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Assessing the Effects of COVID-19 on Stock Markets in the GCC Countries: Evidence from Sector-wise Panel Data Analysis

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ABSTRACT

This paper investigates the effect of the COVID-19 on the stock prices in service, industrial, and financial sectors using daily data for 295 companies from January 1, 2020, to February 23, 2021, in the GCC countries. The panel data techniques are utilized based sector-wise in each country: random-effect model, fixed-effect model, and Hausman test. The impact of COVID-19 was analysed during two phases. The first phase included analysing the financial markets' response from 01-01-2020 to 30-07-2020. The second phase is the analysis of the financial market response from 01-08-2020 to 23-02-2021. The first phase of results show that the COVID-19 outbreak leads to decreasing stock market prices in GCC countries. The empirical results show that the COVID-19 outbreak has badly hit the stock markets in Saudi Arabia, United Arab Emirates, and Qatar while the stock markets in Bahrain, Kuwait, and Oman are the least impacted countries in GCC. Furthermore, the sector-wise analysis results reveal that the financial sector in Saudi Arabia is the most affected by the COVID-19 outbreak in GCC countries. However, the response of stock markets to COVID-19 varied over time. The second phase's findings confirm that the negative impact of COVID-19 on stock markets in the GCC countries has faded in most sectors due to government support.

Keywords: COVID-19, Stock Markets, GCC Countries

JEL Classification: O57, O53, C33, E44

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1. Introduction

COVID-19 has affected the economic and social life in the world as precedent pandemics. After the COVID-19 outbreak occurred in Wuhan, China, in December 2019, its impact was initially thought to be local but soon spread to other cities in China and then to the whole world. In the first period, countries such as Iran in the middle east and Italy in Europe were most affected (McKibbin and Fernando, 2020). On March 11, 2020, the World Health Organization officially announced that the COVID-19 outbreak was a global pandemic (WHO, 2020). Following this, the economic effects of the pandemic also manifested themselves. Necessary measures are required to discuss the health effects of this COVID-19 pandemic and its economic effects. It is argued that the restricted economic activities will affect the global supplies, tourism and aviation sectors, and global supplies intensely in the first place, but will lead to increased unemployment and economic contractions in the long run (Zhang *et al*., 2020). Thus, companies will be in financial liquidity shortage that cannot protect their profitability. Ultimately, if there is no government support, these companies may be closed down.

For this reason, it is possible to state that financial markets are profoundly affected by this process. Since the impact of the COVID-19 will be as significant as the present, the stock market will be affected in the future. Therefore, investors will tend to sell stocks due to concern for the future (Liu *et al*., 2020). From these reasons, financial markets need more attention in this pandemic period to protect them against the financial effects of the COVID-19.

In addition to global impact, it is essential to state the regional impact of the COVID-19. This is exemplified by the fact that the Gulf Cooperation Council (GCC) Countries (Bahrain, Kuwait, Oman, Qatar, Saudi Arabia, United Arab Emirates) represent the new faces of economic prosperity with considerable financial accumulation through natural resources revenues (Mishrif & Akkas, 2018). As a consequence of natural resources revenues, oil and gas, the GCC states now have an influential position in the global economy; their involvement in global economics affects a variety of areas, including trade integration, the stock market, government investment and the creation of various financial funds (Hertog, 2007). This involvement has enabled these countries to play a crucial role in the global financial system, particularly since the post-2000 era (Mishrif and

Akkas, 2018). Moreover, it is notable that the GCC countries' economies have accumulated massive financial reserves since 2000 (Rehman, 2010), which has led to fundamental transformations in the topography of the global economy. However, it becomes unavoidable that these countries are also influenced deeply by the financial impact of COVID-19 and its health effect.

Along with the general background of the COVID-19 and its global and regional impact, this paper argues that COVID-19 negatively affect the GCC countries' stock markets that engage the global financial system through their natural resources revenues. In correspondence with this argument, the main question of the paper is looking for how COVID-19, empirically, affects the stock market in the GCC countries. Therefore, presenting this problem empirically constitutes the main motivation of the paper. In order to achieve this objective, this paper is comprised of six sections. Following the introduction, the second section examines the impact of pandemics on the financial markets and stock markets in particular in order to present the relationship between pandemics and stock markets. The third section presents the GCC countries' development regarding the evolving of the COVID-19 and fluctuation in the stock markets. The fourth section uses the Hausman test to select between a random-effects model or fixed-effects model in panel analysis using daily new COVID-19 cases and total COVID-19 cases and stock prices from six GCC countries. The fifth section provides the data collection process and econometric analysis results by considering each sector and country in the GCC countries. The last section concludes with an overall evaluation taking into consideration all of the results.

2. Reviewing the Nexus between the Pandemics and Stock Markets

Stock markets are likely affected by any crisis or disasters caused by the environmental (Alsaifi *et al*., 2020; Guo *et al*., 2020), political (Bash and Alsaifi, 2019; Shanaev and Ghimire, 2019) and economic factors (Bala and Takimoto, 2017; Cakan *et al*., 2015) in the world or a particular country. Also, there are limited studies regarding the effects of pandemics such as Severe Acute Respiratory Syndrome (SARS) outbreak (Beutels *et al*., 2009; Chen *et al*., 2009; Chen *et al*., 2007; Chen *et al*., 2018) and Ebola Virus Disease (EVD) outbreak (Ichev and Marinč, 2018) in the

world. However, during the COVID-19, there are some studies, which have examined the effect of the COVID-19 pandemic on the stock markets (Al-Awadhi *et al*., 2020; Ashraf, 2020; Baker *et al*., 2020; Liu *et al*., 2020; Ozili and Arun, 2020; Zhang *et al*., 2020) even though it occurred very recently.

According to recent studies with the COVID-19, Liu *et al*. (2020) discuss the impact of the COVID-19 outbreak on stock market indices of 21 leading countries. This study concluded that COVID-19 pandemic has a significant and negative effect on stock markets in sampled countries. In a similar study, Baker *et al*. (2020) compare the effects of COVID-19 on the US stock markets with the outbreaks experienced in previous years (1918-1919, 1957-1958 and 1968), they concluded that the current pandemic has more compelling power on economy. Ozili and Arun (2020) examines the effects of social distance policies on economic activities and the stock market; finds that the measures taken have adverse effects on economic activities and share prices (closing, opening, lowest and highest).

Reaching similar results, Ashraf (2020) examines the reaction of stock market markets in 64 countries to COVID-19 cases and deaths; concludes that stock market markets respond very quickly to the number of cases and are negatively affected by these situations. By considering risk factors, Zhang *et al*. (2020) produces a general map of country-specific risks and systemic risks in the global financial markets and concludes that the stock markets' response to the pandemic in the top ten countries is related to the severity of COVID-19 cases. They also remark that losses in economies in countries cause volatility and unpredictability in the stock markets. Al-Awadhi *et al*. (2020) examined the effect of COVID-19 on the stock market in China. They conclude that daily COVID-19 cases and deaths have negative and significant effects on all companies' stock returns. Contrary to these results, Onali (2020) finds that COVID-19 cases and deaths do not affect the US stock market despite finding a positive effect on Dow Jones and S& P500 returns in some countries in the sample. Besides, he finds that death cases in Italy and France have a negative effect on stock market returns in these countries, while VIX has a positive effect on returns.

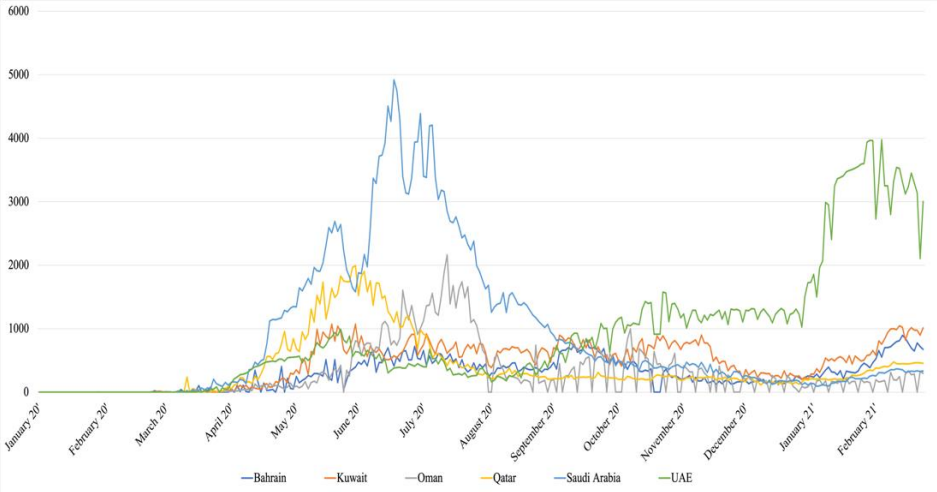
Based on the literature mentioned in this section, it is possible to state a relationship between stock markets and COVID-19, whether positive or

negative. When it comes to financial markets, GCC countries are worth analysing because they have a global size due to their current oil revenues and have an important place in the global financial system. In addition, these countries are directly affected by the crises, as they have an economy that is not diversified (Ari *et al*., 2019). However, as the current pandemic's effect differs according to the sector, the stock markets of these countries will be examined on a sectoral basis. Also, as the initial impact of the pandemic will decline with government support, it will be subject to two different analyses before and after the breakout period. From this point of view, this paper performs a comparative analysis by sector and countries in the GCC countries. By doing this, this paper contributes to the literature.

3. How Does COVID-19 Evolve in the GCC Countries?

The first case in GCC countries was detected on January 29, 2020, in a family from China in the UAE (Duncan, 2020). Then there was news of the cases in the other GCC countries. The first cases were generally seen in citizens and expatriates who visited Iran (Alandijany *et al*., 2020). Subsequently, measures have been taken in each GCC countries. Showing a parallel with the world, some preventive measures were closing schools, suspending flights, closing workplaces, closing places of worship and expanding sterilisation activities. Despite all these measures, the number of cases in GCC countries has increased day by day. The reasons for this increase may be that there are too many expatriates in these countries. Travels of expatriates increased the cases in these countries. For example, over 3000 Indians have been infected until April across the world, and about 60% of them are located in the GCC countries (Özoral, 2020). In this case, GCC countries take measures for expatriates. As a result of this fact, it is possible that indicate that the GCC countries' economies can be affected negatively by these measurements against expatriates because of their demographic imbalances.

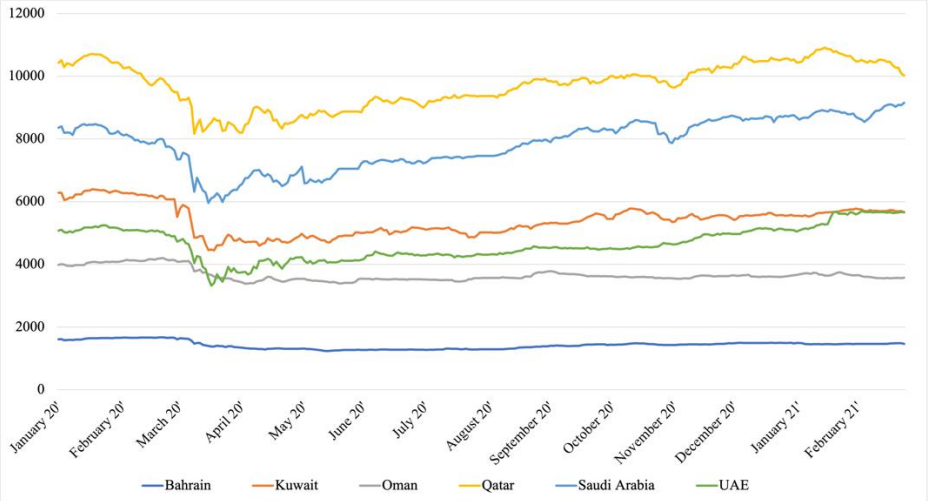
Figure 1: COVID-19 New Cases in the GCC Countries



Source: Thomson Reuters Datastream

As seen in Figure 1, there has been a few cases until March, but the new cases have increased from March. Saudi Arabia, which has the largest population among the GCC countries, ranks first with a total number of nearly 50000 cases as of mid-May. Saudi Arabia is followed by Qatar, although it is one of the countries with the lowest population among GCC countries. The total number of cases close to 30000 is observed in Qatar. The third country with the highest number of cases is seen in the UAE. According to this figure, the most remarkable country is Oman and Qatar. Although Qatar has the lowest population after Bahrain in the Gulf region (Center, 2020), it ranks second in the number of cases after Saudi Arabia. Oman has the lowest number of cases in the region, although it is the third country with the highest population in the Gulf region. According to Figure 1, while the UAE has seen an increase in new cases since July, there has decreased in other GCC countries. Since October, the country with the highest number of daily cases has been the UAE. However, by 2021 there is an increase in new cases in all GCC countries.

Figure 2: Stock Market Price Indexes in the GCC Countries



Source: Thomson Reuters Datastream

As shown in Figure 2, March was the breaking point for markets. Looking at the same period, the total number of cases and new cases started to increase in the region. The stock markets in GCC countries have been adversely affected by the world COVID-19 cases; as seen in Figure 2, there has been a negative relationship between stock markets and COVID-19 cases. While the COVID-19 cases have increased, stock market prices decreased. The COVID-19 cases have fluctuated by increasing, stock market prices indexes have also fluctuated but by declining in April and May.

The conclusion drawn from both figures shown is that the effect of this situation on the stock markets, together with the fluctuations in the new cases, may be different in empirical results with the governments' different incentives. Furthermore, in some countries, such as the UAE, although new cases have increased after July, there is no similar change in the stock markets. Thus, it is worth to examine the impact of COVID-19 cases across the world on stock markets in GCC countries empirically, as these countries are important actors in the global financial system.

4. Methodology

Panel data analysis is used in each sector for each country to deal with two dimensional cross-sectional and time series. The fixed and random effects model is used to capture the effect of the COVID-19 outbreak on the stock prices in GCC countries. The equation (1) below represents the research model with the panel data of the random effect.

$$STOCK_{i,t} = a_0 + \beta_1 COVID_{i,t} + \beta_2 MC_{i,t} + (\nu_i + \varepsilon_{i,t}) \quad (1)$$

Where *STOCK* is the price of stock *i* at day *t*, *i*=1,… and N represents the number of companies in each economic sector in each country (cross-sectional panel companies for the period *t*), *t=1,2,3…T* represents the number of periods *COVID-19* is either the logarithm of the total confirmed world cases. MC is the logarithm of daily market capitalisation. $\varepsilon_{i,t}$ is the error term. ε_(i,t) is the residual as a whole where the residual is a combination of cross-section and time series, ν_i is the individual residual, which is the random character of unit observation.

In the fixed-effect model, the ¬ν_i are not treated as draws from any kind of distribution. Therefore, between effects (associations at a higher level) cannot be estimated, and the model can be reduced to:

$$STOCK_{i,t} = a_0 + \beta_1 COVID_{i,t} + \beta_2 MC_{i,t} + \varepsilon_{i,t} \quad (2)$$

This paper uses the Hausman test to select between a random-effects model or fixed-effects model in panel analysis to fit the research data to capture the effect of COVID-19 on stock prices in each economic sector of the GCC countries. The null hypothesis of the Hausman test is that the random-effects model is preferred or consistent, while the fixed-effects model is preferred under the alternative hypothesis. Baltagi (2005):

$$H' = (b_{FE} - b_{MEANS})' \left[Asy.Var[b_{FE}] + Asy.Var[b_{MEANS}]\right]^{-1} (b_{FE} - b_{MEANS}) \quad (3)$$

5. Data and Empirical Tests

5.1. Data Collection

The data in this paper include companies in the Bahrain Bourse (Bahrain Stock Exchange), Boursa Kuwait (Kuwait Stock Exchange), Muscat Securities Market, Qatar Stock Exchange, Tadawul (Saudi Stock Exchange), Abu Dhabi Securities Exchange, and Dubai Financial Market over the period from January 1, 2020, and February 23, 2021. Data, including stock prices and market capitalisation, were collected from Thomson Reuters Datastream and cover 295 companies categorised as services, industrial, and financial sectors. The data of total COVID-19 cases and daily new COVID-19 cases were collected from Wealth Health Organization through Thomson Reuters Datastream.

5.2. Descriptive Statistics

Descriptive statistics and correlation matrix data are presented in Tables A1, A2, and A3 in the Appendix. The correlation matrix in Table A2 shows a negative relationship between the total number of world cases of COVID-19 and the stock price in all the sectors in all GCC countries in the first phase of analysis. In contrast, the correlation matrix in Table A3 indicates that there is no significant negative relationship between the total number of world cases of COVID 19 and the stock price in all the sectors in all GCC countries.

5.3. Empirical Tests

5.3.1. Service sector in GCC countries

The results of panel data analysis for the impact of total COVID 19 cases on stock prices in service companies in all GCC countries are illustrated in Tables 1 and 2. Table 1 shows the impact of COVID-19 from 01-01-2020 to 30-07-2020, while Table 2 shows the COVID-19 impact from 01-08-2020 to 23-02-2021.

Table 1: Results of Panel Data Fixed and Random Effect Models for the Effect of Total COVID-19 Cases on Stock Price in the Service Sector in GCC Countries from 01-01-2020 to 30-07-2021

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	All GCC Countries
Log World COVID-19 Cases	-0.0096***	-0.0061***	0.0058***	-0.0154***	-0.1781***	-0.0332***	-0.1555***
Log Market Capitalisation	0.0022	0.5406***	1.5276***	2.5472***	21.3967***	0.4683***	3.6148***
Constant	0.608***	-5.595***	-15.275***	-33.837***	-283.50***	-4.274***	-35.03***
Adjusted R-squared	0.2296	0.3240	0.5189	0.4414	0.5395	0.2424	0.1485
F-statistic	136.74***	583.55***	1066.01***	601.10***	3116.41***	438.54***	1300.31***
Hausman Test Chi-Sq. Statistic	0.000	0.000	0.000	0.000	0.000	0.000	0.0000
Model	Random effect	Random effect	Random effect	Random effect	Random effect	Random effect	Random effect

*** represents the significant level at 1%.

The Hausman test results in Table 1 indicate acceptance of the null hypothesis of the random effects model is consistent in the service sector in the GCC countries. The coefficients of total COVID 19 cases are negative and statistically significant at a 1 per cent level of significance. This means that the total COVID 19 cases have a negative effect on stock prices in service companies in the UAE, Saudi Arabia, Qatar, Kuwait, and Bahrain. The coefficient of total COVID-19 cases in the random-effect model for service companies in Oman small but positive and significant at a 1 per cent significance level. This is not a surprising result as the Omani government launched a comprehensive economic incentive package to support the companies and inject additional liquidity over US$ 20.78 billion into the economy (OECD, 2020). There are two different potential explanations for this result. First, this result reflects the ability of service companies to respond to government procedures that aim to mitigate the effects of the COVID-19 outbreak on the economy. Second, the service sector did not reflect the new information about COVID-19 in stock prices as the stock market is not efficient even at weak-form of the efficient market hypothesis (Al Samman and Al-Jafari, 2015). As also shown in Table 1, the service companies in Saudi Arabia are the most affected by the COVID-19 outbreak with a coefficient of -0.1781, followed by UAE with a coefficient of -0.0332, while service companies in Kuwait are the least affected by COVID-19 outbreak among GCC countries with a coefficient of -0.0061. The analysis of service companies in all GCC countries indicates a negative impact of the spread of the COVID-19 on stock prices.

Table 2: Results of Panel Data Fixed and Random Effect Models for the Effect of Total COVID-19 Cases on Stock Price in the Service Sector in GCC Countries from 01-08-2020 to 23-02-2021

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	All GCC Countries
Log World COVID-19 Cases	0.0050***	-0.0478***	0.0181***	0.1434***	0.3022***	0.2069***	0.2595***
Log Market Capitalisation	0.9059***	0.5839***	0.4734***	3.1990	35.7870***	1.4541***	19.9254***
Constant	-9.18***	-5.41***	-4.56***	-46.47***	-505.95***	-23.47***	-263.34***
Adjusted R-squared	0.9984	0.3395	0.5191	0.5672	0.7033	0.4556	0.9902
F-statistic	1480.71***	605.13***	1032.01***	963.77***	6098.02***	1107.83***	14637.63***
Hausman Test Chi-Sq. Statistic	12.57***	0.00	0.00	0.00	0.00	0.00	226.51***
Model	Fixed effect	Random effect	Random effect	Random effect	Random effect	Random effect	Fixed effect

*** represents the significant level at 1%.

The Hausman test results in Table 2 indicate acceptance of the random model's null hypothesis is consistent in the service sector in all GCC countries except Bahrain and the whole sample of GCC countries. The second phase analysis results for the impact of COVID-19 in all GCC countries indicate the disappearance of the negative impact of the spread of COVID-19 on stock prices in service companies. Furthermore, the analysis based country-wise shows no effect of the spread of COVID-19 on all service companies in all Gulf countries except Kuwait. On the contrary, there is a positive effect attributed to the companies' response to the economic support packages provided by the GCC governments with the increase in the spread of COVID-19. However, the results indicate the continued negative impact of the spread of COVID-19 on service companies in Kuwait. The F-test results indicate the null hypothesis of the F-test is rejected in all models presented in Tables 1 and 2. This means that all the models fit the research data, and the COVID-19 outbreak interprets the volatility pattern in the stock prices in the services companies in GCC countries during the research period.

5.3.2. The industrial sector in GCC countries

The results of panel data analysis for the impact of total COVID 19 cases on stock prices in industrial companies in all GCC countries are displayed in Tables 3 and 4. Table 3 shows the impact of COVID-19 from 01-01-2020 to 30-07-2020, while Table 4 shows the COVID-19 impact from 01-08-2020 to 23-02-2021.

Table 3: Results of Panel Data Fixed and Random Effect Models for the Effect of Total COVID-19 Cases on Stock Price in the Industrial Sector in GCC Countries from 01-01-2020 to 30-07-2020

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	All GCC Countries
Log World COVID-19 Cases	-0.0002***	-0.0011***	-0.0014***	-0.0037**	-0.2901***	-0.0038***	-0.0891***
Log Market Capitalisation	0.3627***	0.2135***	0.1566***	1.6490***	9.8873***	0.9994***	6.748***
Constant	-3.33***	-1.91***	-1.20***	-22.21***	-110.33***	-11.93***	-72.3***
Adjusted R-squared	0.9663	0.4809	0.6623	0.5950	0.2691	0.6414	0.978361
F-statistic	13075.12***	986.32***	1490.50***	893.37***	1008.19***	1087.63***	6790.08***
Hausman Test Chi-Sq. Statistic	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	22.82***
Model	Random effect	Random effect	Random effect	Random effect	Random effect	Random effect	Fixed effect

*** represent the significant level at 1%.

The results in Table 3 show that the value of the Chi-Square Statistic in the Hausman test is not significant in all the GCC countries except the entire GCC sample. This result concludes that the random-effects model is consistent with the fixed-effects model in industrial companies of all GCC countries and the fixed-effect model for all GCC countries.

The coefficients of total COVID-19 cases in the random-effects models are negative and statistically significant at a 1 per cent level of significance in all GCC countries. Moreover, the analysis of industrial companies in all GCC countries indicates a negative impact of the spread of the COVID-19 on stock prices. This means that the increase in confirmed cases of COVID-19 has a negative impact on industrial stock prices in all GCC countries. However, the magnitude of the negative impact was not the same in all Gulf countries. The coefficient of total COVID-19 cases in industrial companies in Saudi Arabia is -0.2901, which is the highest in GCC counties. This result means that the industrial companies in Saudi Arabia are the highest affected by the COVID-19 outbreak. This result is unexpected in the largest economy in GCC countries, especially after costly support packages targeting the private sector, totalling almost US$ 61 billion (KPMG, 2020a). The lowest coefficient of industrial companies in GCC countries has been reported in Bahrain with a value of -0.0002. This result has come in response to the government support by launching an economic stimulus package amounting to US$ 11 billion to support individuals and companies.

Table 4: Results of Panel Data Fixed and Random Effect Models for the Effect of Total COVID-19 Cases on Stock Price in the Industrial Sector in GCC Countries from 01-08-2020 to 23-02-2021

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	All GCC Countries
Log World COVID-19 Cases	0.0213***	0.0066***	0.0076***	-0.051***	4.2992***	0.1506***	0.8048***
Log market Capitalisation	0.1742***	0.0937***	0.1614***	2.0529***	46.4496***	2.0934***	43.023***
Constant	-1.82***	-0.77***	-1.40***	-27.40***	-715.39***	-29.19***	-550.51***
Adjusted R-squared	0.9825	0.2661	0.8133	0.6016	0.4490	0.7668	0.904
F-statistic	7055.29***	373.96***	3201.52***	888.17***	2156.68***	1933.15***	1369.49***
Hausman Test Chi-Sq. Statistic	18.009***	0.991615	0	0	0	0	553.15***
Model	Fixed effect	Random effect	Random effect	Random effect	Random effect	Random effect	Fixed effect

*** represent the significant level at 1%.

In Table 4, the Hausman test results confirm that the random-effects models are consistent for all industrial companies in GCC countries except Bahrain and the whole GCC sample. The second phase analysis results for the impact of COVID-19 in all GCC countries indicate the disappearance of the negative impact of the spread of COVID-19 on stock prices in industrial companies. Furthermore, the analysis based country-wise shows that the negative impact of the COVID-19 outbreak on industrial companies faded in all GCC countries except Qatar. This indicates the success of economic support packages in mitigating the spread of the COVID-19 on the economy. Despite this fact, the results indicate that Qatar's industrial companies continue to be affected by the repercussions of the spread of the COVID-19. The F-test confirms that all the models presented in Tables 3 and 4 fit the research data, which means that the variable of COVID-19 cases explains the share prices movements during the study period.

5.3.3. The financial sector in GCC countries

The results of panel data analysis for the impact of total COVID 19 cases on stock prices in financial companies in all GCC countries are presented in Tables 5 and 6. Table 5 shows the impact of COVID-19 from 01-01-2020 to 30-07-2020, while Table 6 shows the COVID-19 impact from 01-08-2020 to 23-02-2021. Table 5 shows that the Hausman test's null hypothesis cannot be rejected in all GCC countries except Bahrain. This leads to using the Fixed-effects model in Bahrain and the random-effects models in the UAE, Saudi Arabia, Qatar, Kuwait, and Oman.

Table 5: Results of Panel Data Fixed and Random Effect Models for the Effect of Total COVID-19 Cases on Stock Price in the Financial Sector in GCC Countries from 01-01-2020 to 30-07-2020

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	All GCC Countries
Log World COVID-19 Cases	-0.0025***	-0.0020***	-0.0001	-0.0353***	-0.3584***	-0.0568***	-0.0707***
Log market Capitalisation	0.3140***	0.1914***	0.1949***	1.9924***	4.4868***	1.8423***	2.4361***
Constant	-3.64***	-2.04***	-1.88***	-23.68***	-42.89***	-20.76***	-25.62***
Adjusted R-squared	0.9707	0.6383	0.5294	0.4949	0.5110	0.2257	0.1967
F-statistic	4523.18	3085.34	1710.31	1042.81	1906.32	554.56	2028.75***
Hausman Test Chi-Sq. Statistic	17.5792	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Model	Fixed effect	Random effect	Random effect	Random effect	Random effect	Random effect	Random effect

*** represent the significant level at 1%.

As shown in Table 5, the results of the analysis of financial companies in all GCC countries indicate a negative impact of the spread of the COVID-19 on stock prices. Moreover, the coefficients of total COVID 19 cases in random-effects and fixed-effect models are negative and statistically significant at a 1 per cent level of significance in financial companies in all GCC countries except Oman. The highest coefficient of total COVID-19 in financial companies is reported in Saudi Arabia with a value of -0.3584, followed by the UAE with a coefficient of -0.0568.

Table 6: Results of Panel Data Fixed and Random Effect Models for the Effect of Total COVID-19 Cases on Stock Price in the Financial Sector in GCC Countries from 01-08-2020 to 23-02-2021

Country	Bahrain	Kuwait	Oman	Qatar	Saudi Arabia	UAE	All GCC Countries
Log World COVID-19 Cases	-0.0043***	-0.0034***	0.0002	0.0442***	0.1790***	0.1697***	0.4912***
Log Market Capitalisation	0.1363***	0.2915***	0.0613***	2.7445***	25.4901***	1.4610***	3.2519***
Constant	-1.35***	-3.22***	-0.49***	-35.85***	-365.02***	-19.18***	-45.44***
Adjusted R-squared	0.4211	0.6865	0.7353	0.9983	0.9945	0.1605	0.1702***
F-statistic	481.88***	3702.22***	4082.68***	80543.37***	25277.69***	352.16***	1644.92***
Hausman Test Chi-Sq. Statistic	0.0000	0.0000	0.0000	4.7907	360.0889	0.4200	4.318788
Model	Random effect	Random effect	Random effect	Fixed effect	Fixed effect	Random effect	Random effect

*** represent the significant level at 1%.

As depicted in the Hausman test results in Table 6, the random-effects model is consistent in the financial companies in Bahrain, Kuwait, Oman and UAE. In contrast, the fixed-effect model is consistent for Saudi Arabia and Qatar. The second phase analysis results for the impact of COVID-19 in all GCC countries indicate the disappearance of the negative impact of the spread of COVID-19 on stock prices in financial companies. Furthermore, the analysis based country-wise shows that the negative impact of the COVID-19 outbreak on financial companies disappeared in all GCC countries except Bahrain and Kuwait. The results indicate that the financial sector in both Bahrain and Kuwait continue to be affected by the repercussions of the COVID-19 pandemic. In contrast, Government economic interventions in the rest of the GCC countries have succeeded in helping the financial sector cope with the COVID-19 crisis. The F-test value is statistically significant in all models in financial companies in GCC countries in Table 5 and 6. This result confirms that the COVID-19 outbreak is the crucial driving force in the stock prices in the financial companies in GCC countries during the research sample period.

5.3.4. Country Analysis

Based on the research results, the most affected country in GCC countries from the repercussions of the COVID-19 outbreak is Saudi Arabia. Despite the government launching large economic support packages, its economic sectors have been badly hit by the COVID-19 outbreak. The financial sector has been among the severest hit by the COVID-19 pandemic, followed by industrial sector then services sector. However, the negative impact on stock markets lasted until the end of July 2020, then companies responded positively to the government's support, and the negative impact faded on all economic sectors.

The badly hit also comes to the most diversified economy in the GCC, the UAE economy, despite a much-quick response deployment of a US$ 27 billion stimulus package to attempt to reduce the impact of the COVID-19 on the economy (KPMG, 2020b). The financial sector has been the worst hit by the COVID-19 in the UAE, followed by the services sector and then the industrial sector that is considered the least impacted sector by the COVID-19 outbreak. The negative impact on the financial markets

in the UAE also continued until the end of July. The results of the second phase confirm that the stock markets in the UAE were able to overcome the repercussions of the COVID-19 and respond to the government's measures to revive the economy. It is possible to state that the UAE government's economic incentives have been positively affected by the fact that the stock markets in the UAE are far from the initial negative impact of this situation, despite the increase in new cases in the UAE since July, as presented in Figure 1.

Qatar is the third most affected country in GCC by the COVID-19 outbreak despite various government support packages that have reached nearly US$ 20.3 billion, including nearly US$ 2.7 billion in government funds in the financial market (Dinesh Nair *et al*., 2020). The financial sector in Qatar is the hardest hit by the COVID-19 outbreak, followed by the services sector then the industrial sector. The results of the second phase, which extends from 01-08-2020 to -23-02-2021, confirm that the industrial companies continue to be affected by the COVID-19 pandemic.

The ongoing impact of the COVID-19 repercussions is still widely seen and is significantly impacting several industries. The financial sector in Kuwait and Bahrain and the service sector in Kuwait are continuing to be affected by the COVID-19 pandemic, although new cases in these countries have decreased since July.

6. Conclusion

The GCC countries represent the new face of economic prosperity, accumulating financial wealth generated through natural resources revenues. These countries have played a pivotal role in the global financial system through the new face of wealth. Thus, GCC countries have begun to use their wealth to reconfigure their position in the global financial system. From this point of view, these countries can likely be affected by any regional or global crisis arising from political, economic, environmental, natural disaster, and healthcare issues, all of which negatively the global financial system. Therefore, this research examines the effect of COVID-19 on the stock prices in all the sectors in GCC countries using daily data for the period January 1, 2020, to February 23, 2021. The impact of COVID-19 was analysed during two phases. The first

phase included analysing the financial markets' response from 01-01-2020 to 30-07-2020. The second phase is the analysis of the financial market response from 01-08-2020 to 23-02-2021.

According to econometric analysis for the first phase, the results confirm statistically that the COVID-19 outbreak leads to a decreasing pattern in stock market prices in the GCC counties. However, COVID-19 repercussions do not have the same impact on all countries and industries. Based on the analysis made for each sector in each country, it can be observed that the sector most affected by the COVID-19 in GCC countries is the financial sector followed by the industrial sector in Saudi Arabia where is a more industrialised country in the GCC countries, despite government support for companies, which reached US$ 13 billion. On the other hand, the industrial sector in Bahrain, Kuwait, and Oman is the least affected sector by spreading the COVID-19. As for the service sector, it can result that all GCC countries except Oman are negatively affected by COVID-19. It can be related to the economic structure of the GCC countries, where heavily based on the service sector. Lastly, the financial sector is affected by COVID-19 except for Oman. This result can be related to the financial structure of the GCC countries, which are heavily financialised countries through their natural resource revenues except for Oman. In general, listed companies in the stock markets of the GCC countries under the three sectors, namely industrial, service, and financial sectors, in the GCC countries are affected by the COVID-19. However, its impact on the stock markets differs from country to country in the GCC countries, as these countries have a pivotal role in the global financial system through their wealth generated by natural resources revenues.

The results of the second phase confirm that companies responded positively to the governments' support in all GCC countries. Therefore, the negative impact of COVID-19 on stock markets in all sectors disappeared. However, some sectors are continuing to be affected by the COVID-19 pandemic, which are the industrial sector in Qatar, the financial sector in Kuwait and Bahrain, and the service sector in Kuwait.

Finally, this research looks at stock price effects, which reflect the expectations of market participants for future economic consequences. However, it is worth indicating that the impact of the COVID-19 outbreak on GCC stock markets was relatively modest even over periods of several months. The ongoing assessment of the effects of the COVID-19 outbreak

on the economy is still open, and this paper analyses and results are limited with the research period from January 1, 2020, to February 23, 2021, but contribute to the literature.

References

Al Samman, H. and Al-Jafari, M. K. (2015), "Trading volume and stock returns volatility: Evidence from industrial firms of Oman," *Asian Social Science*, 11(24), 139-146.

Al-Awadhi, A. M., Al-Saifi, K., Al-Awadhi, A. and Alhamadi, S. (2020), "Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns," *Journal of Behavioral and Experimental Finance*, 100326.

Alandijany, T. A., Faizo, A. A. and Azhar, E. I. (2020), "Coronavirus disease of 2019 (COVID-19) in the Gulf Cooperation Council (GCC) Countries: Current status and management practices," *Journal of Infection and Public Health*, 13(6), 839-842.

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

Ari, I., Akkas, E., Asutay, M. and Koç, M. (2019), "Public and private investment in the hydrocarbon-based rentier economies: A case study for the GCC countries," *Resources Policy*, 62, 165–175.

Ashraf, B. N. (2020), "Stock markets' reaction to COVID-19: Cases or fatalities?," *Research in International Business and Finance*, 101249.

Baker, S. R., Bloom, N., Davis, S. J., Kost, K. J., Sammon, M. C. and Viratyosin, T. (2020), "The unprecedented stock market impact of COVID-19," *National Bureau of Economic Research*. No. w26945.

Bala, D. A. and Takimoto, T. (2017), "Stock markets volatility spillovers during financial crises: A DCC-MGARCH with skewed-t density approach," *Borsa Istanbul Review*, 17(1), 25-48.

Baltagi, B. (2005), *Econometric analysis of panel data*, 3rd edition, John Wiley & Sons: England

Bash, A. and Alsaifi, K. (2019), "Fear from uncertainty: An event study of Khashoggi and stock market returns," *Journal of Behavioral and Experimental Finance*, 23, 54-58.

Beutels, P., Jia, N., Zhou, Q. Y., Smith, R., Cao, W. C. and De Vlas, S. J. (2009), "The economic impact of SARS in Beijing, China," *Tropical Medicine & International Health*, 14, 85-91.

Cakan, E., Doytch, N. and Upadhyaya, K. P. (2015), "Does US macroeconomic news make emerging financial markets riskier?," *Borsa Istanbul Review*, 15(1), 37-43.

Center, G. R. (2020), Gulf labour markets, migration, and population (GLMM) programme, https://gulfmigration.org/

Chen, C. D., Chen, C. C., Tang, W. W. and Huang, B. Y. (2009), "The positive and negative impacts of the SARS outbreak: A case of the Taiwan industries," *The Journal of Developing Areas*, 43(1), 281-293.

Chen, M.H., Jang, S. S. and Kim, W. G. (2007), "The impact of the SARS outbreak on Taiwanese hotel stock performance: An event-study approach," *International Journal of Hospitality Management*, 26(1), 200-212.

Chen, M. P., Lee, C. C., Lin, Y. H. and Chen, W. Y. (2018), "Did the SARS epidemic weaken the integration of Asian stock markets? Evidence from smooth time-varying cointegration analysis," *Economic Research-Ekonomska Istraživanja*, 31(1), 908-926.

Dinesh Nair, Z. F., Archana N. and Nicolas P. (2020), "Qatar plans to raise $5 billion after oil rout," Bloomberg. Available at: https://www.bloomberg.com/news/articles/2020-04-02/qatar-said-to-hire-banks-to-raise-more-than-5-billion-in-bonds

Duncan, G. (2020), "Coronavirus in the UAE: A timeline of new cases and recoveries," The National. Available at: https://www.thenational.ae/uae/health/coronavirus-in-the-uae-a-timeline-of-new-cases-and-recoveries-1.985824

Guo, M., Kuai, Y. and Liu, X. (2020), "Stock market response to environmental policies: Evidence from heavily polluting firms in China," *Economic Modelling*, 86, 306-316.

Hertog, S. (2007), "The GCC and Arab economic integration: A new paradigm," *Middle East Policy*, 14(1), 52-68.

Ichev, R. and Marinč, M. (2018), "Stock prices and geographic proximity of information: Evidence from the Ebola outbreak," *International Review of Financial Analysis*, 56, 153-166.

KPMG. (2020a), Government and institution measures in response to COVID-19: Kingdom of Saudi Arabia, Available at: https://home.kpmg/xx/en/home/insights/2020/04/saudi-arabia-government-and-institution-measures-in-response-to-covid.html

KPMG. (2020b), Government and institution measures in response to COVID-19: United Arab Emirates, Available at: https://home.kpmg/xx/en/home/insights/2020/04/united-arab-emirates-government-and-institution-measures-in-response-to-covid.html

Liu, H., Manzoor, A., Wang, C., Zhang, L. and Manzoor, Z. (2020), "The COVID-19 outbreak and affected countries stock markets response," *International Journal of Environmental Research and Public Health*, 17(8), 2800.

McKibbin, W. J. and Fernando, R. (2020), "The global macroeconomic impacts of COVID-19: Seven scenarios," *CAMA Working Paper*, No. 19/2020. Available at: https://ssrn.com/abstract=3547729

Mishrif, A. and Akkas, E. (2018), "Exploring connexion between sovereign wealth funds and Islamic finance in the Gulf countries," *International Journal of Economics and Finance*, 10(5), 75-86.

OECD. (2020), COVID-19 crisis response in MENA countries, Available at: https://www.oecd.org/coronavirus/policy-responses/covid-19-crisis-response-in-mena-countries-4b366396/

Onali, E. (2020), "Covid-19 and stock market volatility," Available at: SSRN 3571453.

Ozili, P. K. and Arun, T. (2020), "Spillover of COVID-19: Impact on the global economy," Available at SSRN 3562570.

Özoral, B. (2020), "Ortadoğu'da koronavirüs mücadelesinin politik ve ekonomik yansımalarının İran ve Körfez ülkeleri üzerinden değerlendirilmesi," *İstanbul Ticaret Üniversitesi Sosyal Bilimler Dergisi*, 19(37), 1-13.

Rehman, A. A. (2010), *Gulf capital & Islamic finance: The rise of the new global players*, New York: McGraw-Hill.

Shanaev, S. and Ghimire, B. (2019), "Is all politics local? Regional political risk in Russia and the panel of stock returns," *Journal of Behavioral and Experimental Finance*, 21, 70-82.

WHO. (2020), "Rolling updates on coronavirus disease (COVID-19)", Available at: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/events-as-they-happen

Zhang, D., Hu, M. and Ji, Q. (2020), "Financial markets under the global pandemic of COVID-19," *Finance Research Letters*, 101528.

Appendix

Table A1: Descriptive Statistics

Country	Sector	Number of Companies	Number of Observations	Average Price	Average Market Capitalization
Bahrain	Services sector	6	1800	0.5165	62717.95
	Industrial sector	6	1800	0.274422	105841.7
	Financial sector	9	2700	0.325626	1131555.
Kuwait	Services sector	16	4800	0.683771	399761.3
	Industrial sector	14	4200	0.345010	92554.85
	Financial sector	23	6900	0.270578	716536.3
Oman	Services sector	13	3900	0.716410	63634.09
	Industrial sector	10	3000	0.255900	27408.16
	Financial sector	20	6000	0.155457	130627.5
Qatar	Services sector	10	3000	4.976360	7622477.
	Industrial sector	8	2400	2.51	31533556.7
	Financial sector	14	4200	4.7	19022084.4
Saudi Arabia	Services sector	35	10500	20.22	84248530.6
	Industrial sector	36	10800	23.6	555072
	Financial sector	24	7200	20.83446	24644876
UAE	Services sector	18	5400	5.52	25021630.07
	Industrial sector	8	2400	1.675613	1782938.
	Financial sector	25	7500	4.866521	13175166

Table A2: Correlation Matrix for the First Phase from 01-01-2020 to 30-07-2020

Country	Sector	Probability	Price	LogCases	LogCap
Bahrain	**Services Sector**	Price	1		
		LogCases	-0.09483***	1	
		LogCap	0.616981***	-0.220946***	1
	Industrial Sector	Price	1		
		LogCases	-0.06916**	1	
		LogCap	0.371456***	-0.010591	1
	Financial Sector	Price	1		
		LogCases	-0.15576***	1	
		LogCap	0.540251***	-0.064848**	1
Kuwait	**Services Sector**	Price	1		
		LogCases	-0.06025***	1	
		LogCap	0.413332***	-0.06219***	1
	Industrial Sector	Price	1		
		LogCases	-0.07537***	1	
		LogCap	0.674851***	-0.056843***	1
	Financial Sector	Price	1		
		LogCases	-0.13094***	1	
		LogCap	0.714261***	-0.06637***	1
Oman	**Services Sector**	Price	1		
		LogCases	-0.09129***	1	
		LogCap	-0.30236***	-0.0649***	1
	Industrial Sector	Price	1		

		LogCases	-0.08499***	1	
		LogCap	0.571394***	-0.051622**	1
	Financial Sector	Price	1		
		LogCases	-0.11272***	1	
		LogCap	0.083903***	-0.046727***	1
Qatar	**Services Sector**	Price	1		
		LogCases	-0.02919	1	
		LogCap	0.581553***	-0.021952	1
	Industrial Sector	Price	1		
		LogCases	-0.04207	1	
		LogCap	0.06359**	-0.0274	1
	Financial Sector	Price	1		
		LogCases	-0.04597**	1	
		LogCap	0.654072	-0.021701	1
Saudi Arabia	**Services Sector**	Price	1		
		LogCases	-0.07583***	1	
		LogCap	0.35859***	-0.04368***	1
	Industrial Sector	Price	1		
		LogCases	-0.06797***	1	
		LogCap	0.227007***	-0.020573	1
	Financial Sector	Price	1		
		LogCases	-0.13028***	1	
		LogCap	0.446126***	-0.023977	1
UAE	**Services Sector**	Price	1		
		LogCases	-0.0419**	1	
		LogCap	0.706922***	-0.033415*	1
	Industrial Sector	Price	1		
		LogCases	-0.07738***	1	

		LogCap	0.324607***	-0.051164*	1
	Financial Sector	Price	1		
		LogCases	-0.0299*	1	
		LogCap	0.360411***	-0.048747***	1

Table A3: Correlation Matrix for the Second Phase from 01-08-2020 to 23-02-2021

Country	Sector	Probability	Price	LogCases	LogCap
Bahrain	**Services Sector**	Price	1		
		LogCases	0.015018	1	
		LogCap	0.665706***	0.00462	1
	Industrial Sector	Price	1		
		LogCases	0.098568***	1	
		LogCap	0.548379***	0.000858	1
	Financial Sector	Price	1		
		LogCases	-0.00602	1	
		LogCap	0.62613***	0.004928	1
Kuwait	**Services Sector**	Price	1		
		LogCases	0.001619	1	
		LogCap	0.40994***	0.03075	1
	Industrial Sector	Price	1		
		LogCases	0.037102*	1	
		LogCap	0.700962***	0.046921**	1
	Financial Sector	Price	1		
		LogCases	0.045937***	1	
		LogCap	0.714032***	0.026351	1
Oman	**Services Sector**	Price	1		
		LogCases	-0.00388	1	

		LogCap	-0.26943***	-0.02094	1
	Industrial Sector	Price	1		
		LogCases	0.058088**	1	
		LogCap	0.560926***	0.030161	1
	Financial Sector	Price	1		
		LogCases	-0.02926	1	
		LogCap	0.217795***	-0.03455*	1
Qatar	**Services Sector**	Price	1		
		LogCases	0.050925*	1	
		LogCap	0.544912***	0.046563*	1
	Industrial Sector	Price	1		
		LogCases	-0.03358	1	
		LogCap	-0.01797	-0.01294	1
	Financial Sector	Price	1		
		LogCases	0.030691	1	
		LogCap	0.601696***	0.022945	1
Saudi Arabia	**Services Sector**	Price	1		
		LogCases	0.081415***	1	
		LogCap	0.221087***	0.051589***	1
	Industrial Sector	Price	1		
		LogCases	0.189953***	1	
		LogCap	-0.00095	0.0904***	1
	Financial Sector	Price	1		
		LogCases	0.092738***	1	
		LogCap	0.355119***	0.020744	1
UAE	**Services Sector**	Price	1		
		LogCases	0.050659***	1	

		LogCap	0.604481***	0.032079*	1
	Industrial Sector	Price	1		
		LogCases	0.113471***	1	
		LogCap	0.419318***	0.03705	1
	Financial Sector	Price	1		
		LogCases	0.013242	1	
		LogCap	0.36375***	0.025519	1