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COVID-19 AND TWO DIFFERENT STOCK MARKETS: AN EVENT STUDY ANALYSIS

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ABSTRACT

In this study, we examine two different stock markets' response to the COVID-19 pandemic using event study methodology and a novel linear regression model. We use LSE (UK) as a proxy for the developed countries stock market and DSE (Bangladesh) as a proxy for the developing countries stock market. Using the daily COVID-19 confirmed cases and deaths and stock market returns data from these two countries (UK and Bangladesh) over the period November 01, 2019 to August 07, 2020. Our main research question was, which stock market suffered more during the COVID-19 pandemic, whether developed countries stock market or developing countries stock market. We find that developed countries stock markets (LSE as proxy) responded negatively to the growth in COVID-19 confirmed cases and deaths in COVID-19. We further find that developing countries stock markets (DSE as proxy) did not responded to the growth in COVID-19 confirmed cases and deaths in COVID-19.

Highlights:

1. In this study we examine two different stock market's response to the COVID-19 pandemic, in here we use event study methodology.
2. We use the daily COVID-19 confirmed cases and deaths and stock market returns data from these two countries (UK and Bangladesh).
3. We find that developed countries stock markets (LSE as proxy) responded negatively to the growth in COVID-19 confirmed cases and deaths in COVID-19.

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Key words: Pandemic, COVID-19, Event study, LSE, DSE

JEL Classifications: E2, E6, E44, E49, G14,

1 INTRODUCTION

The SARs-CoV-2 virus spread from Wuhan, China in late 2019. The origins of the virus remain unclear and various speculations have led to a confusion on the cause and spread of the virus. The virus later turned into a pandemic as declared by WHO in March 2020 (Chakraborty et al., 2020). This outbreak is famously referred to as the COVID-19 pandemic. At the time of writing there is over 23 million cases, and just over 800,000 deaths worldwide (Worldometers, 2020). Different regions of the world were affected differently, there are speculations on how the response measured from the governments after the initial outbreak of the virus (Khan & Naushad, 2020). There has been a debate on how prepared countries were in combating such an outbreak. Furthermore, there was a growing consensus in the post SARS and MERS period that there is a high likeliness of a viral outbreak earlier in the decade (Kannan et al., 2020). A study conducted by the UK government had expected there was a high risk of a viral outbreak, yet the preparedness of the government was questionable (UK Cabinet Office, 2008). Arguably certain developing countries in western Europe and the United States were not prepared and respond efficiently to the COVID-19 outbreak (Kannan et al., 2020).

This study will look at only the stock exchange as it is the most readily available data, compared to official GDP calculations or levels of unemployment and other economic indicators. The stock market data are updated daily on an hourly basis this gives an accurate portrayal of a segment of the economy. There are some downsides to looking at solely at the stock market, it does not include the effects of the public sector, SMEs outside of the stock exchange, and the energy sector. These are some of the most vital aspects of an economy. However, the effects on the stock exchange does display the effects on the economy of a certain crisis, in this case the coronavirus outbreak.

The COVID-19 pandemic had visible effects on the financial markets of the developed countries (Baker et al., 2020). Due to the lockdowns, businesses were forced to shut down and trading was significantly reduced. This particularly caused the stock markets to experience a slump (Baker et al., 2020). In this study we have selected *United Kingdom* as a proxy for developed country and *Bangladesh* as a proxy for developing country. We have selected the top performing companies from their respective stock exchanges. From the UK's London Stock Exchange [LSE- from here on] FTSE-100 and DSE-30 from Bangladesh's Dhaka Stock Exchange [DSE- from here on]. In the data analysis segment regressions has been set up to analyse the impacts of COVID in each of these markets and the performances of their companies.

This study will primarily focus on the effects of COVID-19 on two of the chosen stock markets, the effects on a developed and a developing country's markets. We have selected the London Stock Exchange and the Dhaka Stock Exchange as the primary two markets in this research. In this study, we use even study methodology and a novel linear regression model to answer the research question. Our main research question is, which stock market suffered more during the COVID-19 pandemic, whether developed countries stock market or developing countries stock market. From our result we can see that, the developed country has significantly been affected by the stock market and as the developing country's economy is yet to be fully financialised the effects of the pandemic may not reflect the same way. Furthermore, during the great recession the Dhaka Stock Exchange did not experience significant recessions or slumps like the developed stock exchanges, due to the lack of interconnectedness with the international market (Ali et al., 2011; Mader, 2015)

This study will contribute to the literature in the following ways: (1) from the previous literature on this matter we can see that, previous researchers have tried to discover the effects of COVID-19 on DSE, and they revealed the pandemic had a negative effect on the performance of the market (Ashraf, 2020). In that analysis a simple linear regression model was utilised, in our paper we attempt to use an event study methodology to find more details. Furthermore, they used 12 observations from the DSE, this unfortunately does not represent an overall overview of the DSE. We will be taking the DSE 30 companies [includes 30 best companies in the market], this will enhance the statistical accuracy of our analysis; (2) from previous literature (Bash, 2020) we can see that they use event study methodology to find out how LSE (FTSE 100) react during COVID-19, and they found react more negatively. In their research they use only event study methodology, but in our study, we also use a novel model specification. On the other hand, they had less observation for LSE, which means their results was statistically less strong, but we have more observations than they had; and (3) this paper intends to demonstrate the differences in effects of the COVID-19 on a developing and a developed country's stock markets. This will help us demonstrate the differences and similarities of the effects.

The rest of the paper is organised in the following way. Section 2 provide the related literature review. Section 3 where we have showed our methodology and data. Section 4 describe our main empirical results and discussion. Finally, in section 5 we have provided conclusion of this paper.

2 LITERATURE REVIEW

In this paper, the primary stock exchange of Bangladesh and the United Kingdom has been chosen. The London Stock Exchange is the primary stock exchange in the United Kingdom, as of April 2018 the total market capitalisation

was an estimated $4.59 trillion (ROInvesting, 2020). While Dhaka Stock Exchange is the primary stock exchange of Bangladesh, as of 2015 estimation the total market capitalisation was around $40 billion[1]. The two countries are very different in its overall economy and the level of financialisation (Ali et al., 2011; Mader, 2015; Guschanski & Onaran, 2018). Bangladesh being largely a primary based economy on its way to industrialisation (Karmakar, 2008), while the United Kingdom is a tertiary based economy in its post-industrial stage (Source). The size of the economy of these two countries are distinct and that is represented in the size of the market cap of the two premier stock exchanges (Martin et al., 2016).

The COVID-19 lockdowns had severe effects on both stock exchanges, also, both countries had a similar pattern of COVID-19 cases with respect to the size of their populations. Both countries had reached its peak and the cases have somewhat stabilised (Worldometers, 2020). Therefore, to explore the different effects of the pandemic on a developing and a developed economy the selection of these two countries will provide a productive comparison. The paper of Ashraf, (2020) included some interesting point of view, the conclusion mentioned that there was a correlation between the number of cases and the effects on the stock market in the selected countries and not the death caused by the virus. This explains that there was a large hysteria surrounding the virus outbreak and that significantly impacted the performances of the selected country's stock markets.

The term 'lemon's problem' – the 'asymmetric information possessed by the buyer and the seller' causes the market to spread panic ridden consequences. This was one of the fundamental reasons according to the Ashraf, (2020) paper that caused the financial markets to underperform in the first few months of the pandemic. The Market for 'Lemons': Quality Uncertainty and the Market Mechanism written by George A. Akerlof in the 1960s specifically discussed this issue of asymmetric information biases and how that impact the entirety of the market. The theory of 'lemon's problem' emerged from this paper and this is further established in the COVID-19 era stock market. Additionally, the paper uses data collected from 64 countries and attempts to illustrate the effects of the virus on each of the countries' stock markets.

The paper of Griffith et al., (2020) further delves into the reactions in the London Stock Exchange. They have divided up the different companies into industry-based categories the performances based on their relative industry. The paper uses share prices to convey the future profitability according to market expectations on the firms that were studied. The study suggests that COVID-19 effects on the share prices reflect the market expectations, such as effects on the demand for shares, the products they offer and the supply chain. These observations make the paper credible in understanding the market effects of the pandemic in different industries. From the Griffith et al., (2020)

[1] https://www.ceicdata.com/en/bangladesh/dhaka-stock-exchange-market-capitalization

paper it is evident that the leisure and tourism industries were affected the most along with banking, financial services, retailers, energy sector and distribution. On the other hand, some industries have outperformed, the tobacco, alcohol, high-tech manufacturing, and food industries did well. These only reconfirm the theories of crisis and market behaviour (Detzer, 2014).

The Topcu and Gulal, (2020) paper investigates the effects of the pandemic on emerging markets in Asia and Europe. The paper categorised in regional sections; it was revealed that due to the low effects of the virus in eastern Europe the financial repercussions were also minimal. Furthermore, this paper investigates the stimulus packages provided by the selected governments. They have utilised '*Driscoll-Kraay*' estimator to find out the negative and statistically significant impacts of the virus on the emerging stock markets. The paper however, only focused on a 40-day period. It would be interesting and more statistically stimulating to see the period extended to a few months or at least after the peak of the viral outbreak. The paper concluded that the emerging markets experienced significant negative impacts in March, however, as the period was extended to April, the effects were not substantial enough. This may suggest that the coronavirus outbreak in the emerging markets were not enough in that period. It would be one of the aims of our paper to discover the effects in the longer run until August, 2020.

3 METHODOLOGY AND DATA

3.1 METHODOLOGY

3.1.1 MARKET MODEL

we calculate abnormal returns ($AR_{i,t}$) using market model methodology as in Dodd and Warner (1983) and Brown and Warner (1985).

The raw returns are calculated as follows:

$$R_{i,t} = \ln(P_{i,t}) - \ln(P_{i,t-1}) \quad (1)$$

where $R_{i,t}$ is the actual return (this is not adjusted for dividend) on stock i from day t-1 to t, $P_{i,t}$ is the price of stock i on day t and $P_{i,t-1}$ is the price of stock i on day t-1. We compute abnormal stock returns for each day of the event window as the difference between the actual return and the stock's expected return in the absence of the event, according to the following equation:

$$AR_{i,t} = R_{i,t} - E(R_{i,t}) \quad (2)$$

where $AR_{i,t}$ is the abnormal returns on stock i from day t-1 to t, $R_{i,t}$ is the actual return on stock i on day t, and $E(R_{i,t})$ is the expected returns on stock i on day t. We use the market model to estimate expected stock returns, where the

parameters α and β are estimated by OLS using 239 daily returns observations prior to the event window (from t-250, to t-11):

$$E(R_{i,t}) = \alpha_i + \beta_i R_{m,t} + \mu_{i,t} \quad (3)$$

where $E(R_{i,t})$ is the expected returns on stock i on day t. $R_{m,t}$ is the market portfolio returns on day t proxied by the market index (DSE-30 and FTSE-100). $\mu_{i,t}$ is the random error term and α_i and β_i are the market model parameters.

Then daily abnormal returns are averaged across the portfolios of firms:

$$AR_{p,t} = \frac{\sum_{t=1}^{N} AR_{i,t}}{N} \quad (4)$$

where $AR_{p,t}$ is the weighted average portfolio abnormal return.

Then we cumulate the $AR_{i,t}$ over a particular time interval and I obtain cumulative abnormal returns (CAR) as:

$$CAR_{it} = \sum_{t=1}^{k} AR_{i,t} \quad (5)$$

where k in the number of days to be cumulated over the event window. We use CAR as a measure of the market reactions COVID-19 event day.

3.1.2 IDENTIFICATION OF THE EVENT PERIOD

The COVID-19 is a kind of pandemic in where a series of evolving events are involves. In this study we will follow Ru et al. (2020) approach, where they use only one specified event. Through some of the studies (including Khunthavit, 2020) use event period covering all the COVID-19 events related to the sample market. In this study our first event as when the specific country had their first COVID-19 confirm patient, Table 1 covers all COVID-19 events relevant to the sample markets. The event days are the corresponding occurrence days. If, however, the occurrence days are holidays on which the markets were closed, then the event days are the following trading days (Ahmed, 2017).

Table 1. Stock Market Indices and Event Days for Bangladesh and the UK with the Most Registered Cases as of 7 August 2020

Country	Stock market index	First registered case (Event day)
Bangladesh	DSE-30	March 08, 2020
United Kingdom	FTSE-100	January 31, 2020

3.1.3 LENGTH OF THE PRE- AND POST- EVENT PERIOD WINDOW

The AR usually engross all the effects of all economic and noneconomic events that are not interesting to the study, if the pre-event period window is long enough (Nazir, Younus, Kaleem, & Anwar, 2014). On the other hand, if the pre-event period window is short, then the study will not be able to analyse the effects of the first event. This study chose a 11-day pre-event period window because it is the shortest length for a window typically chosen in event studies. As a result, t = −11. The post-event-period window is also 11 days long. This window runs from days t-250 to t-11. Altogether, we have event window of 239 days. In this study we computes the AR for 5 different event windows, which are: [0,+1]; [–1,+1]; [–5,+5]; [–10,+10] and [–20,+20].

3.1.4 LINEAR MODEL SPECIFICATION

Our main model specification is:

$$CAR_{i,t}^{[event\ window]} = \alpha_{i,t} + \beta_1 COVID{-}19_{Patient} + \beta_2 COVID{-}19_{Death} + \gamma_1 Size_{it} + \varphi_1 Patient_{Dummy} + \varphi_2 Death_{Dummy} + \varepsilon_{i,t} \quad (6)$$

In here, CAR = Cumulative abnormal return. $COVID{-}19_{Patient}$ = The daily growth of the confirm patients. $COVID{-}19_{Death}$ = The daily growth of the confirm death. Size = Firm size, which is measured using the logarithmic market capitalization. $Patient_{Dummy}$ = If confirm COVID-19 patient number is more than or equal 2,000 then it takes 1, other wise 0. $Death_{Dummy}$ = If confirm COVID-19 death number is more than or equal 30 then it takes 1, other wise 0. $\varepsilon_{i,t}$ = Error term

3.2 DATA

3.2.1 SAMPLE SELECTION

We started our data collection by collecting the data of the number of confirmed cases and deaths from COVID-19 from the website of John Hopkins University (JHU)' Coronavirus Resource Centre and from Worldometers[2] website. This data is available for more than 200 countries and territories, which have been affected be the COVID-19 till the day we downloaded data. Our data starts from 1st November 2019 till 7th August 2020. After that we downloaded daily stock market return for both countries (Bangladesh and United Kingdom) from

[2] https://www.worldometers.info/coronavirus/

investing[3] website and from ROinvesting[4] website. We used DSE-30 for Dhaka Stock Exchange (DSE, Bangladesh) and FTSE-100 for London Stock Exchange (LSE, UK). Lastly, we collect market capitalizations for each of the company for both countries, from investing and ROinvesting websites.

3.2.2 SUMMARY STATISTICS

Table 2 shows the summary statistics of both stock exchanges. Table 2 shows that DSE has 1,805 observations and LSE has 11,659 observations. In Bangladesh COVID-19 growth of confirmed cases mean value is 0.00049, on the other hand UK COVID-19 growth of confirmed cases mean value is 0.07482. The difference between maximum value of size in both stock markets are vary narrow, in DSE-30 is 21.97395 and in FTSE-100 is 25.49877, though FTSE-100 is way larger than DSE-30. One of the main reasons behind this narrow difference may be, because in the COVID-19 period, LSE heat hard in the first couple of months after announcing their first COVID-19 case. Another reason could be DSE-30 is small compare to FTSE-100, so if DSE-30 listed companies lost their market value it will have less effect on their size but on the other hand, if FTSE-100 listed companies lose their market value it will have more effect on their size.

Table 3 reports the Pearson correlations between main variables. Daily growth in COVID-19 confirmed deaths has strong positive correlation with daily growth in COVID-19 confirms cases.

4 EMPIRICAL ANALYSIS AND DISCUSSIONS

Table 4 present descriptive statistics for the CAR [0, +1]; [–1, +1]; [–5, +5]; [–10, +10] and [–20, +20], for both indices (DSE-30 and FTSE-100). We can see that DSE distribution is more positively skewed except CAR [–20, +20] following the event day, indicating the existing of extreme positive value and on the other hand, LSE distribution is negatively skewed following the event day, indicating the existing of extreme negative value. Besides, if we look at the kurtosis value in both stock exchange then we can see that the distribution is leptokurtic, which means that there is presence of extreme outlier values.

Though we have calculated CAR for five different windows, but in here we are showing regression results based on equation-6 for only CAR [–5, +5] and CAR [–20, +20]. But we also run the regressions for other three windows, but the results are not showing here[5].

First, we used the CAR for an 11-days window periods surrounding the event days, which means 5 days before and 5 days after the event days and 1

[3] www.investing.com

[4] https://www.roinvesting.com/en/indices-articles/ftse-100-list

[5] Regression results for CAR [0, +1]; [–1, +1] and [–10, +10] are available on request.

Table 2. Summary Statistics

	Dhaka Stock Exchange					London Stock Exchange				
Variable	**Obs.**	**Mean**	**Std. Div.**	**Min**	**Max**	**Obs.**	**Mean**	**Std. Div.**	**Min**	**Max**
Growth in confirmed cases	1,805	0.00049	0.18819	0	0.25	11,659	0.07482	0.12815	0	0.57971
Growth in death	1,805	0.03711	0.07803	0	0.50	9,435	0.07778	0.17	0	1.33333
Size	1,805	19.31903	0.95848	17.75320	21.97395	11,659	23.09246	0.95220	21.28208	25.49877
Patient Dummy	1,805	0.79169	0.40621	0	1	11,659	0.29788	0.45736	0	1
Death Dummy	1,805	0.79391	0.40461	0	1	11,659	0.65657	0.47487	0	1

Note: This table reports the summary statistics of main variables. Growth in confirmed cases is measured as the daily growth in COVID-19 confirmed cases in a country. Growth in deaths is measured as the daily growth in the number of COVID-19 patients died. Size is logarithmic market capitalization. $Patient_{Dummy}$ = If confirm COVID-19 patient number is more than or equal 2,000 then it takes 1, other wise 0. $Death_{Dummy}$ = If confirm COVID-19 death number is more than or equal 30 then it takes 1, other wise 0.

Table 3. Correlations Matrix

	Dhaka Stock Exchange					London Stock Exchange				
Variables	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**
(1) Growth in confirmed cases	1.0000					1.0000				
(2) Growth in deaths	0.1782*	1.0000				0.6753*	1.0000			
(3) Size	0.0029	−0.0013	1.0000			0.0000	0.0000	1.0000		
(4) Patient Dummy	0.2366*	−0.3565*	0.0125	1.0000		−0.0972*	0.0377*	0.0003	1.0000	
(5) Death Dummy	0.2266*	−0.3861*	0.0044	0.8145*	1.0000	−0.4141*	−0.2656*	0.0002	0.4711*	1.0000

Note: This table reports the pairwise Pearson correlations between main variables. Growth in confirmed cases is measured as the daily growth in COVID-19 confirmed cases in a country. Growth in deaths is measured as the daily growth in the number of COVID-19 patients died. Size is logarithmic market capitalization. $Patient_{Dummy}$ = If confirm COVID-19 patient number is more than or equal 2,000 then it takes 1, other wise 0. $Death_{Dummy}$ = If confirm COVID-19 death number is more than or equal 30 then it takes 1, other wise 0.

Table 4. Descriptive Statistics for Cumulative Abnormal Returns (CAR)

	Dhaka Stock Exchange				London Stock Exchange			
	Mean	**Median**	**Skewness**	**Kurtosis**	**Mean**	**Median**	**Skewness**	**Kurtosis**
[0, +1]	0.00008	0.00006	0.21088	1.66360	−0.00372	−0.00129	−1.90475	10.93067
[−1, +1]	0.00008	0.00007	0.19499	1.74124	−0.00369	−0.00129	−1.89432	10.87893
[−5, +5]	0.00007	0.00006	0.13169	2.04187	−0.00358	−0.00129	−1.85382	10.67646
[−10, +10]	0.00007	0.00006	0.05237	2.39797	−0.00344	−0.00105	−1.80582	10.43307
[−20, +20]	0.00005	0.00003	−0.11120	3.05861	−0.00269	−0.000512	−1.72860	10.00459

Note: Descriptive statistics for cumulative abnormal returns (CAR).

event day. Even though, we know that, the length of period is short, but many other relevant studies used these-11 days window, including Ru et al. (2020) and Khanthavit (2020). Their argument was, some events lie close to each other, the 11-day window may be mitigating the problems caused by having overlapping-windows.

In Table 5 we can see that, growth in confirmed cases variable enters negatively and significant at 10% level in Model 1 for DSE, which suggest that stock market response negatively to the growth of COVID-19 confirmed cases. But the results are not consistent when we add Size and other two dummy in Model-4 and 5, in that case results are not statistically significant. Similar kind of pattern we can observe for growth in deaths for DSE.

But our results are completely opposite for LSE in Table 5. For LSE growth in confirmed COVID-19 cases variable negatively and strongly significant (at 1% level) for all four models

(Model-1, 3, 4 and 5). Similar Kind of results we can see for growth in death for all four models (Model-2, 3, 5 and 5 for LSE.

After that we run regression using CAR [–20, +20], which means 20-days before and 20-days after the event day and 1 event day, in total 41 days. Because this is the shortest length for window typically chosen in the event studies (Peterson, 1989). When, we use Equation-6 and CAR [–20, +20], our results suggest nothing different than what we have found when we used CAR [–5, +5].

Together from these results we can suggest that stock market respond negatively and overwhelmingly to the growth in the number of confirmed COVID-19 cases and growth in COVID-19 deaths for LSE, which is developed economy market. But on the other hand, for DSE stock market, which is developing economy market respond negatively but not statistically significantly for both growth in confirmed COVID-19 cases and growth in COVID-19 deaths.

Our main research question is which stock market suffered more during the COVID-19 pandemic, whether developed country stock market or developing country stock market. The results above suggest that developed countries stock market like LSE had suffered more during the COVID-19 Pandemic compare to developing countries stock market like DSE. This result is not beyond expectation. The spread of COVID-19 and international measures to contain it having a major impact on LSE than DSE.

We all know that share price not only tell us how well a company is doing today but also informed us how well the company will do in future. Because stock price not only reflect how much dividend a company currently paying, but also it tells investors how much dividend they will get in future. If investors believe that they will get more dividend in future, then they will invest more in that company and share price will increase. But on the other hand, if investors worried about the future profitability of the company, then its share price will fall. LSE is large in terms of company capitalisations but on the other hand DSE very small in terms of market capitalisations, that's why when market

Table 5. Impact of COVID-19 on Stock Market Using CAR [–5, +5]

	Dhaka Stock Exchange					London Stock Exchange				
Variables	**CAR[–5, +5]**									
	Model-1	**Model-2**	**Model-3**	**Model-4**	**Model-5**	**Model-1**	**Model-2**	**Model-3**	**Model-4**	**Model-5**
Constant	0.00007*** (0.00047)	0.00007*** (0.00052)	0.00744*** (0.00055)	–0.00107*** (0.00096)	–0.00107*** (0.00092)	–0.00354*** (0.00015)	–0.00356*** (0.00015)	–0.00354*** (0.00018)	–0.02049*** (0.00305)	–0.02047*** (0.00307)
Growth in confirmed cases	–0.00034* (0.00003)		–0.00491 (0.00003)	–0.00394 (0.00025)	–0.00170 (0.00026)	–0.00053*** (0.00098)		–0.00062*** (0.00105)	–0.00068*** (0.00104)	–0.00066*** (0.00115)
Growth in deaths		–0.00002* (0.00006)	–0.00012 (0.00006)	–0.00018 (0.00009)	–0.00016 (0.00007)		–0.00016*** (0.00082)	–0.00021*** (0.00086)	–0.00038*** (0.00087)	–0.00017*** (0.00086)
Size				0.00006*** (0.00005)	0.00006*** (0.00007)				0.00073*** (0.00013)	0.00076*** (0.00018)
Patient Dummy					–0.00194** (0.00019)					–0.00015** (0.00032)
Death Dummy					0.00059 (0.00019)					–0.00008* (0.00033)
Observations	1,805	1,805	1,805	1,805	1,805	11,659	9,435	11,659	11,659	11,659
R-squared	0.00%	0.00%	0.10%	7.96%	7.97%	0.00%	0.00%	1.27%	9.23%	9.28%

Note: Impact of COVID-19 on stock market using CAR [–5, +5]. Growth in confirmed cases is measured as the daily growth in COVID-19 confirmed cases in a country. Growth in deaths is measured as the daily growth in the number of COVID-19 patients died. Size is logarithmic market capitalization. $Patient_{Dummy}$ = If confirm COVID-19 patient number is more than or equal 2,000 then it takes 1, other wise 0. $Death_{Dummy}$ = If confirm COVID-19 death number is more than or equal 30 then it takes 1, other wise 0. Significant coefficients are highlighted and superscripts ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

Table 6. Impact of COVID-19 on Stock Market Using CAR [–20, +20]

	Dhaka Stock Exchange					London Stock Exchange				
Variables	**CAR[–20, +20]**									
	Model-1	**Model-2**	**Model-3**	**Model-4**	**Model-5**	**Model-1**	**Model-2**	**Model-3**	**Model-4**	**Model-5**
Constant	0.00546*** (0.00469)	0.00568*** (0.00520)	0.00567*** (0.00521)	-0.00107*** (0.00009)	–0.00107*** (0.00009)	–0.00264*** (0.00015)	–0.00268*** (0.00016)	–0.00245*** (0.00016)	–0.01465*** (0.00343)	–0.01469*** (0.00345)
Growth in confirmed cases	–0.00107** (0.00249)		-0.00065 (0.00025)	–0.00074 (0.00024)	–0.00090 (0.00026)	–0.00074*** (0.00099)		–0.00144*** (0.00211)	–0.00148*** (0.00212)	–0.00142*** (0.00218)
Growth in deaths		–0.00059* (0.00061)	-0.00057 (0.00061)	–0.00055 (0.00059)	–0.00051 (0.00066)		–0.00013*** (0.00083)	–0.00064** (0.00113)	–0.00068** (0.00116)	–0.00064* (0.00113)
Size				0.00006*** (0.00005)	0.00006*** (0.00005)				0.00052*** (0.00015)	0.00059*** (0.00018)
Patient Dummy					–0.00004* (0.00002)					–0.00067** (0.00032)
Death Dummy					–0.00042 (0.00019)					–0.00024** (0.00042)
Observations	1,805	1,805	1,805	1,805	1,805	11,659	9,435	11,659	11,659	11,659
R-squared	0.01%	0.05%	0.12%	9.76%	10.02%	0.04%	0.08%	3.17%	14.0%	15.45%

Note: Impact of COVID-19 on stock market using CAR [–20, +20]. Growth in confirmed cases is measured as the daily growth in COVID-19 confirmed cases in a country. Growth in deaths is measured as the daily growth in the number of COVID-19 patients died. Size is logarithmic market capitalization. $Patient_{Dummy}$ = If confirm COVID-19 patient number is more than or equal 2,000 then it takes 1, other wise 0. $Death_{Dummy}$ = If confirm COVID-19 death number is more than or equal 30 then it takes 1, other wise 0. Significant coefficients are highlighted and superscripts ***, ** and * denote statistical significance at the 1%, 5% and 10% level, respectively.

react due to COVID-19 it has negative and significant effect on LSE, but it has negative but insignificant effect on DSE. We also know that developed countries stock markets companies are usually listed in few different stock markets, so due to that once one stock market share price has negative effect, then other stock market has that effect, because of that negative effect investors in other stock markets get worried about future profitability of the company, which help to get negative effect on other developed countries stock markets like UK. In the context of the rapid spread of COVID-19, changes in share price reflect market expectations about a number of effects, including changes in final demand, changes in intermediate demand and restrictions in supply. These things also had more effect on LSE compare to DSE.

5 CONCLUSION

COVID-19 pandemic has brought economic damage for all kind of economy, but our result suggest that it has brought more damage for developed economy than the developing economy. In this paper we examine, which stock market suffered more during the COVID-19 pandemic, whether developed country stock market or developing country stock market. In this study we used event study methodology, and we also used DSE as a proxy for developing countries stock market and LSE as a developed countries stock market. Using daily COVID-19 confirmed cases and deaths and cumulative abnormal returns data from one developing country (Bangladesh) and one developed country (UK), we find that stock market responds negatively and significantly to the increase in COVID-19 confirmed cases and deaths for LSE (developed countries stock market proxy). We further find that market responds negatively, but insignificantly to the increase in COVID-19 confirmed cases and deaths for DSE (developing countries stock market proxy). We used five different CAR's and in all different CAR shows us similar kind of results.

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