THE EARLY EFFECTS OF CORONA VIRUS ON THE INDEXES OF EMERGENT FINANCIAL MARKETS: CASE OF JORDAN

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Abstract - This article investigates the global and local Influences of the COVID-19 epidemic on the index of the Amman Stock Exchange (ASE). The study covers two sub periods during 2020. In the first period, there are no confirmed cases of the virus had recorded in Jordan, whereas the second period witnessed a little and stable number of recorded cases. Multiple regressions used in this study. The results revealed that globally, COVID-19 had a significant positive effect on the ASE index in first period, while this effect was significantly negative in the second period. Locally, in the second period, COVID-19 had a significant positive effect on the ASE index. The ratio of P/E had a significant positive effect on the ASE index in two periods. We hope that these results be useful to decision makers and those involved in the Amman financial market.

Keywords - Global COVID-19, Local COVID-19, Financial Market Index, Amman Stock Exchange, Jordan.

I. INTRODUCTION

Human history has recorded many devastating wars, but it has also recorded many cases of health disasters that confront human societies. Currently, humanity is experiencing one of the worst health disasters. It is the coronavirus, or COVID-19, pandemic. This epidemic originated in Wuhan, China, and quickly prevail to various countries due to the development of transportation systems.

In order to combat this epidemic, the countries of the world took different paths, ranging from complete openness to complete isolation. Jordan, which is one of the emerging countries, is characterized by its weak economic potential in the face of waves or large invasions of the virus. Therefore, since the beginning of the crisis, the Jordanian government has taken strict measures that have reached the point of complete isolation, whether from the outside world or at the local level between its various governorates. These measures prevented Jordan from registering any confirmed cases until the World Health Organization (WHO) announced, on march 11, 2020,its classification of the virus as a pandemic. Consequently, no confirmed case was recorded in Jordan until March 2, 2020. Since the outbreak of the epidemic, the global financial markets had begun to change. The ASE also had slight fluctuations in its index. However, when the WHO declared COVID-19 as a worldwide epidemic pandemic, the ASE began to lose points quickly, and Jordanian authorities closed the ASE on March 17, 2020. This closure continued until May 10, 2020. Jordan began to record daily confirmed cases starting from March 2, 2020. The daily number of new confirmed cases was about nine until the middle of August 2020, and the ASE reopened on May 11, 2020. Despite the stable number of cases over eight months, the ASE recorded gradual decreases in the index. Accordingly, this study examines the impact of COVID-19 on the ASE. More specifically, this study seeks to understand the impact of COVID-19 on the ASE index during two select periods. The first period, from January 5, 2020 to March 12, 2020, preceded the market closing. During this period, the market was only affected by global changes. The second period, after the reopening of the market, was from May 11, 2020 to August 6, 2020.

This study is currently one of the few studies in this field. The pandemic was not well-known in the first three months. Therefore, the literature about it was mostly personal opinions and expectations. As for academic and analytical studies, it began to be established beginning in April 2020. Such studies at this time, coinciding with the occurrence of the pandemic, may give some signs that may help in understanding the behavior of financial market indicators and establish databases and results that may be used in the future in similar circumstances. This study is also motivated by the increase in confirmed cases in Jordan since August 9, 2020, the apparent intention of the Jordanian government not to stop the wheel of the economy, and the harsh embargoes as in the first round of the disease at the local level. This study is the first study on the ASE, according to the researcher's knowledge. It is therefore a pioneering and proactive study. It is hoped that the results of this study will be useful to decision makers and those involved in the Amman financial market.

II. LITERATURE REVIEW

With the spread of COVID-19, fluctuations and volatility in global financial markets became evident and their trends were mostly declining, driven by daily announcements of confirmed cases, whether at the global or local level. With the passage of time, especially by the end of February 2020, the potential effects of the pandemic on global economies and

financial markets were predicted by researchers and journalism, such as Zhang et al. (2020), Arnold et al. (2020),and World Economic Forum (2020). This may be due to the instability of the epidemiological situation and the lack of sufficient data for statistical analysis. In fact, the terrifying numbers and collapses in the economic sector indicators began to be noticed in the month of March.

2.1. COVID-19 and Financial Markets

After one and half years of the COVID-19 pandemic, we can note that the studies on it are quickly expanding. More ever, we can note A growing number of articles linking COVID-19 to the financial markets (Buszko et al. 2021).

One of the first Chinese studies indicated that there is a negative effect of COVID-19 outbreak on COVID-19 outbreakboth the Chinese and Asian stock markets.

According to Kotishwar (2020), a significant negative long run relationship have observed between COVID-19and stock indices of six selected countries includes USA, Spain, France, Italy, China and India).

Studies of the influence of COVID-19 on financial markets have shown contradictory results among global financial markets. Other studies have also shown contradictory results on the local market itself. For example, Garcin et al. (2020) observed that COVID-19 has had “a more limited impact on financial markets in China, a strong impact in the US, and a slow recovery in Europe, P.1”, while Pata(2020) discussed the impacts of this epidemic on stock markets in theGroup of Seven. The results revealed that COVID-19 has had a negative effect on stock markets in these countries. Liu et al. (2020) indicated that 21 of the important stock market indices have declined rapidly under the short-term impact of COVID-19. Ashraf (2020) found that stock markets from 64 countries responded negatively to the growth in confirmed COVID-19 cases. He added "that stock markets reactedmore proactively to the growth in the number of confirmed cases as compared to the growth in the number of deaths, P.1”.

In China, Al-Awadhi et al. (2020) found that the daily growth of both confirmed and deaths cases resulting from COVID-19 has had a significant negative effect on stock returns in all companies. Also, Lee et al. (2020) showed that the high number of COVID-19 cases in Malaysia tends to negatively affect the performance of theKuala Lumpur Composite Index and all sectoral indicators, except for real estate investment.Sansa (2020) referred that confirmed cases of COVID-19 had a significant effect on the Shanghai Stock Exchange and New York Dow Jones markets. Regarding the US financial markets, Karina et al. (2020) says that COVID-19 has led to one of the fastest falls in the US stock market in history.Onali (2020) found that changes in the number of cases and deaths have no effect on US stock market returns, namely, Dow Jones and S&P500 indices. Yilmazkuday (2020:P.1) suggested “that having 1% of an increase in cumulative daily COVID-19 cases in the U.S. results in about 0.01% of a cumulative reduction in the S&P 500 Index after one day and about 0.03% of a reduction after one month”. Recently, Beak et al. (2020) indicated that COVID-19 has had a significant impact on the volatility of the US stock market.In American and European markets, it was found “that stocks react significantly negatively to the announcement of the first death” due to COVID-19 (Heyden&Heyden, 2020:P.1). Aslam et al. (2020) also confirmed the impact of COVID-19 on “the intraday multifractal properties of eight European stock markets, P.1”. Regarding developing countries, it seems that COVID-19 has had a great impact on the financial markets in these countries. Al-Khatib and Samet (2020) found that COVID-19 had hit 45 emerging countries hard, leading to “sharp declines in stock market indices, causing an escalation in volatility levels, and widening the premiums on sovereign credit default swaps, P.1”.

Regarding to non-curative government policies to confrontthe effects of COVID-19, studies have found that containment measures, social distancing, stay-at-home policies, and non-drug interventions on COVID-19 have had direct and indirect effects on financial market indicators (Bickley et al., 2020; Zaremba, et al., 2020; Baker et al., 2020). Other non-governmental factors have also been found to play a role in influencing stocks. For instance, environmental and social policies (Albuquerque et al., 2020), behavioral components of fear linked to the news of death (Rabhi, 2020), volume of Google search activity as a measure of panic and fear of COVID-19; oil prices, gold prices, and exchange rates (Lyócsa et al., 2020), panic-filled news (Haroon & Rizvi, 2020), and Brent crude price (Lee et al., 2020).

2.2. Hypotheses Initiation

As discussed in the previous section, many of the prior studies found that COVID-19 has had a negative impact on financial markets. On the other hand, a positive statistically significant relationship was found to exist between confirmed cases of COVID-19 and some markets. Jordan recorded no confirmed cases due to COVID-19 in the first two and half months of the pandemic,and a slow gradual decline in the ASE index was observed. Therefore, the main objectives of this study are to address the relationships between the ASE index and the COVID-19 pandemic represented by global confirmed cases, global death cases, and local

confirmed cases. Furthermore, all these relationships will be tested under control of ratio of stock price/earnings per share (P/E) for the entire ASE index. Consequently, the hypotheses are drawn as follows:

$H_0$1: There is no effect of global confirmed cases and deaths due to COVID-19 on the ASE index for the period from January 5, 2020 to March 12, 2020.
$H_0$2: There is no effect of global confirmed cases and deaths due to COVID-19 on the ASE index for the period from May 11, 2020 to August 6, 2020.
$H_0$3: There is no effect of number and size of local confirmed cases due to COVID-19 on the ASE index for the period from May 11, 2020 to August 6, 2020.

III. DATA AND METHODOLOGY

3.1. Data

Data relating to the Amman Financial Market were taken from the ASE website (www.ase.com.jo). Data on daily confirmed cases and death cases globally reported due to COVID-19 were taken from the WHO website (www.who.int), whereas data on daily confirmed cases locally reported due to COVID-19 were taken from the website of the Jordanian Ministry of Health (www.corona.moh.gov.jo).More specifically, the analysis in this study is based on the following idea: The news about COVID-19 comes in the evening at a time when the market is closed. Therefore, if there is any effect of this news, its effect will appear in the next day's trading in the market. The data covers two periods: the first period, starting from January 4, 2020 until the date of the last trading day, on March 12, 2020 before the ASE closed on March 17, 2020. At this time, Jordan had not recorded any confirmed cases yet. The second period starts from the date of market reopening on May 11, 2020 to August 6, 2020. The second period was determined due to the low rate of daily cases, which was about nine daily cases. After August 6, 2020, Jordan began to record an increase in cases. The number exceeded 20 daily cases. In fact, the daily cases in Jordan have been increasing since that day.

3.2. Variables

3.2.1. Dependent variable

The dependent variable in this study isthe ASE index (Free Float Index ASE 100).

3.2.2. Independent Variables

1. Global confirmed cases (GCC) and death cases (GDC) due to COVID-19 represented by data from the date of the announcement of the first case by the WHO on January 4, 2020.
2. Local confirmed cases (LCC) in Jordan due to COVID-19 represented by data from the date of reopening the market on May 11, 2020 to August 6, 2020.
3. The size of the number of daily cases at the local level (ZLCC). This variable is considered a dummy variable,where it is coded as one if the cases exceeded the rate of 10, otherwise it is coded as zero.

3.2.3. Control variable

A slow gradual decrease in P/E ratio of the ASE index was observed during theCOVID-19 outbreak. Based on this observation, this variable was included as a control variable.

IV. DESCRIPTIVE STATISTICS

The descriptive statistics for the variables used in this study are summarized in Table1 and Table2.

Variables	Obs	Mean	Std. Dev.	Min	Max
ASE Index1		1847.063	31.002	1754.114	1884.225
GCC1	50	1659.16	1519.938	0	6509
GDC1	50	71.50	77.669	0	355
P/E_1	50	11.594	.228	10.817	11.871

Table1: Descriptive statistics for the first period (1/5/2020–3/12/2020)

Variables	Obs	Mean	Std. Dev.	Min	Max
ASE Index2	59	1607.247	31.217	1559.597	1676.809
GCC2	59	159134.80	58270.648	73973	286062
GDC2	59	4408.92	975.686	1034	6802
LCC2	59	9.03	6.835	0	27
ZLLC2	59	.3559	.48290	.00	1.00
P/E_2	59	9.868	.190	9.479	10.170

Table2: Descriptive statistics for the second period (5/11/2020–8/6/2020)

When comparingTable2 with Table1, a decline of the ASE index could be seen in the second period by 17.23% (1884.225–1559.597).P/E had declined at the end of second period by 16.87%. It is obvious that the COVID-19 pandemic had an impact on the ASE index. The numbers of confirmed cases and deaths are increasing. Therefore, it is also obvious that the pandemic is growing.

V. EMPIRICAL RESULTS

A multiple regression was run to understand the effect of daily GCC, GDC, LCC, and ZLCCon the ASE index controlled by P/E ratio. To assess linearity a scatterplot of the ASE index against GCC, GDC, LCC, and P/E ratio were plotted for the two periods in this study. Visual inspection of these scatterplots indicated a linear relationship between the variables. There were homoscedasticity and normality of the residuals.

5.1. The first null hypothesis

A multiple regression was run to predict the ASE index1 from daily GCC1, GDC1, and P/E_1 ratio (Table3). These variables statistically significantly predicted the ASE index1. All three variables added statistically significantly to the prediction, $p<.05$. All three variables had positive statistically significant coefficients. Therefore, this study is consistent with studies conducted in this field such as Sansa (2020). Overall, the results do not support the first null hypothesis.

Dependent variable: ASE Index1	Coef.	t	Sig.	VIF
Independent variables:				
GCC1	.003	2.575	.013	2.917
GDC1	.083	2.814	.007	4.170
P/E_1	158.152	22.779	.000	1.990
$F(3, 46) = 239.636$, $p < .0005$, $R^2 = .940$, Adjusted $R^2 = .936$.				

Table3: Multiple regression analysis: The relationship between ASE Index1and GCC1 and GDC1 controlled by P/E_1.

5.2. The second null hypothesis

A multiple regression was run to predict the ASE index2 from daily GCC2, GDC2, and P/E_2ratio (Table4). These variables statistically significantly predicted the ASE index2.Two variables (GCC2 and P/E_2) added statistically significantly to the prediction, $p<.05$. GCC2had negative statistically significant coefficients whereas P/E_2 had positive statistically significant coefficients. GDC2 had no statistically significant coefficients.The results relating to COVID-19 for the second period are different from the first one.Therefore, regarding the confirmed cases, this study is consistent with many studies that record negative relationships in this field. To summarize, we accept the second null hypothesis for GCC2, while we reject the hypothesis for GDC2.

Dependent variable: ASE Index2	Coef.	t	Sig.	VIF
Independent variables:				
GCC2	.000	-6.308	.000	1.559
GDC2	.003	1.133	.262	1.529
P/E_2	119.558	12.123	.000	1.030
$F(3, 55)= 77.266$, $p < .0005$, $R^2 = .808$, Adjusted $R^2 = .798$				

Table4: Multiple regression analysis: The relationship between ASE Index2and GCC2 and GDC2controlled by P/E_2.

5.3. The third null hypothesis

A multiple regression was run to predict the ASE index2 from daily LCC2, ZLCC2,and P/E_2 ratio (Table5). These variables statistically significantly predicted the ASE index2.Two variables (LCC2 and P/E_2) added statistically significantly to the prediction, $p<.05$.Bothvariables also had a positive statistically significant coefficient.ZLCC2 had no statistically significant coefficient. To summarize, while the global confirmed cases due to COVID-19 affected the ASE index negatively in the second period, the local confirmed cases affectedthe ASE index positively. These results may be due to the relative stability in the recorded numbers of locally confirmed cases compared to the large increase in these cases at the global level. Finally, we accept the third null hypothesis for LCC2, while we reject the hypothesis for ZLCC2.

Dependent variable: ASE Index2	Coef.	t	Sig.	VIF
Independent variables:				
LCC2	1.647	2.334	.023	3.992
ZLCC2	-16.306	-1.645	.106	3.929
P/E_2	125.773	9.654	.000	1.047
$F(3, 55)= 37.383$, $p < .0005$, $R^2 = .671$, Adjusted $R^2= .653$				

Table5: Multiple regression analysis: The relationship between ASE Index2and LCC2 and ZLCC2 controlled by P/E_2.

VI. CONCLUSION

This study was carried out to investigate the effects of COVID-19 on the ASE index over two selected periods during 2020.Globallyconfirmed cases of Covid-19 revealed a contradictory effect between the two periods, as it was positive in the first period, while it was negative in the second period. However, the globallydeath cases and the size of locally confirmed cases had no significant effect on the ASE index. Finally, the ratio of P/E had a significant positive effect on the ASE index in two periods.

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