166	-2.5458	1.1809	-0.6535
38	2.6356	0.8995	1.6160	-1.6225	-1.0244	-0.1522	0.4848	1.6027	0.5507	1.8810	0.3091	-1.4895	0.4357	0.6029	-0.0846	-0.2303	0.1933	0.8000	-2.6938	-0.5451
39	-1.8551	-0.5823	0.0528	0.5349	-0.0287	0.5380	1.0671	1.0763	-1.6194	0.9543	-0.6418	-0.0151	1.5271	0.3696	-0.0877	-0.3391	0.2478	1.5181	1.1126	1.4564
40	0.5973	-2.4673	-1.9858	1.2820	0.7203	0.1706	1.2504	1.3202	-0.7764	-2.3513	1.1937	0.4436	-0.0525	-1.3086	-0.2566	0.9161	0.0220	-0.9827	2.0883	0.7147
41	-1.8729	1.6118	1.5881	-0.6580	0.1487	0.4240	-0.4651	-0.3321	0.7971	0.4102	0.9775	-0.1293	0.3778	0.0758	-0.0350	-0.1095	-0.0392	4.4634	-1.5034	2.0279
42	-0.0050	1.6403	-1.8146	1.2076	0.9135	0.9101	-0.1102	-1.3072	-1.3526	0.8279	-0.5808	-0.7265	0.6460	0.4738	0.7909	-0.2300	0.2842	0.7112	3.4624	0.3315
43	3.1807	0.9483	-0.9454	0.4017	-0.6395	-0.3910	0.3010	0.8438	-0.0486	-1.7059	-2.4941	0.2493	0.8026	-1.2325	0.2247	-0.5741	0.1914	0.4942	1.8624	2.7156
44	-0.5702	-1.4475	3.6067	0.7977	0.1615	0.6377	0.4454	0.5400	0.0359	0.1951	2.8480	0.7298	-3.3287	0.6885	-0.4325	-1.3660	0.4246	-1.6897	1.0406	0.5462
45	2.3337	-0.9213	-0.2567	0.1564	-0.0817	-0.9558	-0.2195	0.4489	1.6861	-0.5246	0.0769	1.1598	0.0850	-1.1482	0.2395	-0.1133	0.4480	0.7598	-1.9123	-1.5277
46	-1.8154	0.2930	1.7248	0.5350	-0.9052	-0.0336	0.9789	-1.9431	0.9757	1.3095	1.5569	-0.3195	0.7643	1.5420	0.9420	0.0747	0.5230	0.4677	0.2325	1.4878
47	1.6041	-0.2562	-0.6079	0.4674	0.4915	0.1959	0.0181	-0.0023	-0.3261	0.9307	0.6614	0.0268	-0.3434	0.8671	0.0627	1.1995	-0.1702	-1.8035	0.1380	0.1088
48	-0.5010	-0.5555	-0.3738	-0.4304	1.6289	1.3949	-0.1868	-0.8147	0.7223	-0.2126	-0.9067	-0.4099	-0.1572	-0.0372	0.1969	-0.6064	0.0061	0.0590	-1.9435	0.9085
49	-1.9412	1.1431	0.2857	-0.8465	0.4779	-0.5918	-1.2478	-1.4651	0.2191	1.2349	3.2715	-0.6200	0.3714	0.5513	0.1470	0.2003	0.1031	-0.2644	0.1051	-1.0499
50	0.7747	-0.6867	1.2617	0.0049	0.1724	-0.0812	-0.3514	0.5118	-1.6896	-0.3921	0.4554	-0.1181	-0.4995	-0.1115	0.7942	-0.2391	-0.1298	2.3757	-0.7247	0.3902
51	-0.6994	-0.6933	-0.0645	-2.2945	-1.0294	0.0055	-0.4787	-0.1615	-0.4996	-1.4858	-1.5453	-0.0495	0.5425	-2.0448	0.1563	-0.3336	-0.3160	1.1374	1.9214	1.6188
52	2.9981	-0.0888	-1.3767	0.2348	-0.7289	-0.1941	1.7043	1.7308	0.7022	0.2295	1.2662	0.3440	0.2552	0.0986	0.0547	0.6284	0.3269	-0.1594	0.8747	-0.5200
53	-0.2575	0.6530	0.9426	0.2983	-0.0624	0.1591	-1.4798	-0.3138	-0.2944	1.1976	1.2772	0.0457	-0.0109	0.6875	0.7011	0.6406	0.3051	0.9042	0.0075	0.0324
54	0.8783	-0.8399	0.5528	-0.1988	0.4279	0.2562	0.2079	0.3629	-1.2818	0.1850	0.7898	0.0734	0.7075	0.0441	0.3237	-0.1027	0.0645	0.4790	0.5858	-0.7410
55	-0.0359	1.9575	-0.7917	-0.7017	-0.1684	0.6831	-0.5570	-0.2944	0.5386	-1.3116	1.2401	0.1900	0.6261	-1.4821	0.3940	0.4217	0.1550	-1.7856	0.1278	-1.6523
56	0.4105	-0.2756	0.5610	1.4212	0.7886	0.1590	0.2809	0.3948	0.1586	0.9778	1.3160	-0.3310	0.7841	0.6958	0.1575	0.8434	-0.0145	0.0324	-1.7016	-1.3840
57	1.7506	0.2761	0.4174	0.3923	-0.8142	-0.5292	0.0673	-0.1328	-0.8757	0.4106	0.9737	0.3814	0.0512	0.5276	0.1803	0.0380	0.0240	1.2864	-0.0718	2.3759
58	-0.5869	0.8694	0.7496	-0.6734	0.3898	0.4665	0.4597	0.4830	0.7537	-0.5667	-1.0104	-0.3585	0.0196	-0.3873	-0.1637	1.5526	0.0702	0.1449	1.4249	2.0684
59	0.7471	-0.4821	1.3301	0.1060	1.2607	0.1189	0.8204	-1.2291	0.6560	0.6994	-0.9088	-0.1938	1.0054	1.1985	-0.1705	0.2286	0.0702	-1.8282	0.2455	1.7653
60	0.2849	1.7734	-2.6109	0.6483	0.8869	1.5330	-0.4432	-0.0534	1.3576	0.8133	1.0103	-0.2521	0.4705	0.6554	0.2036	1.4517	0.0702	0.6348	-1.7065	-0.2464

Source: Author's own work. Note: Bold, bold-italic, and bold-italic-underline values represent 10%, 5%, and 1% level of significance, respectively.

TABLE 6. Summary of the Results

	Total Cases on 14th Aug 2020	Proportion of the Country in COVID-19 Cases	First Case (2020)	Initial/Partial Lockdown (2020)	Curfew/Complete Lockdown (2020)	Difference B/W First Case & Lockdown	AR Significant	CAR Significant
America	5,431,381	30.94%	22-Jan	19-Mar	19-Mar	57	25	35
Brazil	3,229,621	18.40%	25-Feb	21-Mar	01-Apr	25	0	11
India	2,506,247	14.28%	31-Jan	25-Mar	25-Mar	54	26	28
Russia	912,823	5.20%	31-Jan	17-Mar	25-Mar	54	19	25
South Africa	572,865	3.26%	05-Mar	18-Mar	27-Mar	22	2	5
Peru	507,996	2.89%	06-Mar	16-Mar	16-Mar	10	1	4
Mexico	505,775	2.88%	28-Feb	18-Mar	23-Mar	24	6	9
Chile	380,034	2.17%	03-Mar	22-Mar	13-May	19	7	7
Spain	358,843	2.04%	31-Jan	10-Mar	14-Mar	43	25	28
UK	313,798	1.79%	31-Jan	24-Mar	24-Mar	53	26	28
Iran	338,825	1.93%	16-Feb	22-Feb	19-Mar	32	13	10
Pakistan	287,300	1.64%	26-Feb	13-Mar	21-Mar	24	11	13
Saudi Arabia	295,902	1.69%	02-Mar	12-Mar	24-Mar	22	4	4
Italy	252,809	1.44%	31-Jan	11-Mar	24-Mar	53	16	27
Turkey	245,635	1.40%	11-Mar	13-Mar	27-Mar	16	-9	-1
Colombia	433,805	2.47%	06-Mar	16-Mar	16-Mar	10	1	4
Bangladesh	271,881	1.55%	06-Mar	25-Mar	25-Mar	19	4	9
Germany	222,487	1.27%	27-Jan	16-Mar	22-Mar	55	30	30
France	209,365	1.19%	24-Jan	19-Mar	16-Mar	52	31	34
Argentina	276,072	1.57%	03-Mar	19-Mar	19-Mar	16	4	4

Source: *Author's own work.*

CONCLUSION

The novel coronavirus has been transmitted throughout the world and has become a health crisis and a financial crisis due to severe worldwide lockdown. There were 21,175,959 confirmed cases of COVID-19, including 759,395 deaths, reported by WHO on August 14, 2020. The present research has investigated the impact of COVID-19 on stock market returns in the USA, Brazil, India, Russia, South Africa, Peru, Mexico, Chile, Spain, United Kingdom, Iran, Pakistan, Saudi Arabia, Italy, Turkey, Colombia, Bangladesh, Germany, France, and Argentina. For this study, the data of closed prices of major stock indices of the selected countries from July 2019 to July 2020 has been taken. For descriptive analysis, the study has calculated correlation among the selected countries' stock indices. Similarly, for empirical analysis, the study has employed the event study methodology to calculate the abnormal returns, average abnormal returns, and cumulative abnormal returns with a 100-day estimation window and 91 days (-30 to 60 days) event windows.

The descriptive statistics indicate that the sums of the returns of the major indices of India, South Africa, Peru, Mexico, Chile, Spain, United Kingdom, Saudi Arabia, Italy, Colombia, Bangladesh, and France were non-positive for the given period with the lowest cumulative returns in Colombia (-14.7%) followed by Bangladesh (-11.5) which revealed that these countries faced massive loss during the pandemic period. Similarly, correlation metrics depicted a positive correlation among almost all the given indices' price revealing that COVID-19 has affected all the countries' stock markets in the same way. The empirical results of ESM showed negative and significant values of abnormal returns, average abnormal returns, and cumulative abnormal returns, which clearly expressed that the epidemic did not only adversely affects the returns of the stock markets, but also raised the volatility of share prices. Moreover, the strict lockdown of cities, the closure of borders, the implementation of social distancing rules, the collapse in oil prices, the closure of all business activities, and other health interventions have exacerbated the uncertainty of the situation in all the world's stock markets. The outcomes of the study supported the findings of (Alfaro et al. 2020; Antipova 2020; Kim et al. 2020; Liu et al. 2020; Mazur et al. 2021; Ramelli & Wagner 2020; Zhang et al. 2020) who have also found significant relationship between COVID-19 and stock returns in various countries.

This study contributes to the understanding of stock behavior, as it examines the unforeseen adverse epidemic impacts of a fear-inducing infection on financial markets. From the perspective of an investor, the findings of this study highlight the importance of not only the business aspects of the stock markets, but also of the investments' risk created by such a sudden event. Furthermore, the investigation has significant implications for the relevant stakeholders and policy makers. The governments and stock exchange authorities should rationalize the

financial policies by providing soft loans and related subsidies to the specific sectors severely impaired by the epidemic. Moreover, as Covid-19 is a global pandemic, so countries should work together to contain the impact of such unprecedented events on stock markets. Individual policy by each country may cause further challenging situations for the global financial market. In view of the practicality of the above findings, the analysis suggests that the results will be useful for corporations and individuals, investment managers, financial experts, industrial analysts, and healthcare professionals to effectively communicate the danger of a contagious disease. Apart from that, it is also useful to digitize companies and other similar operations to contain such a type of black swan incident that adversely affects the economies and damages the health system around the world. It is also suggested that global financial institutions consider certain investment instruments that can absorb such pandemics.

This work provides a preliminary evaluation of the pandemic issue; there is considerable scope for further research on confidence in investors and foreign markets. The investigation could be seen as the framework for future investor sentiment and studies of uncertainty. Besides that there is a further scope to analyze the relative severity of the other global crisis such as financial crisis 2008, etc. In addition, the analysis can be expanded by adjusting the size of the data, taking different estimations and event windows, and applying parametric and non-parametric tests.

NOTES

1. <https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-similarities-and-differences-covid-19-and-influenza#:~:text=Mortality%20for%20COVID%2D19,quality%20of%20health%20care.>
2. According to Buy and Falcon (2014), if a distribution is negatively skewed, meaning there are more extreme negative returns than positive returns, the portfolio is expected to have periodic small gains, however a few extreme losses that wipe out any previous gains. Moreover, Taleb (2007) documented that “a black swan” is unknown, unpredictable, extreme rare event severely affects and catastrophically damages to an economy (Antipova 2020).
3. <https://www.worldometers.info/coronavirus/#countries>

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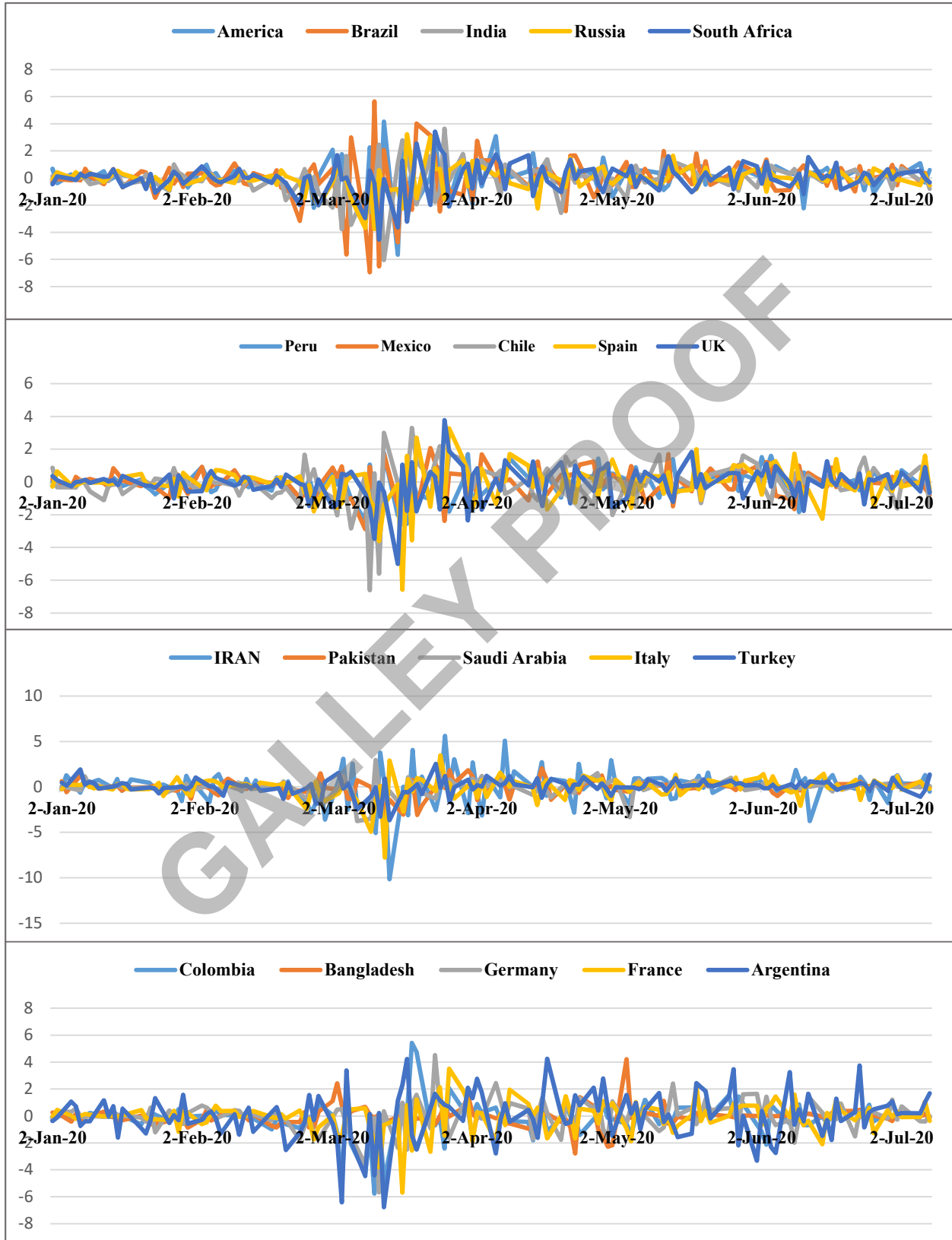
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APPENDIX A
Tables of Normal Returns of All Countries



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