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Impact of COVID-19 Pandemic on Stock Market Returns

Tek Bahadur Madai
Department of Management, Kailali Multiple Campus, Dhangadhi
Far Western University, Nepal

Corresponding Author: *Tek Bahadur Madai*; Email: tekmadai2068sm@gmail.com
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Abstract

This study examines how COVID-19 epidemic has affected stock returns. A causal-comparative design of quantitative research is used to examine how daily COVID-19 infection and fatality cases affect stock market performance. The analysis found that changes in the daily rate of new infections have had a substantial influence on overall equities returns as well as cross-over stock markets. In contrast, it was found that COVID-19 related deaths had a negative but often insignificant effect. The categorical variable magnitude of the influence on the equity market was determined to be relatively little. With the use of a time series graph and a regression model, the empirical data was examined. The time frame for the study was 100 days from the discovery of COVID-19 cases in the tested countries in 30 countries. The results of this study may be useful to policymakers and stock market investors. Recognizing the limitations of the data utilized in this study, more research can be done using a larger sample size and more sophisticated technique. Additionally, utilizing primary data, a behavioural research of investors' reactions to market reactions throughout the pandemic era may be carried out.

Keywords: Daily death cases, daily infected cases, markets size, share price movement

Introduction

Various pandemics had in the past spread rapidly, killed enormous numbers of people, and disrupted the global economy. End of December 2019 saw the discovery in China of an unidentified sickness with flu-like symptoms. It is the first lethal epidemic to hit the entire world in more than a century. The China Country Office of WHO announced about the instances of an unidentified disease found in Wuhan City

located in China's Hubei Province, on December 31, 2019. The unidentified sickness spread quickly; China reported 44 case-patients to WHO between December 31, 2019, and January 3, 2020. The National Health Commission of China sent WHO more thorough information on January 12, 2020, showing that the epidemic is related to exposure at a particular seafood market in Wuhan City.

A novel coronavirus identified by Chinese officials was discovered on January 7, 2020 (WHO, Situational Report No. 1, January 21, 2020). The disease was given the COVID-19 moniker, which stands for "coronavirus disease 2019," on February 11, 2020 (WHO, situational report 22; February 11, 2020). First, COVID-19 was an outbreak that started in China at the end of 2019 and expanded quickly until March 2020, when it resulted in a significant number of illnesses and fatalities.

More than 27.28 million individuals have been identified as having the disease as of September 7, 2020; 0.8876 million of these patients have died as a result of the illness, while more than 19.37 million people have been recovered globally; these figures are fast rising. There have been significant interruptions to people's personal life, including lockdowns for a large number of people. Beyond the apparent horrors of illness and death, fear has also had an untold number of indirect effects on individuals all around the world. The economic and financial effects of the corona virus may appear insignificant in comparison to the significant effects it has had on public physical and mental health.

This study observed the impact of COVID-19 pandemic on the stock market of the world. Stock market has been holding immense attention of the academicians, investors and policy makers because it replicates the economic status of the nation. Stock is a portion of the capital, which provides ownership of a firm. The investors invest in the stocks with expectation of returns which is only possible in the price rise of the stocks invested. The stock return depends upon the firm-specific and macroeconomic variables. Stock markets provide indices from which one can know about market situation in brief and its volatility indicates the price movement of stocks in the market.

The price volatility of the stock is highly affected by change in micro and macro- economic variables. Stock market returns affected the major events occurring in the particular nation or in the world. Events occurring on time being have positive or negative impact on stock markets (Fama et al., 1969). Past studies have recognized a number of key events that have affected equity returns, for example, disasters (Kowalewski & Spiewanowski, 2020), sports (Buhagiar et al., 2020), news (Li, 2018), environmental (Alsaifi et al., 2020), and political events (Beauleu et at., 2006). This study examined the effect of a more recent pandemic disease on stock

market returns, specifically the effect of the COVID-19 contagious infectious disease on the world. This newly outbreak disease has affected a large number of people as well as economy of the world. Economic activities are almost stopped, and priority has given to prevent the human beings from infection and cueing the infected people. The return on stock market investment depends upon the performance of the related firm, but when firms are affected by the pandemic and it will reduce the profitability and dividend payment ability and that leads to drop the stock price in the stock market.

The assumption of efficient market hypothesis prevails that investors are rational, and they take their own investment decision on the basis of market information. Event study introduced by Fama et at. (1969) provided useful evidence on how stock prices respond to information. The event (COVID-19) has spread all over the world and its reaction has been seen in the stock market. Gormsen and Koijen (2020) mentioned in their study that stock markets in the European Union and the United States decreased by as much as 30 percent between mid-February and mid-March. S & P BSE Sensex (one of the biggest stock markets of Asia region) which was 42273 points on 20 January 2020 decreased to 29894 points on 08 April 2020.

The stock market's dramatic decline following the COVID-19 outbreak shows that the pandemic has an effect on the market and that investors are reacting to this new development with knowledge. According to Kaplanski and Levy (2010), anxiety may have an impact on investment decisions because it makes people more pessimistic about future returns and less willing to accept risks. An unpleasant sensation brought on by anxiety might influence investing choices and the ensuing returns on assets. The peculiar circumstance created by COVID-19 has created fresh study opportunities.

The influence of the COVID-19 pandemic on stock market returns as determined by the top stock indices of the tested nations and their significant stock markets has been the main subject of this study.

Even in comparison to the Great Financial Crisis of 2007–2008, COVID-19 has shaken the world significantly. However, the effects of COVID-19 on the financial markets have opened up new avenues for study. There haven't been many research studies done in this area because it's a new problem. A number of monetary international organizations and platforms have warned that the recent COVID-19 will have a significant impact on the world economy, maybe even surpassing the impacts of the world economic crisis of 2007 and 2008. World Economic Forum (2020) insisted that globally the coronavirus fright is cruel, compared to the financial crisis in 2007-08.

Abdullah et al. (2020) investigated the significant effect of Coronavirus on stock market return and the study was conducted only taking the stock market of China. In other studies, Liu et al. (2020), Ramelli and Wagner (2020), Sansa (2020), Ding et al. (2020), and Ruiz et al. (2020) found the significant impact of COVID-19 on stock market return. All these references show that COVID-19 is having a significant impact on financial markets around the world. Indicators of the impact of COVID-19 on stock markets are being observed in various financial markets around the world, with the Dow and S&P being the focus in the US. The World Economic Forum (2020) said the Dow and S&P (American stock markets) experienced their biggest daily declines since 1987.

Research conducted to date on the effect of Coronavirus on share market return has focused on only a limited number of stock markets and countries. As such, this study took a large sample of the global stock market based on market capitalization. The effect of Corona has also been studied on a market capitalization basis (i.e. large, mid and small cap), and these efforts provide new insight into the impact of Corona on equity size based markets.

The main objective of this study was to investigate the effect of COVID-19 on stock market returns using data from international stock markets. The following research questions were addressed in order to achieve this objective:

1. How do daily cases of COVID-19 affect stock market returns?
2. How do daily COVID-19 fatality instances affect stock market returns?
3. Does the COVID-19 have a substantial impact on the size of the stock market and stock return?
4. What was the market trend both before and after the COVID-19 outbreak?

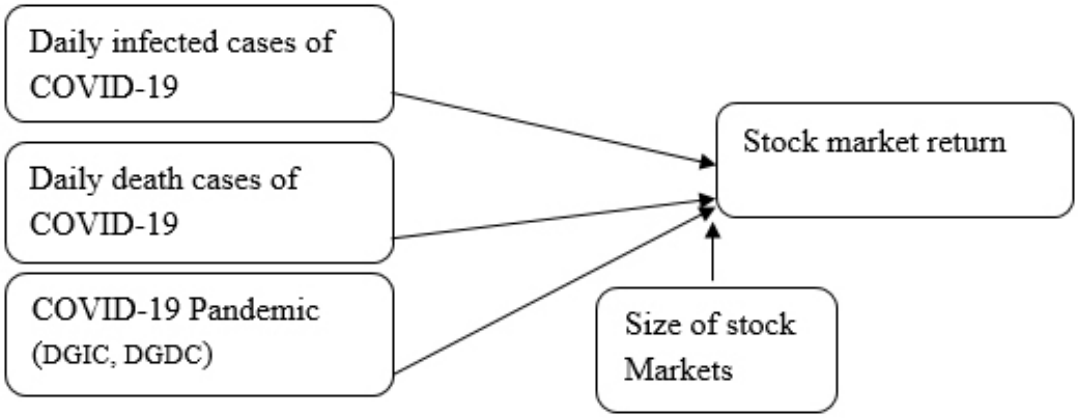
Literature Review

The stock markets have been affected by different events occurring in macro and micro environment of the economy. General assumption about market is that the investors react after getting market information either through additional investment or by withdrawn. The reaction of investors depends upon the good or bad news they received. Same news may be good or bad for investors. If the news is good, the investor makes additional investment in stock market and this leads to increase the market prices. On the other hand, if the news is bad, the investor wants to withdraw the investment made. In this situation, supply of stock rises in the market and stock prices decrease. Hence, the stock market is adjusted through the demand and supply of stocks. The present outbreak pandemic is an event and its impact must be in stock market.

The COVID-19 has badly affected the human-beings in the world, so impact in the stock market must be negative. In this study, there are three variables under study. Stock market return (SR) is a dependent variable and daily growth of infected cases (DGIC) and daily growth of death cases (DGDC) due to COVID-19 are independent variables. The causal relationship between the dependent and independent variables can be shown as follows:

Figure 1

Conceptual Framework



Daily occurrences of COVID-19 infection and daily cases of COVID-19 mortality have been treated as independent variables in the above figure. The return on stocks has been seen as a dependent variable. Market capitalization has been used as a categorical variable to investigate the impact of stock market size. Daily infections with COVID-19 and fatal instances have been reported. Since just operational days' worth of stock prices were accessible, this study used the assumption that investors made investment decisions based on the information that was available the previous operating day.

Empirical Studies

Some empirical studies have been reviewed related to impact of COVID-19 on financial market. There were so many studies conducted on the impact of the COVID-19 on stock market returns. Wang (2013) conducted research to analyze impact of global financial crisis of 2007-2009 on East Asian stock markets. The research also looked at how interdependencies among the six major East Asian stock markets changed throughout the course of the global financial crisis from 2007 to 2009. The study evaluated their relationships with the USA before and throughout the global financial crisis of 2007–2009. This study found that the crisis has strengthened the linkages among stock markets in East Asia. The analysis demonstrates that the

East Asian stock markets were less sensitive to the shocks in the USA following the crisis.

A study by Liu et al. (2020) looked at the short-term effects of the Corona Virus on the stock market indexes of the afflicted nations in Asia, America, and Europe. The event study and panel fixed effect regression analysis methods were used to obtain the results, which show that the stock markets in the key impacted nations and regions saw a sharp decline following the viral epidemic. Asia-Pacific nations have greater negative anomalous returns than other regions.

Al-Awadhi et al. (2020) conducted research to examine COVID-19's impact on stock market returns. This investigation examined the potential influence of contagious infectious diseases on stock market performance. The impact has been investigated using panel data analysis. The study's findings show that the daily increase in the total number of confirmed cases and the number of COVID-19 related fatalities significantly lowered stock returns for all types of companies.

Sansa (2020) examined the impact of the corona virus on the security markets of USA and China by collecting samples from March 1 through March 25, 2020. By using the basic regression model, the researcher discovered that COVID-19 had a large influence on the stock market of the studied nation.

Shapkota (2020) investigated how epidemic infectious diseases and fatalities affected stock returns. The new instances of the coronavirus that have been detected have had a significant influence on the financial markets, according to the causal-comparative study addressing the impact of the pandemic COVID-19 on stock return. In contrast, COVID-19 mortality was shown to have a detrimental but largely minor impact. The categorical variables geographic region, restrictions, and country-specific impact were all found to have relatively low values. This data covers daily COVID-19 infection and mortality cases from 20 January to 30 May. China, India, Israel, Japan, Korea Republic, Malaysia, Saudi Arabia, and the United Arab Emirates were the eight countries from which the sample was drawn.

All previous empirical studies have used smaller samples than those used in this study. Thus, the conclusions of this study are based on results from a large sample. This research evaluates the impact of the COVID-19 pandemic on stock market performance. Similarly, this study has also looked into COVID-19's effect depending on the size of stock markets. Compared to other relevant research, these two things are distinctive. Studies on the effect of COVID-19 on equity market returns have been undertaken by Wang (2013), Al-Awadhi et al. (2020), and Papadamou et al. (2020). However, only a small number of stock markets were included in each of the study's samples.

Methods and Procedures

This study employed the quantitative research approach with descriptive and causal-comparative research design. Since the objective of this study was to determine how COVID-19 affected stock market returns, the causal link between daily coronavirus infections and deaths and stock market returns was investigated. The necessary information was gathered from the World Health Organization's (WHO) official website, https://www.worldometers.info/coronavirus, the World Bank's official website, https://data.worldbank.org, and http://inesting.com, a dependable source of stock market information.

The judgmental sampling approach was used to choose the nations and stock exchanges. The countries and stock markets under study were chosen on the basis of their market capitalization. The target population of the study was 213 COVID-19 affected countries till June 30, 2020 (WHO, situational report-137) but the stock markets indices of all these countries could not be available due to a lack of sophisticatedly developed stock markets, and some markets remained closed due to the lockdown done by the perspective government. Hence, only 94 countries were available to get the required data. Therefore, 94 countries of the world were the populations of the study, and among them, 30 countries were selected on the basis of the size of stock markets.

For the selection of the countries, they were classified into three clusters on the basis of their market capitalization (i.e. large size, medium size, and small size) with ten countries from each group on the basis of decile (top ten, middle ten, and lower ten). The stock markets of the 30 sampled countries were chosen for the study of stock market returns. Stock market indices of four months before and six months after the COVID-19 outbreak were chosen to observe the trend of stock market indices and 100 days daily confirm cases and death cases were taken from 30 selected countries when the COVID-19 first case was identified in the particular country. Sampled countries, stock markets, and market capitalization have been given in table 1.

Table 1

Selected Countries, Market Capitalization and Stock Markets under Studies

S.N.	Country	Market Cap. (In Billion)	Abbreviation	Market Cap. (In billions)
Large Size Markets				
1	United States	41000	NYSE composite	22,923
2	Japan	6191	Nikkei225	5670

3	China	8516	SSE	5010
4	United Kingdom	4590	FTSE All Shares	4590
5	Australia	4702	AORD	4,026
6	Saudi Arabia	2407	TASI	2365
7	France	2366	CAC40(FCHI)	2,095
8	India	2180	BSE Sensex30	2,056
9	Germany	2098	DGAXI	2098
10	Canada	1938	GSPTSE	1938
Medium Size Markets				
1	Pakistan	92	KSE	92
2	Bahrain	77	BAX	77
3	Bangladesh	77	DSEX	77
4	Morocco	65	MASI	65
5	Portugal	62	PSI20	62
6	Egypt	44	RGX30	44
7	Nigeria	44	NSE30	44
8	Czech Republic	41	PX	41
9	Argentina	39	MERV	39
10	Hungary	33	BUX	33
Small Size Markets				
1	Lebanon	8	BLOM Stocks	8
2	Malta	5	MSE	5
3	Ukraine	4	PFIS	4
4	Cyprus	4	Cyprus Main Stocks	4
5	Venezuela	4	IBVC	4
6	Zambia	3	LSE All Shares	3
7	Botswana	3	DCIBT	3
8	Zimbabwe	2	INDZI	2
9	Costa Rica	2	IACR	2
10	Serbia	2	BELEX 15	2

Source: - https://data.worldbank.org.

Models

The panel regression method was used to look at how the epidemic affected stock returns. Al-Awadhi et al. (2020) used a panel regression technique to evaluate two measures, namely, daily cases of COVID-19 and daily mortality cases related to the infection. Hausman test was conducted to identify the model and the random effect model was appropriate for the study.

Time Series Plots

A time series plot is a series of numeric data points that plot observations against time. These are similar to x-y graphs, but x-y graphs can plot any type of x variable, while time series graphs can only plot time variables on the x-axis. These charts do not have categories such as pie charts and bar charts. These graphs show how data changes over time. This study used time series charts to observe the behaviour of stock indices before and after the COVID-19 eruption. SPSS statistics 20 version and Gretl software were used to draw the result and analysis of data.

Econometric model

$SR_{it} = \beta_0 + \beta_1 (DGIC)_{it} + \beta_2 (DGDC)_{it} + u_{it}$..... (I)

Where,

SR_{it}= Stock Return of i^{th} stock market at time t

$DGIC_{it}$ = Daily growth of infectious cases due to COVID-19 of i^{th} stock market at time t.

$DGDC_{it}$= Daily growth of death cases due to COVID-19 of i^{th} stock market at time

β = Slop

u_{it}=Error term

Models for Regression Using Categorical Dummies

$SR_{it} = \alpha_1 (\text{large dummy})_{1i} + \alpha_2 (\text{medium dummy})_{2i} + \alpha_3 (\text{small dummy})_{3i} + \beta_1 (DGIC)_{it} + \beta_2 (DGDC)_{it} + \varepsilon_{it}$ ……. (II)

Where, Large dummy = Dummy variable of large size stock markets and one for the large size markets and zero for others.

Medium dummy = Dummy variable of medium size stock markets and one for the medium size markets and zero for others.

Small dummy = Dummy variable of small size stock markets and one for the small size markets and zero for others.

These dummies have been created to inspect the impact of COVID-19 on equity markets according to the size of markets.

Results

The session presents the empirical results of the study. Data and result from the software have been presented in the forms of table, and graphs and analyzed to draw the conclusion of findings. The result of summary statistics, correlation matrix, panel regression, and time series plot are mentioned and analyzed to achieve the objective of the study.

Table 2

Summary Statistics of Variables under Study

Variables	Mean	Median	Minimum	Maximum	S.Dev.	Skewness	Kurtosis	N
DGIC	0.1103	0.0347	0.0000	15.0000	0.3884	22.9380	775.7080	3000
DGDC	0.0701	0.0000	0.0000	8.0000	0.2307	16.3670	484.2730	3000
SR	-0.0003	0.0000	-0.1559	0.1855	0.0226	-0.0360	11.6460	3000

Due to the patients' quick development, variations in the daily growth of infected and death cases from COVID-19 are more variable than stock returns, which have altered at a regular rate. The highest changes in infected cases and death cases were recorded at 15, or 1500%, and 8, or 800%, respectively. The largest measured change in the stock return was 0.1855 (18.55 percent). Due to the considerable volatility in daily COVID-19 infection cases and death cases in the studied nations, the daily rise of infection cases and death cases is positively skewed whereas the stock market return is negatively skewed. The fast spread of the illness has greatly distorted the statistics from DGIC and DGDC.

Table 3

Correlation between Variables

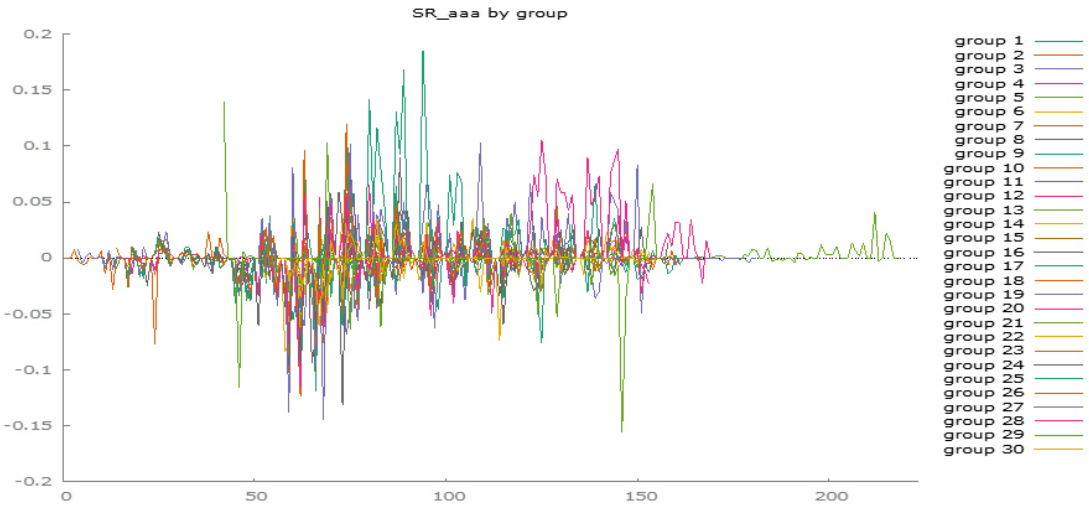
Variables	DGIC	DGDC	SR
DGIC	1	0.075**	-0.038*
DGDC		1	-0.009
SR			1

*The signs, **,* indicates significant at 10 and 5 percent level of significance (2-tailed).*

Table 3 displays the relationship between stock return, COVID-19 infection, and COVID-19 mortality cases. Stock return and COVID-19 infection and mortality cases have a poor and unfavorable correlation. The low correlation demonstrated a poor link between variables, while the negative correlation coefficient suggested an inverse relationship between the variables. The likelihood of multi-collinearity between independent variables is decreased by this evidence. The inverse association shows that stock market returns fall when COVID-19 infection and mortality rates rise, and vice versa. In terms of the stock market return, the variable DGIC has a greater coefficient than the variable DGDC. It suggests that the daily increase in infected cases has had a greater impact on stock market return than death cases.

Figure 2

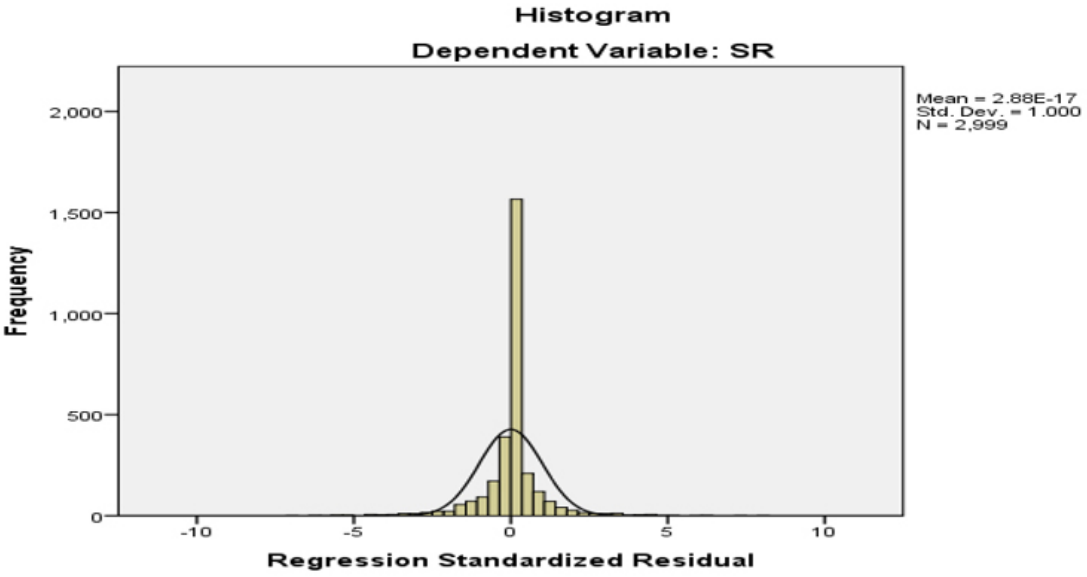
Panel Plot of Stock Return (dependent variable)



The dependent variable stock return's panel plot reveals that it was less volatile in the early and later periods and more volatile in the middle. When COVID-19 was discovered in the country under investigation, it was in the middle of the period. This data demonstrates that when coronavirus-positive cases were discovered in a particular country, the stock market return of that nation experienced significant volatility. These levels of volatility demonstrate how the epidemic has affected stock market results.

Figure 3

Normality of Residuals



The residuals' normality plot is shown in Figure 2. Except for a few outliers, the data were regularly distributed. The rise of infected patients was rapid in the beginning. The testing boundaries are what determine the new identification of COVID-19 instances. The likelihood of receiving fresh infected cases increase as the government widens the testing borders and vice versa. Consequently, it makes sense to have some outliers.

Table 4

Regression Results of Stock Return and Confirmed and Death Cases of COVID-19

Models(Random-effects)	Constant	DGIC	DGDC
Model:1	−5.595750	−0.002097	−0.000171
(Overall)	(0.9377)	(0.0477 **)	(0.9239)
Model:2	−6.715860	−0.002104	
(DGIC)	(0.9240)	(0.0464 **)	
Model:3	−0.000269		−0.000427
(DGDC)	(0.6993)		(0.8110)

*The signs *, **, and *** denote the results are significant at 10%, 5% and 1% level of significance respectively. The parenthesized values are p-value of z test.*

Note: This table demonstrates panel regression results of dependent and explanatory variables. Stock return is a dependent variable and changes in confirmed and death cases of COVID-19 are independent variables. The result is based on overall stock markets (data from 30 stock markets) using a random-effects model of panel regression.

Using Hausman Test, the random-effect model has been shown to have a better fit to the data than pooled OLS and fixed-effect models. The findings indicate that the modifications in daily situations have a significant and detrimental effect on stock return. This suggests that the stock return has dropped if the COVID-19 infected cases have increased. The effect of this illness on the economy might be the cause. All economic activity will have declined if the epidemic expanded widely, which leads to unemployment. Investment activities were impacted when the people's sources of income ceased. Demand and supply for stocks are impacted by an uncertain economic climate. As a result, there is a low demand for stocks and a big supply, which drives down stock prices and returns. Negative effects of COVID-19-related deaths have been noted. This means that stock return would decline as the number of deaths rose. The fact that the mortality rate from this sickness was discovered to be 3.4 percent, which is much lower than the recovery rate, may be the cause of the minimal impact that has been noticed. Furthermore, the likelihood of the coronavirus-infected patient recovering is quite high. The investors had therefore displayed their responses before the sickness rather than following its demise. However, the government has offered this disease's patients free medical care. So, with the support of the government and from different helping hands it is easy to survive of the people.

Table 5

Panel Regression Results on the Basis of Size of Stock Markets

Models[Random-effects]	Constant	DGIC	DGDC
Model:1	−0.000665	−0.004012	−0.005047
(Large size)	(0.4553)	(0.1867)	(0.0447 **)
Model:2	−0.001070	−0.000859	0.006930
(Medium size)	(0.1562)	(0.4660)	(0.0577 *)
Model:3	0.001609	−0.009181	0.013928
(Small size)	(0.3375)	(0.0047 ***)	(0.0012 ***)

The signs, **, and *** denote the results are significant at 10%, 5% and 1% level of significance respectively. The parenthesized values are p-value of z test.*

Note: The stock return is a dependent variable and changes in infected and death cases of COVID-19 are independent variables. The results are based on the size of stock markets (large, medium, and small) using a random-effects model of panel regression. The coefficient and p-value of independent variables have shown in the table.

Table 5 presents effect of pandemic as per size of stock markets. Indicating that the COVID-19 pandemic has affected stock markets of all sizes, but not equally, is the coefficient of DGIC, which is negative for all stock market sizes. This is because the small-size market's coefficient is higher than that of the other sizes. It indicates that the small-size markets have more impact than others. Evidence suggests that investors in large-cap stock markets are more reactive to death than infection, as these markets are more influenced by death cases than infected instances. The large-size stock markets are less affected by daily infection in comparison to medium and small-size stock markets.

Table 6

Panel Regression Results of Size Dummies

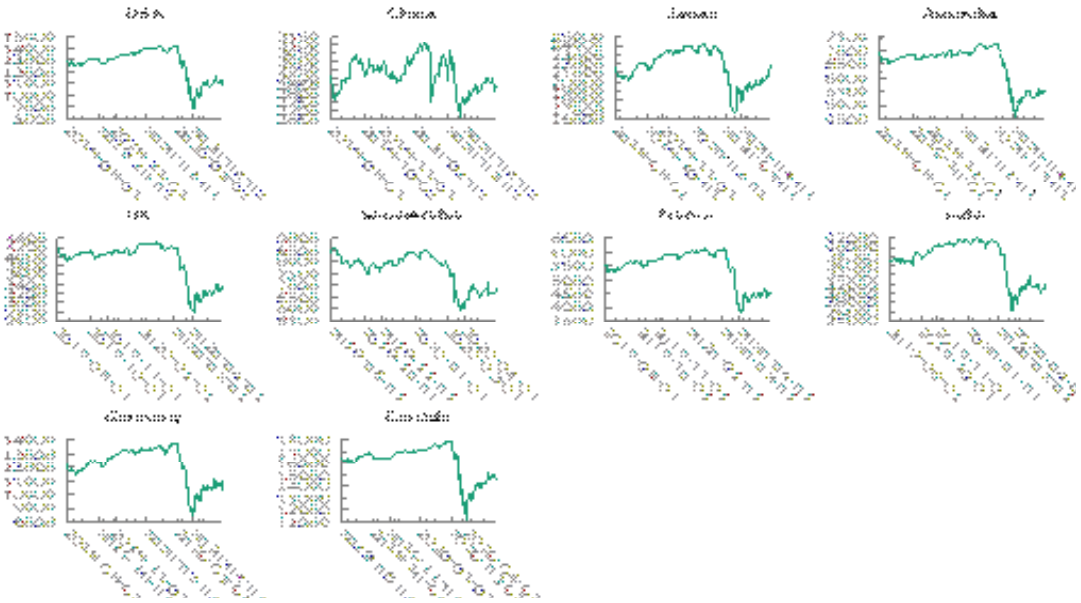
Models[Random-effects]	Coefficient	Z-values	P-value
Constant	−0.00041	−0.3339	0.7384
DGIC	−0.002035	−1.9200	0.0548 *
DGDC	3.527480	0.0196	0.9843
MCapDL(large cap. dummy)	−0.001011	−0.5840	0.5592
MCapDS(small cap. dummy)	0.002019	1.1650	0.2440

The signs, **, and *** denote the results are significant at 10%, 5% and 1% level of significance respectively. The parenthesized values are p-value of z test.*
Note: The regression results considering stock return as a dependent variable and confirmed and death cases of COVID-19 are independent variables with market capitalization size dummies.

The categorical variable size of stock markets has demonstrated a negligible influence on the stock return from COVID-19 infection cases and fatalities. According to this data, there is no difference between categorical variable stock market size as measured by market capitalization and the causal association between stock return and the COVID-19 pandemic sickness. This epidemic has had a major impact on every stock market in the world. The results of this study are in line with (Bowes, 2018), who asserts that economic uncertainty causes stock markets to be volatile. Because big stock markets are more advanced and established than medium stock markets, their coefficient is negative, indicating that they have less of an influence on COVID-19. Since the small-size market's coefficient is positive, the outcome demonstrates that tiny stock markets are more impacted than medium-sized markets.

Figure 4

Time Series Plot of Large Size Stock Market Indices before and after the COVID-19

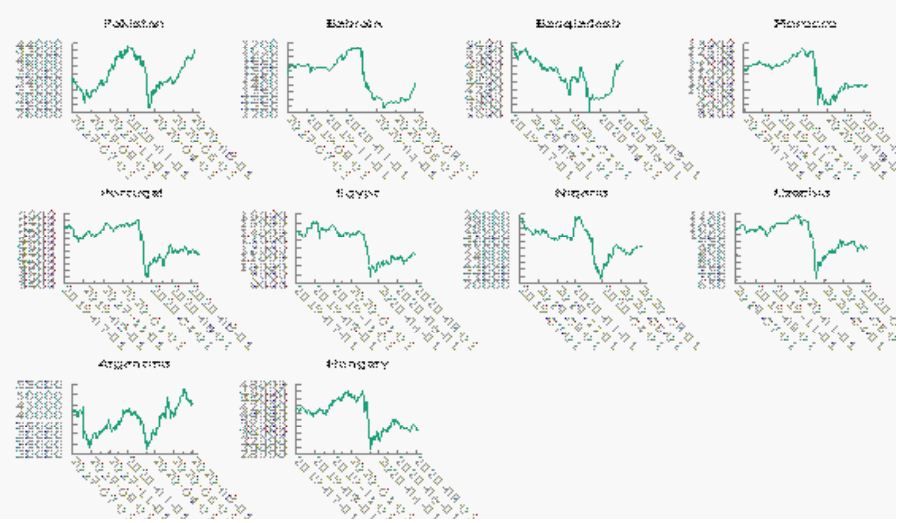


Note: This figure shows the time series plot of large size stock market indices before and after the COVID-19 cases identified in the particular countries. Objective of this figure is to observe the movement of large size stock markets before and after the COVID-19 outbreak.

Figure 4 depicts the movement of stock markets of large size capital like USA, China, Japan, Australia, UK, Saudi Arabia, France, India, Germany and Canada, before and after the COVID-19 outbreak. The COVID-19 was seen at the end of December 2019 in China and then after spillover in the other countries after January 2020. From the above figure it is clear that the stock markets of the under studies countries has been highly decreased after the COVID-19 infection identified in particular country. In the figure the stock market indices severely decreased after the months of March 2020 in every stock market. The stock market of China has more fluctuated than other countries. Hence, after analyzing above graphs it can be conclude that there has been great impact of COVID-19 on large size stock market returns.

Figure 5

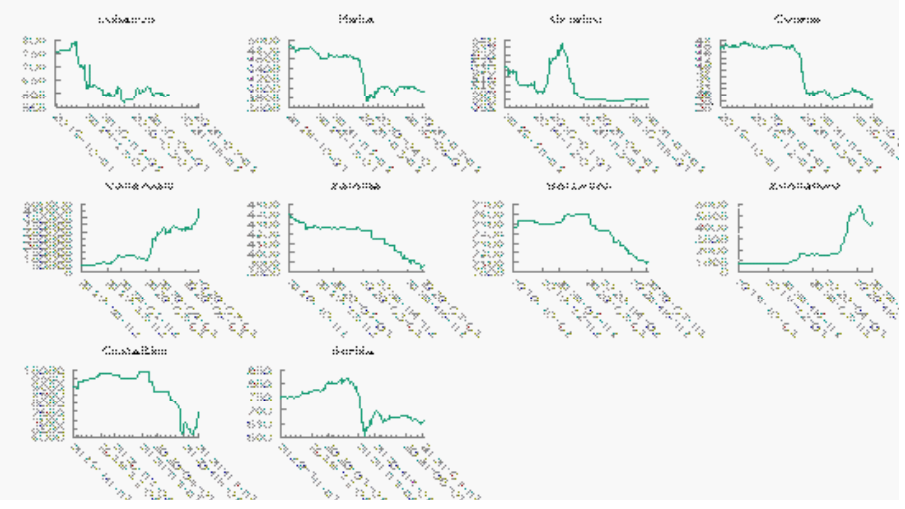
Time Series Plot of Indices of Medium Size Stock Markets before and after the COVID-19 Cases Identified in the Particular Countries



spread in these countries. All the stock markets trend line has rapidly declined after the corona virus infected cases conformed in the particular nation and shows slowly increasing thereafter. From this graph it is clear that there was severe influence of COVID-19 on these stock markets. The stocks markets were started to decline at the end of December because at that time the corona virus identified in China.

Figure 6

Time Series Plot of Indices of Small Size Stock Markets before and after the COVID-19 Cases Identified in the Particular Countries



Note: The objective of presenting this figure is to observe the trend of small size stock market indices before and after the COVID-19 pandemic outbreak.

Figure 6 shows the stock market movement of small size countries before and after the COVID-19 pandemic spread. The time series presentation of stock market indices of countries like Ukraine, Zambia, Botswana, and Costa Rica have been gradually declining trend because COVID-19 confirm cases in these countries were identified at the end of the first quarter of the year 2020. The stock market trend in Venezuela and Zimbabwe is increasing trend which shows there is no effect of coronavirus on stock markets. But some of the countries with small size market capitalization have been severely affected and their trend line suddenly declined after the coronavirus infection was identified.

Discussion

The aspiration of this study is to determine how the COVID-19 epidemic has affected stock market returns. Descriptive statistics and a panel data regression model were used to collect and evaluate the necessary data in order to fulfill the study's goal. Following is a discussion of key findings of the study:

The study's variables include stock market returns, COVID-19 daily mortality cases, and daily infected cases. The dependent variable is the stock market return, while the independent variables are the number of infections and fatalities. The correlation coefficient has been calculated to look at how independent and dependent variables relate to one another. According to the association analysis, there was a substantial (at 1% and 5% level of significance) negative link between stock market return and COVID-19-related factors. It suggests that COVID-19 and stock market return have a negative correlation. This outcome is aligned with the research of Al-Awadhi et al. and Shapkota (2020).

The panel regression random effect model has been used to determine the influence so as to quantify the impact of COVID on stock market returns. When taking into account all 30 stock markets, the DGIC coefficient is discovered to be negative and significant at the 5% level. This finding shows that daily COVID-19 infections have a substantial negative influence on stock market performance, and the study's null hypothesis is rejected since there is compelling data to support the alternative hypothesis. This study suggests that the COVID-19 pandemic infection is more concerning to stock market investors than fatalities brought on by the corona virus.

The regression result of DGDC of overall (30 stock market) shows the negative insignificant coefficient. It means that daily death of COVID-19 has insignificant negative impact on stock market returns. The null hypothesis, according

to which there is no discernible effect of COVID-19 mortality cases on stock market returns, cannot be rejected.

According to the size of stock markets (i.e. large, medium, and small size), it is found that the small size stock markets are found more affected (high negative significant coefficient of DGIC) than large and medium size stock markets. The large size stock markets are found considerably affected by the COVID-19 death cases. This finding shows that the investors of the large size stock markets are more sensitive in COVID-19 death rather than infection.

The study's findings suggest that there is a size effect in the influence of COVID-19 on stock market returns, with medium size stock markets being more affected than big and less affected than small size. The claim that the market size has no appreciable influence on COVID-19's effect on stock market return is thus refuted.

To observe market trends, one purpose of this work is to plot stock market indexes across time. After observing the pattern of stock market indices before and after COVID-19, it makes clear that there is sever influence of corona virus on stock market returns; the stock markets were operating smoothly before January 2020 (before COVID-19). There was not much fluctuation in the sampled stock markets till the end of December 2019. But after January 2020, the stock markets were declined in the countries when the COVID-19 infected cases identified.

Main causes behind the fluxion of stock markets were COVID-19 pandemic. Due to uncertainty of the economic environment the stock market investors wanted to make them save. So, they had drawn their investment from stick markets. Because of high supply and low demand of stocks, the price of the stock declined day by day for some time. But this situation did not remain for long time because investment opportunities became limited due to the lockdown. Hence, number of investors increased in the stock markets and started to recovery position. The results of this investigation are consistent with those of (Al-Awadhi et al., 2020; Bowes, 2018; Liu et al., 2020).

Conclusion

The purpose of this investigation is to look at how the COVID-19 epidemic has affected stock market performance. A causal comparative research design was used to perform this study. Descriptive statistics, regression analysis and time series plot have been employed as the major tools for analysis. The study has covered 100 days data of stock market indices, daily growth of infected and death cases from the COVID-19 infection first case identified in the 30 sampled countries. The correlation between stock return and variations in daily infected cases and this disease's mortality has been studied on a global and cross-national scale. Additionally,

categorical dummies were used to assess the effects of the categorical variable stock market size based on market capitalization.

Based on the data, it was shown that the pandemic's effects on stock returns were significantly impacted by fluctuations in the number of newly infected patients each day, both globally and across national borders. Although not significantly, the COVID-19 fatalities had a detrimental effect. COVID-19 is influenced by the stock market's categorical variables' magnitude. After January 2020, the stock markets saw greater volatility than they did in the last quarter of 2019.

It is discovered that the COVID-19 pandemic sickness negatively affects stock market results after analyzing the thirty stock market indexes throughout the world at the time of the outbreak. In particular, the daily expansion of COVID-19-infected patients is highly inversely correlated with market returns. Policymakers and stock market investors may find the study's findings valuable. Given the limits of the data used in this study, more research can be conducted with a bigger sample size and a more advanced methodology. A behavioral study of investors' responses to market movements during the pandemic era may also be conducted using primary data.

References

Al-Awadhi, A.M., Alsaifi, A., & Alhammadi, S. (2020). Death and contagious infectious disease: Impact of the COVID-19 virus on stock market returns. *Journal of Behavioral and Experimental Finance*, *27,* Article 100326.

Alsaifi, K., Elnahass, M., & Salama, A. (2020). Market responses to firms' voluntary carbon disclosure: Empirical evidence from the United Kingdom. *Journal of Cleaner Production, 262*, Article 121377.

Beaulieu, M. C., Cosset, J. C., & Essaddam, N. (2006). Political uncertainty and stock market returns: evidence from the 1995 Quebec referendum. *Canadian Journal of Economics*, *39*(2), 621-642.

Buhagiar, R., Cortis, D., & Newall, P.W. (2020). Why do some soccer bettors lose more money than others? *Journal of Behavioral and Experimental Finance*, (*18)*, 85–93. 10.1016/j.jbef.2018.01.010

Corbet, S., Larkin, C., & Lucey, B. (2020). The contagion effects of the COVID-19 pandemic: Evidence from gold and crypto currencies. *Finance Research Letters, 35*(1), Article 101554.

David, R. B. (2018). Stock market volatility and presidential election uncertainty: Evidence from political futures markets. *Journal of Applied Business Research, 34* (1), 143-150.

Ding, W., Levine, R., Lin, C., & Xie, W. (2020). Corporate immunity to the COVID-19 pandemic. *National Bureau of Economic Research, 143* (2), 179-198.

Fama, E. F. (1998). Market efficiency, long-term returns, and behavioral finance. *Journal of Financial Economics*, *49*(3), 283-306.

Fama, E. F., Fisher, L., Jensen, M. C., & Roll, R. (1969). The adjustment of stock prices to new information. *International Economic Review*, *10*(1), 1-21.

Gormsen, N.J., & Koijen, R.S.J. (2020). Coronavirus: Impact on stock prices and growth expectations. *Working Paper,* University of Chicago Booth School of Business.

Kaplanski, G., & Levy, H. (2010). Sentiment and stock prices: The case of aviation disasters. *Journal of Financial Economics*, *95*, 174-201.

Kowalewski, O., & Śpiewanowski, P. (2020). Stock market response to potash mine disasters. *Journal of Commodity Markets*, *20*, 100124.

Li, K. (2018). Reaction to news in the Chinese stock market: A study on Xiong'an new area strategy. *Journal of Behavioral and Experimental Finance*, *19*, 36–38.

Liu, H., Manzoor, A., wang, C., Zhang, L;, & Manzoor, Z. (2020). The COVID-19 outbreak and affected countries stock markets response. *International Journal of Environmental Research and Public Health,* 17, 1-19.

Pedroni, P. (1999). Critical values for cointegration tests in heterogeneous panels with multiple regressors. *Oxford Bulletin of Economics and Statistics, 61* (Special Issue), 653-678.

Ramelli, S., & Wagner, A.F. (2020). Feverish stock price reactions to COVID-19. *Review of Corporate Finance Studies, 9*(3), 622–655.

Ruiz Estrada, M. A., Koutronas, E., & Lee, M. (2020). Stagpression: The economic and financial impact of Covid-19 Pandemic. *Contemporary Economics, 15* (Special Issue)*,* 19-33.

Sansa, N. (2020).The impact of the COVID-19 on the financial markets: Evidence from China and USA. *Journal of Social Science and Humanities,* (2), 29-39.

Sapkota, S.P. (2020). Impact of epidemic infectious disease and death on stock return: evidences from Asian stock markets with COVID-19. *Contemporary Research: An Interdisciplinary Academic Journal*, *4* (1), 174-191.

World Health Organization (2020). Novel Coronavirus (2019-nCoV), Situation Report – 1, 21 January.

World Health Organization. (2020). Novel Coronavirus (2019-nCoV), Situation Report – 10. 30 January.

World Health Organization. (2020).Novel Coronavirus (2019-nCoV), Situation Report – 22. 11 February.

World Health Organization. (2020).Novel Coronavirus (COVID-19), Situation Report – 137. 05 June.