Research Article
Volume 13:1, 2023

Arabian Journal of Business and Management Review

ISSN: 2223-5833 Open Access

The Nexus between COVID-19, Government Intervention and Stock Market Returns: Evidence from Kingdom of Bahrain

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Abstract

The paper aims empirically investigate the impact of government interventions during COVID-19 pandemic on stock returns in Bahrain. Using the Autoregressive Distributed Lag (ARDL) bounds test method in the analysis and daily data from 24 Feb 2020 till 12 Feb 2021, empirical results demonstrate that Bahrain stock market responded negatively to the growth in confirmed cases. The significant results indicate the strong reaction of stock markets towards the COVID-19. In addition, the direct impact of social distancing policies on stock market return appeared positive and significant suggesting that the social distance policies did not have a negative impact on the performance of Bahrain stock markets. Whereas, the interactive impact of government interventions on stock market return through the growth in confirmed cases was found positive but not significant. This outcome suggests that the adverse effect of growth in confirmed cases on stock market returns do not dampen with further stringent social distancing policies. Therefore, our findings imply that government interventions impact related to social distancing measures is not channeled through the dropping in confirmed cases. Our findings provide valuable insights and the guiding light to the governments and policymakers to devise their economic response to the pandemic and to manage the impact of COVID-19 disease on Bahrain stock markets.

Keywords: Stock return • COVID-19 • Stringency index • Social distancing

Introduction

COVID-19 pandemic has disrupted all walks of life including economic, social, political and financial. There is not a single segment of economy which is unscathed by the adversities of the COVID-19 pandemic. It also affected the global economic activities as most of the economic activities are inter-dependent. For example; the virus started in China and closure of border to China by the countries resulted in halting the supply chain as China is the major supplier of the raw materials to the most part of the world. The uncertainty created by the pandemic has affected the smallest as well as the largest economies of the world, including Bahrain, USA, China, Italy, United Kingdom, Russia, Saudi Arabia, India and Iran etc., The financial market is the barometer of the economic performance of any country and therefore was expected to be affected by this major incident and it got affected severely. The financial markets noticed abnormal behavior during the COVID-19 pandemic and recorded high volatility in both volume and price. Hassan et al. refer to this pandemic as the mother of all crises, a bigger financial crisis than the financial crisis of 2008 and comparable to the great depression of 1930's. Furthermore, investors have lost good chunk of money due to uncertainty and fear. For example, COVID-19 affected the global stocks adversely and investors lost 6 trillion Dollar between 24 to 28 February and Standard and Poor (S and P) index fell by more than 30% after the COVID-19 outbreak [1].

In the same line, COVID-19 pandemic induced market to 2020 stock market crash, also known as Coronavirus crash that started in February and lasted till 7th April 2020. At the same time, countries also brought stricter lockdown and quadrantile policies for the domestic movement of people and control the spread of the virus and consequently halting the production activities and complete shutdown of the economic activities. However, the lockdown and social distancing measures announced by the governments have adversely affected the economies as resulted into the shutting down of the economic activities with no production, increased market illiquidity, almost no spending from the daily wage laborers and vulnerable, volatility and worsening of market steadiness [2].

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Received: 10 September, 2022, Manuscript No. JBMR-22-74235; **Editor assigned:** 13 September, 2022, PreQC No. JBMR-22-74235 (PQ); **Reviewed:** 28 September, 2022, QC No. JBMR-22-74235; **Revised:** 31 December, 2022, Manuscript No. JBMR-22-74235 (R); **Published:** 13 January, 2023, DOI: 10.37421/2223-5833.2023.13.467

Kingdom of Bahrain recorded its first COVID-19 case on 24 February 2020. A Bahraini woman travelling from Iran *via* Dubai was examined as a part of the precautionary measure and she was tested positive [3]. Bahrain government took the immediate stock of the situation, suspending all flights from Dubai and Sharjah for 48 hours and suspended all travel from Republic of Iran [4]. Later, next day on 25 February again nine new cases were recorded, all cases were linked to the travel history from Iran [5]. In can be observed from the Figure 1 that, the trend of the COVID-19 cases shows that total confirmed new cases started to rise in April 2020 onwards and it was the time when COVID-19 cases were on the rise all across the globe [6]. During this period Bahrain government announced the social distancing and lockdown measures to control the spread of the virus and cases dropped in the month of October and November. The total cases in Bahrain are still higher and with the second wave already started as it can be seen from Figure 1 that daily cases started to rise from December onwards and reached up to 575 on 21 February 2020 [7].

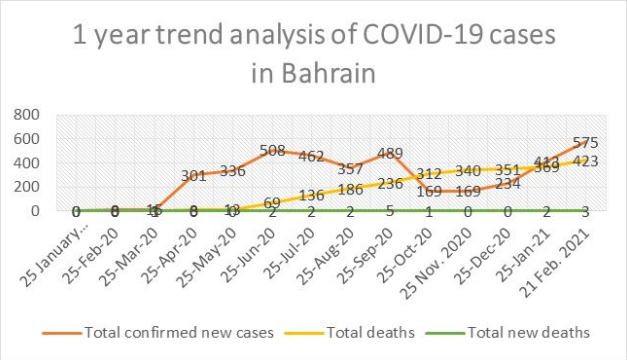

Figure 1. 1 year trend analysis of COVID-19 cases in Bahrain.

This paper focused on the Kingdom of Bahrain due to the following reasons. First, Bahrain is similar to other GCC countries, only Bahrain was chosen to determine the detailed response of the governmental interventions during the COVID-19 on stock market return. Second, recent studies are focused either on South Asia, European countries or American countries, hence, there is need to do an extensive analysis of Bahrain governmental interventions during the COVID-19 on stock market return [8]. Bahrain is a small island nation with high dependency on oil revenue with a population of around 1.7 million, the smallest country among the GCC nations. Bahrain is suffering from the dual shock of oil price shock as well as COVID-19 pandemic as more than 70% of the revenue comes from the export of oil alone. The high degree of dependency on oil revenue makes Bahrain vulnerable to such shocks and results into the panic [9]. Third, the returns in Bahrain markets have different pattern than the global stock return mainly due to the sharia indices, dominance by the domestic investors, no option of investment in the derivative products and most of the financial contracts are based on the Profit and Loss Sharing, PLS [10]. Finally, Bahrain has around 8.62% of the total confirmed cases and 3.74% of the total confirmed deaths. On the other side, the total population percentage of Bahrain among GCC countries is only around 3.09 percent of the total 53.64% of the total GCC population. Keeping in view the moderate share of population of Bahrain among the GCC countries, the total cumulative confirmed cases are huge [11].

Government of Bahrain announced the stimulus package on March 17, 2020 to support the citizens, residents, small and medium enterprises and corporates and to inject the liquidity into the market [12]. The important highlights of the stimulus announced by the Bahraini government are highlighted in the Figure 2. It can be observed that government paid the salary of private sector employees for three months, loan payments were deferred for the Bahraini citizens till the end of 2020 [13].

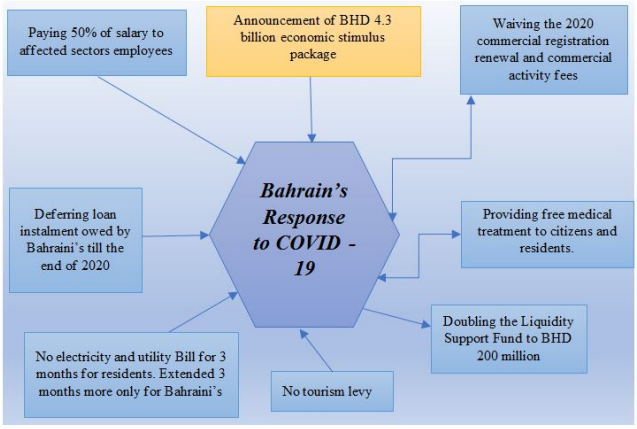

Figure 2. Bahrain's social distancing measures (Timeline).

The present study is expected to enrich the existing strand of literature in three ways. First, the impact of COVID-19 is still at the estimation stage and there is no country which can be termed as ideal in response to the pandemic with reference to the impact of COVID-19 on financial sector [14]. In addition, this study assesses Bahrain government interventions towards COVID-19 pandemic in the interactive effect of growth in confirmed cases stock market returns nexus. Second, the autoregressive distributed lag model is employed to examine the impact of government interventions on Bahrain stock market return during COVID-19 [15]. The ARDL estimation technique developed by Pesaran, Shin and Smith has some unique characteristic compared to other cointegration tests. It is efficient in estimating a mix of order of integration, means I (0) and I (1). The estimation procedure based on ARDL bounds testing approach is less complicated because it utilizes a single-equation set-up [16]. Moreover, since various lag-lengths enter the model so the interpretation of each variable can be dedicated to various lag-lengths. Third, this study will provide the guiding light to the governments and policymakers to devise their economic response to the pandemic and to manage the impact of COVID-19 disease on Bahrain stock markets [17].

The paper is organized as follows; in the next section we provide the review of relevant literature on impact of COVID-19 on stock returns, the reaction of the various stock indices to the pandemic and economic disruptions caused by the pandemic on different sectors of the economy [18]. Section three presents the research methodology and section four presents the analysis of data and discussion. Finally, in section five we conclude and provide further scope of the study [19].

Materials and Methods

During the first year of the pandemic a series of studies have been conducted on the impact of COVID-19 on different sections of the

economy. Most of the studies focus on the overall impact of the pandemic on specific part of the region or economy without focusing on the specific country [20]. However, it can be argued that the impact of the pandemic is subject to the nature of the economy and various other characteristics such as, whether the economy is agriculture dependent, oil importing or oil exporting and so on. Various studies related to the nature of our study are reviewed as follows [21].

The most comprehensive study came from the, where they performed the network analysis of the global stock market at the beginning of the pandemic, from October 15, 2019 to August 7, 2020. The paper utilized the complex network method to investigate the impact of pandemic on 56 global stock indices of developed, emerging and frontier markets before and during the pandemic [22]. The study concluded that the pandemic had adverse effect on the global stock indices as they found structural changes and reduced connectivity. Furthermore, it revealed that the level of impact changes with the development of the stock market in the country. For example; Emerging market do have the contagion effect in the network structure whereas, developed and frontier market do not have the contagion effect [23]. The study suggested to have the integrated policy making to fight the adverse impact of the pandemic on the stock market. The government and policy makers must design strategies to stabilize the market and bring investors trust in the market. A study conducted by Zaremba took stock market data of 49 countries classified into developed and emerging markets between the periods of 1 January 2020 till 3 April 2020 and concluded that effect of governmental interventional is limited in scope [24]. Another study came from Nguyen that examines the impact of the pandemic on the stock market returns. This study utilized panel data regression analysis on the Stock indices in the Gulf Cooperation Council (GCC) countries where they concluded that the indices in the GCC countries responded negatively to the rise in the number of confirmed cases and death cases. As the confirmed cases began to rise, the stock returns from the major indices in GCC countries began to decline. The study further concluded that, GCC stock market are positively correlated to the crude oil prices whereas, it is negatively correlated to the global oil and stock market [25]. The market responded strongly to the COVID-19 pandemic and nature of response depends on the stage of the pandemic. In an another study on the impact of COVID-19 on stock market reaction in GCC countries by using panel data regression over the period of April 1, 2020 to June 26, 2020, it has been argued that Although the daily stock market reaction to the daily confirmed cases in these countries are not significant whereas the market reaction to the daily death cases were negatively correlated. The pandemic interacts negatively to the stock market returns [26]. The response to the pandemic in Middle East and Arab countries is determined by the factors such as; curb on the frequent religious gathering, regional conflicts, compromised health and sanitation system, low degree of transparency and cooperation. These factors are interconnected and will decide the chances of success of the efforts of the governments and officials' response to the pandemic in the region [27].

To sum up, more than 100 countries around the world have taken various severe policy measures in the end of March 2020, such as social distancing, restrictions on international and internal travel and workplace closing. These restrictions on internal movement and policy responses for instance: Workplace and school closings aim to establish the social distance between people to curb the virus expansion [28]. However, these undertaken restrictions directly affect the economic and social activities negatively. Moreover, the undertaken measures generated more uncertainty and unsureness despite their impact and effectiveness. For Example, although the lockdown leads to reduce the infections, the salary of millions of people has decreased and others lost their jobs. Besides, COVID-19 generated panic sentiments that impacted the behavior of investors and created high volatility in financial markets. Mainly, investors become more cautious during bearish trends in stock markets. In the same line, investors are unwilling to trade and looking for safe havens in order to avert financial losses that impact the financial markets negatively due to the backdrop of uncertainty and ambiguity. In addition, Mamaysky argued that the price movements of financial markets are affected by the sentiments linked to the news of COVID-19 and the sentiments of investors on future investments also impacted the stock markets within the period of COVID-19 [29].

On the other hand, the indirect impact of government interventions channels through decreasing the intensity of COVID-19 outbreaks. Strict and comprehensive government interventions like stringent social distancing measures might lead to reduction of new infections [30]. Based on the recent researches for instance which argued that stock markets in the world have a strong negative return to COVID-19, we state that the negative market reaction to the growth in confirmed cases of COVID-19 will be weak if serious government interventions reduce the intensity of local outbreaks [31].

In short, COVID-19 disease has a critical impact on stock market return. Nevertheless, a much more systematic method which examines the impact of government interventions on stock market return during COVID-19 is still limited in the case of Bahrain. Therefore, the present study takes the first step in this direction [32].

Methodology and data

Empirical model: The empirical model of this paper is based on Ashraf. Following these studies, the empirical linkages between government interventions and stock market return during COVID-19 is examined by using the following equation:

$$SR_t=\beta_0+\beta_1 G_t+\beta_2 SI_t+\beta_3 IS_t+\beta_4 EX_t+\beta_4 OP_t+\varepsilon_t \quad (1)$$

Where, SR refers to the stock market return, β refers to the parameter to be estimated, G refers to the growth in confirmed cases of COVID-19, SI refers to Stringency index, IS refers to income support, EX refers to the exchange rate, OP refers to the oil price and ε_t refers to the error term. All variables are converted into natural logarithm. In order to examine the indirect impact of growth in confirmed cases on stock market return through government interventions channel, this study involves the interaction term as follow [33]:

$$SR_t= \beta_0+\beta_1 G_t+\beta_2 SI_t+\beta_3 (G_t x SI_t)+\beta_4 IS_t+\beta_5 EX_t+\beta_6 OP_t+\varepsilon_t \quad (2)$$

The variable of interest is the interaction term ($G_t \times SI_t$) where its coefficient β_3 is expected to be positive. If $\beta_1$has a significant negative sign, this indicates that the growth in confirmed cases of COVID-19 has a significant negative impact on stock market return. The parameters β_4 and $\beta_6$are projected to have positive sign whereas the remaining parameters, β_2 and β_5 are expected to be negative [34].

Econometric estimation methods: This study employed the Augmented Dickey Fuller (ADF) and Phillips Perron (PP) tests in order to assess the presence of a unit root in the series of the dependent and independent variables involved in our model [35]. The researchers such as Ricky and Law argue that, the pre-testing of series for the order of integration is not required in the ARDL bound co-integration test. Additionally, this study utilized the bounds test method based on the Autoregressive Distributed Lag (ARDL) test to check the existence of the relationship between the dependent variable and the regressors. The ARDL framework can estimate the short-run and long-run relationships between the dependent and the explanatory variables regardless if the underlying regressors are I (0), I (1) or mutually cointegrated [36].

Hence, based on Pesaran this study estimated the long-run relationship between the dependent and independent variables. The same lag length is contingent on autocorrelation or serial correlation test and if there is a problem of serial correlation, then to obtain different lag length (p, q, r, s, t, u) the procedure of General To Specific (GTS) is utilized. For instance, the optimal lagged model is ARDL (1,1,1,1,1,1) therefore, the ARDL representation of equation (1) is written as follow [37]:

$$SR_t=\mu_t+\beta SR_{t-1}+\delta_1 G_t+\delta_2 G_{t-1}+\delta_3 SI_t+\delta_4 SI_{t-1}+\delta_5 IS_t+\delta_6 IS_{t-1}+\delta_7 EX_t+\delta_8 EX_{t-1}+\delta_9 OP_t+\delta_{10} OP_{t-1}+\varepsilon_t \quad (3)$$

And (ECM) equation which represents the short-run error-correction model is demonstrated as follows:

$$\Delta SR_t=\beta_0+\sum_{i=1}^{p}\beta_i\,\Delta SR_{t-i}+\sum_{j=0}^{q}\gamma_j\,\Delta G_{t-j}+\sum_{k=0}^{r}\delta_k\,\Delta SI_{t-k}+\sum_{m=0}^{s}\eta_m\,\Delta IS_{t-m}+\sum_{n=0}^{v}\theta_n\,\Delta EX_{t-n}+\sum_{o=1}^{w}\tau_o\,\Delta OP_{t-o}+\varphi Z_{t-1}+e_t \quad (4)$$

In the above equation (4), p, q, r, s, v and w refer to the optimal lag of the model which was selected based on Schwarz Bayesion Criterion (SBC) because it is more consistent than Akaike Information Criterion (AIC) as argued by Ricky and Law and Lutkepohl. φrefers to the short-run equation which includes ECT that examines the speediness of adjustment of the short-run deviation to the long-run equilibrium [38].

Whereas, Whereas, $Z_{t-1}=SR_{t-1}-\alpha_0-\alpha_1G_{t-1}=\alpha 2SI_{t-1}-\alpha 3IS_{t-1}-\alpha 4GEX_{t-1}-\alpha 5OP_{t-1}$

or the (ECT) error correction term and αs that represents the Ordinary Least Squares (OLS) estimates of the αs in equation (4).

Then, the long-run coefficients can be computed based on the model above ARDL (1,1,1,1,1,1). Assuming that the coefficients of long-run depend on the ARDL lag structure which means various lags leads different specifications of the model and obtain diverse long-run elasticity equations

$$\varphi_G=\frac{\gamma_1+\gamma_2}{1-\beta_1} \quad \varphi_{SI}=\frac{\delta_1+\delta_2}{1-\beta_1} \quad \varphi_{IS}=\frac{\eta_1+\eta_2}{1-\beta_1} \quad \varphi_{EX}=\frac{\theta_1+\theta_2}{1-\beta_1} \quad \varphi_{OP}=\frac{\tau_1+\tau_2}{1-\beta_1}$$

Additionally, the equation error term will be the error-correction term after getting the equation of the long-run. The changes (Δ) of SR represents the dependent variable for the short-run [40].

The dependent variable for the short-run is changes (Δ) of RGDPC, and all the explanatory variables as well as in all changes. The equation of short-run can be written as follows:

$$\Delta SR_t=\alpha+\sum_{i=1}^{p-1}\alpha_i\,\Delta SR_t+\sum_{j=0}^{q-1}\alpha_j\,\Delta G_t+\sum_{k=0}^{r-1}\delta_k\,\Delta SI_t+\sum_{m=0}^{s-1}\alpha_m\,\Delta IS_t+\sum_{n=0}^{v-1}\alpha_n\,\Delta EX_t+\sum_{o=1}^{w-1}\alpha_o\,\Delta OP_t+ECT_{t-1}+e_t \quad (5)$$

The procedure of bound test is based on F-test that examines the hypothesis of no cointegration between variables versus the alternative hypothesis of the presence of cointegration between variables. In this study two critical values generated by Narayan were employed since the F-test has non-standard distribution. The critical lower bound suggests all variables are I(1) which means variables are not cointegrated, whereas the critical upper bound assumes that all variables are I(1) which indicate the presence of cointegration among the variables. Thus, the null hypothesis of no cointegration will be rejected if the F-calculated is greater than critical upper bound, indicating that the variables are cointegrated. However, the no cointegration hypothesis cannot be rejected if the F-calculated is less than the critical lower bound. Lastly, the results can be inconclusive if the F-computed is between lower and upper bound [41].

Data: This study employs daily time series data spanning from 24 February 2020 to 12 February 2021 with 354 observations. The data of this study were collected from three main sources. First, daily data of stock market return and exchange rate were obtained from This study chooses Bahrain All shares as a major stock index in Bahrain. Second, daily data of COVID-19 confirmed cases and Stringency index were collected from Oxford COVID-19 Government Response Tracker (OxCGRT) database. Third, daily data of oil price were collected from OPEC website [42].

In this research, the return on the stock market is measured as the daily change in Bahrain All shares index. Specifically, it was calculated by the author using this formula.

Index value$_t$-Index value$_{t-1}$ /Index value$_{t-1}$

The daily growth rate of COVID-19 confirmed cases in Bahrain used as a proxy for the growth in confirmed cases which was calculated by the author through this formula:

Confirmed cases$_t$-Confirmed cases$_{t-1}$/confirmed cases$_{t-1}$

The stringency index refers to the social distancing measures announced by Bahrain government for instance: Closure of work places, schools and public places in addition to the restrictions on international and internal travel. This variable determines the stringency of governmental physical distancing policies which leads to a decline in the stock market returns due to its adverse economic effect. The income support involves the government financial support to households, directly by transferring cash or relief in debt or covering some utilities' taxes like electricity. Thus, stock returns can be affected by income support programs through decreasing the infection rates as a result of the higher compliance with the measures of social distancing. Because income support is widely supplied to poor people in the society, so more income support programs can reduce the infection rates through encouraging individuals to stay at home. In the same line, recent researchers argued that compliance with orders for staying at home significantly differs with income that means groups of lower income have more chances to be exposed to the virus and less likely to follow the government orders. Hence, announcing the income support programs from the government lead to weaken the negative reaction of stock market return to the growth in confirmed cases of COVID-19 [43].

The exchange rate variable is the needed amount of Bahraini Dinars to get one unit of USD. This variable is involved in our model due to its crucial role in the performance of stock market. The

depreciation of exchange rate gives more chances for exporting goods and services that leads to increase investment and foreign capital inflow that reflects on the economic performance of the country. Whereas the oil price was measured by U.S. dollars per barrel. The oil price and its impact on the stock market returns has been receiving enormous attention from scholars for last many years. This is because the fall and rise in oil prices will cause fluctuations in the stock market returns. Thus, rising in oil prices will have a bearing on the production of the oil-based companies which in turn leads to a decline in share prices and return for investors.

Tables 1 and 2 demonstrate the descriptive statistics and correlation matrix respectively. From Table 2, it can be seen that the stock return has a positive relationship with Stringency index, Income support and oil price. Whereas, the Growth in confirmed cases and exchange rate are negatively associated with the stock return.

Variable	Observations	Mean	Std. Dev	Min	Max
Stock return	354	-0.00035	0.00619	-0.0582	0.0245
Growth in confirmed cases	354	0.087715	1.16938	0	22
Stringency index	354	62.1943	12.1275	25	78.7
Other control variables					
Income support	354	1.79154	0.60535	0	2
Exchange rate	354	0.37706	0.00049	0.376	0.3793
Oil price	354	40.1175	11.142	12.22	62.61

Note: All statistics are based on original data values.

Table 1. Descriptive statistics.

	SR	G	SI	IS	EX	OP
SR	1.0000					
G	-0.0232	1.0000				
SI	0.2282	-0.2360	1.0000			
IS	0.2883	-0.2434	0.5362	1.0000		
EX	-0.0991	0.0554	0.3568	-0.1303	1.0000	
OP	0.1009	0.0042	-0.4812	0.0950	-0.7203	1.0000

Note: SR: Stock Return; G: Growth in confirmed cases; SI: Stringency Index; IS: Income Support; EX: Exchange Rate; OP: Oil price

Table 2. Correlations.

Results and Discussion

Empirical result: Table 3 summarizes the results of unit root tests based on the Augmented Dickey Fuller (ADF) and Philip Perron (PP) tests. As Table 3 shows, both ADF and PP test statistics are highly significant at 1% level for most variables which indicate that some variables are stationary at level but other variables are stationary at first-difference. Hence, all variables are integrated of order one, that is I (1) or I (0). Therefore, the finding fulfills the ARDL bounds test criterion of no variable is integrated of order two or I (2).

Variable	ADF		PP	
	Level	First difference	Level	First difference
SR	-17.3553 ***	-14.29 ***	-18.3064 ***	-99.8106 ***
G	-4.5109 ***	-10.56 ***	-87.1022 ***	-720.3822 ***
SI	-4.4426 ***	-19.56 ***	-4.4523 ***	-19.5589 ***
IS	-2.6589	-18.84 ***	-2.6591	-18.8405 ***
EX	-7.377 ***	-14.07 ***	-10.2024 ***	-68.2297 ***
OP	-3.2608	-17.71	-3.2636	-17.8385
	*	***	*	***

Notes: *, ** and *** indicate significance at 10% level, 5% level and 1% level respectively.

Table 3. Unit root tests (ADF and PP).

The empirical results of bound test and the ARDL estimation and diagnostic checks are presented in Table 4. This estimation employed the SBC lagged length selection criterion. The calculated F-statistics is greater than the upper bound critical value at all significance levels. Hence, no co-integration hypothesis is rejected which indicates that there is a co-integration relationship between the variables included in our model as presented in equation (1).

Table 4 reports the long-run and short-run coefficients as well as the error-correction terms for model 1 and 2 in equation 1 and 2 respectively where the long-run estimation is the main results. Based on the estimated results of ARDL, in model 1, this research provides empirical evidence on the negative relationship between growth in confirmed cases and stock market return in the long-run in Bahrain. This result is statistically significant at conventional level (5%) which indicates the strong reaction of stock markets towards the COVID-19. Significant result suggests that a 1 percentage point increase in growth in confirmed cases, on average, causes the stock market return to be diminished in the long-run by -0.0322 percentage points in Bahrain. Our findings support the outcomes of prior studies and validate our model for further analysis. In the same model (1), the stringency index variable appears positive and significant at 5%. This reflects the extent to which stock markets reacted positively to government policies in terms of social distancing measures. The result suggests that the social distance policies did not impact negatively the performance of Bahrain stock markets. Regarding the control variables, like income support, exchange rate and oil price have positive coefficients but statistically not significant in the long-run.

While this evidence may not be adequate given the nature of our arguments and econometric specification, it provides groundwork to examine the impact of the interaction term between the growth in confirmed cases and stringency index on stock market return. The following section satisfactorily examines this relationship and provides reasonable and convincing economic interpretation.

Accounting for the interaction impact of the growth in confirmed cases and stringency index on stock market return on financial development: In Table 4, model 2 an interaction term between the growth in confirmed cases and stringency index was introduced in order to check whether the degree of stringency index explains the negative impact of the growth in confirmed cases on the stock market return in Bahrain. In other words, the interaction term can be interpreted as the long-run marginal impact of growth in confirmed cases on stock market return depending on the degree of stringency index in Bahrain. Again, the long-run impact of growth in confirmed cases on stock market return was found to be negative but statistically significant at 10% under ARDL estimation.

Going straight to the variable of interest, the coefficient of the interaction term has positive sign but not significant which means the relationship between the growth in confirmed cases and stock market return do not depend on the level of stringency index. This outcome suggests that the adverse effect of growth in confirmed cases on stock market returns do not dampen with further stringent social distancing policies. Therefore, our findings imply that government interventions impact related to stringency index is not channeled *via* the drop in confirmed cases. Our finding is in line with Ashraf, Shanaev and Zaremba that demonstrated that undertaken social distancing measures by the government have indirect beneficial economic impact through the channel of decreasing the COVID-19 outbreaks intensity. Therefore, markets will overreact as more variables and information become available and with any unexpected news where people understand the ramifications more broadly the market corrects itself.

Concerning the control variables in this model (2), exchange rate has a negative sign but insignificant whereas income support was found to have positive and statistically significant in the long run at 10%. This suggests that Bahrain stock markets react positively towards the government action as income support by improving the confidence of investors and decreasing the adverse economic impacts caused by COVID-19. Additionally, oil price coefficient is positive and significant at 10%. Our results showed that oil price affects the Bahrain stock markets positively. This outcome suggests that Bahrain stock market is very sensitive to the oil price due to its high dependence on oil revenues. Furthermore, this study also examined the short-run impact of government intervention on stock market return during the period of COVID-19. Empirical results showed that most variables are not significant including the main variable of this study.

Finally, in order to make sure that our model is the appropriate one, diagnostic tests were performed, for instance LM test for testing serial correlation and the structural break test (CUSUM). Therefore, it can be concluded that based on the results of these diagnostic test, the estimated models are well specified. Figure 3 of CUSUM stability test for model (1) and model (2) can be found in the Table 4.

	Model 1	**Model 2**
Long-run		
Selected model	(3, 2, 2, 0, 0, 2)	(4, 4, 2, 0, 0, 0, 1)
Constant	0.2695 (0.0793)***	0.2686 (0.0764)***
G_t	-0.0322 (0.0132)**	-0.0328 (0.0190)**
S_{it}	0.0024 (0.0012)**	0.0028 (0.0011)**
IS_t	0.0016 (0.0013)	0.0025 (0.0013)**
Ex_t	-0.0834 (0.1858)	-0.0792 (0.1792)

Op_t	0.0005 (0.0008)	0.0015 (0.0008)*
$(G\times SI)_t$		0.0852 (0.0659)
Short-run		
ΔSR_{t-1}	-0.1146 (0.0783)	-0.0436 (0.0927)
ΔSR_{t-2}	0.1317 (0.0561)**	-0.0366 (0.0770)
ΔSR_{t-3}		0.0911 (0.0557)
ΔG_t	0.0024 (0.0068)	0.0056 (0.0091)
ΔG_{t-1}	0.0247 (0.0058)***	0.0187 (0.0078)
ΔG_{t-2}		-0.0173 (0.0062)***
ΔG_{t-3}		0.0025 (0.0012)**
ΔS_{lt}	0.0013 (0.0033)	0.0014 (0.0033)
ΔSI_{t-1}	0.0161 (0.0033) ***	0.0015 (0.0033) ***
ΔOP_t	0.0058 (0.0036)	
ΔOP_{t-1}	0.0059 (0.0036)	
$\Delta (G\times SI)_t$		0.0047 (0.0419)
Diagnostic results		
ECT_{t-1}	-0.9239 (0.0949)***	-0.9633 (0.1037)***
F-statistic	13.2943***	10.5735***
Adjusted R^2	0.5655	0.5732
LM	1.1166	4.7934
CUSUM	Stable	Stable
	F-test bounds critical value for n=1, k=5, Case 2 (for k=6)	
	10% 5%	1%
Lower bound	2.303 (2.088) 2.550 (3.606)	3.351(3.173)
Upper bound	3.154 (3.103) 3.606 (3.518)	4.587(4.485)

Note: The corresponding standard error is given in (…). *, ** and *** indicate significant at 10% level, 5% level and 1% level respectively.

Table 4. Estimated results for ARDL models.

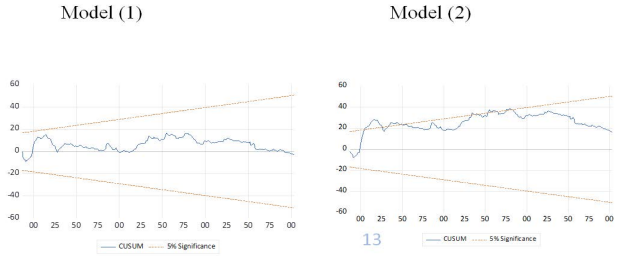

Figure 3. CUSUM stability test for model (1) and model (2).

Conclusion

The objective of this paper is to examine empirically the impact of government interventions like measures of social distancing on Bahrain stock market return during COVID-19. Employing the procedure of Autoregressive Distributed Lag (ARDL) bounds test, this study tested the evidence of long-run and short-run impact of government interventions on the stock market in Bahrain. The study used daily data of stock market return, growth in confirmed cases in COVID-19 and policies of Bahrain government during the period February 24, 2020 to February 12, 2021. Empirical results demonstrated the negative relationship between growth in confirmed cases and stock market return in the long-run in Bahrain. This suggests the strong negative reaction of stock market return towards the COVID-19 disease. Regarding the interaction term between growth in confirmed cases and stringency index, results reveal that government interventions regarding social distance policies like school closing, workplace closing, restriction on internal movement, and international travel etc,. had positive but statistically insignificant impact on stock market return. This implies that the impact of government interventions linked to stringency index (social distance policies taken by Bahrain government) is not channeled through the declining of growth in confirmed cases.

The present research outcomes give valuable insights to policymakers, investors, and financial authorities to inform their decisions. This is through managing the adverse impact of COVID-19 disease on the stock markets in Bahrain. Lastly, more analysis is needed to understand the impact of COVID-19 on the stock market return in Bahrain by investigating the conditional effect between measures of COVID-19 and income support and volatility in the global oil market. Furthermore, assessing the impact of COVID-19 on Bahrain stock market return at the firm level is needed in order to determine which sector is more affected.

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How to cite this article: Chebab, Daouia, Mustafa Raza Rabbani and Chan-Fatt Cheah. "The Nexus between COVID-19, Government Intervention and Stock Market Returns: Evidence from Kingdom of Bahrain." *Arabian J Bus Manag Review* 13 (2023): 467.