




“Is there an impact of COVID-19 on the returns of the Amman Stock Exchange?”

AUTHORS	Buthiena Kharabsheh  Omar K. Gharaibeh  Aseel Mahafza
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Buthiena Kharabsheh, Ph.D., Associate
Professor, Banking and Finance, Faculty
of Economic and Administrative
Sciences, Yarmouk University, Jordan.
(Corresponding author)

Omar Gharaibeh, Ph.D., Associate
Professor, Finance and Banking, School
of Business, Al-alBayt University,
Jordan.

Aseel Mahafza, Graduate Student,
Banking and Finance, Yarmouk
University, Jordan.



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Buthiena Kharabsheh (Jordan), Omar Gharaibeh (Jordan), Aseel Mahafza (Jordan)

IS THERE AN IMPACT OF COVID-19 ON THE RETURNS OF THE AMMAN STOCK EXCHANGE?

Abstract

This study examines the effect of the COVID-19 pandemic on the performance of the main indices and corporate returns in Jordan. The study employs two samples and two levels of analysis. The first one considers the effect of daily cumulative confirmed cases of COVID-19 on the daily return of the main index and sub-indices of the Amman Stock Exchange (ASE). The time-series analysis shows that there is a strong negative impact of the daily cumulative confirmed cases of COVID-19 on the daily return of the Amman Stock Exchange index. The results also indicate that the financial sector is the most affected during the epidemic, followed by the service and industry sectors. The insurance sector is positively affected, but not statistically significant.

The second level of analysis aims to test how different corporate financial characteristics might affect corporate immunity during the pandemic period. The sample includes all non-financial firms listed on ASE, with a total of 75 firms. Based on quarterly data, the findings show a statistically significant negative effect of the COVID-19 pandemic on non-financial corporate stock returns. Further, the evidence shows that larger firms with higher levels of cash holding have better immunity and thus experience higher returns during the pandemic period.

Keywords

COVID-19, pandemic, financial market, corporate
return, corporate immunity, Jordan

JEL Classification

G10, G14

INTRODUCTION

Since December 2019, the beginning of suffering has started in the capital of Hubei Province, Wuhan in China. A novel virus was initially discovered in Wuhan, then spreading quickly through the whole globe. Less than a year after the outbreak of a virus called COVID-19, on October 6, 2021, the formal numbers of WHO show around 235 million confirmed cases of COVID-19 and more than 4 million death cases, had been officially declared around the world (WHO, 2021)¹.

Apart from the huge health threat to humans everywhere, the negative economic consequences of the pandemic are considered the most forceful ever. Recent studies have documented that, compared to prior health pandemics (e.g. SARS, Ebola, Spanish Flu) and economic crisis (e.g. 2007–2009 financial crisis), the COVID-19 pandemic brought the most negative effect on worldwide economies (Baker et al., 2020). Both developed and emerging countries were negatively influenced in terms of slow-down in GDP, production and supply chains, higher inflation and unemployment rates. The pandemic also hit the financial markets and influenced the investors' behavior, increasing their concerns and risk aversion due to the high volatility in the equity markets (Barro et al., 2020).

1 See <https://covid19.who.int/>

Jordan as part of this world has reported the first case of COVID-19 on March 3, 2020. The Jordanian government has applied several protocols, like the rest countries, to deal with and curb the pandemic effect. As a small economy, Jordan was heavily affected by the consequences of the COVID-19 outbreak. According to the World Bank figures, the unemployment rate sharply increased to 24.7% in the fourth quarter in 2020, registering 50% among youth. The Jordanian economy by the third quarter of 2020 declined by 1.5%, mainly due to the huge losses from the travel and tourism sectors. The main and only financial market in Jordan, ASE, was also closed at the beginning of the pandemic, reporting a decrease in the trading value of more than 33% at the end of 2020 (ASE Report, 2020)²

Motivating by the huge negative consequences of COVID-19 on various economic dimensions, this study has two main objectives. The first one is to test the effect of the COVID-19 pandemic on the general main index and the sub-indices of ASE. The second objective is to examine how corporate financial characteristics affect the immunity of corporate returns against the COVID-19 pandemic.

Therefore, this study is expected to contribute to the literature as follows: First, despite the fast-growing literature on COVID-19, the evidence available from emerging economies is still limited. This study is one of the first that considers the effect of a pandemic on the returns of the Jordanian market index and sub-indices using time-series analysis. Second, this study investigates how different financial characteristics and macroeconomic factors might affect corporate immunity during the pandemic period employing panel data analysis. For instance, do firms with higher leverage suffer less or more during the pandemic period? Other corporate characteristics were examined such as cash holding, profitability and firm size. The impact of inflation, growth and unemployment rate was also examined. Thus, the analysis of this study provides a comprehensive picture by analyzing the effect of the COVID-19 pandemic on the market level, sub-indices, and then on the corporates level. Accordingly, the findings of this work will expand the understanding of how such a health crisis may affect the performance of the market. Third, the results of this study are expected to have several important implications, since it might be a reference to policy makers, corporate managers and investors as well.

The reminder of this paper proceeds as follows. The next section reviews part of the relevant empirical studies. Section 2 presents the data and method. Section 3 presents the results. The last section discusses and concludes the paper.

1. LITERATURE REVIEW

There is a big debate among financial analysts and academics to understand the behavior of investors and the movement of stock prices in the financial markets. There are two main theories in this field. The first theory is based on conventional financial theory, which is the efficient market hypothesis (EMH) developed by Fama (1970). According to EMH, it assumes that stock prices respond to information quickly, stocks move randomly, investors are rational and have no bias in their behavior. Although there are many previous studies supporting this hypothesis, it has been largely challenged by the second finance theory, which is the theory of behavioral finance.

The behavioral finance theory was developed by Shleifer and Summers (1990) and others. They focused on the systematic behavior of noise traders who move in the same direction. Trueman (1994), Cote and Sanders (1997), Shiller (2003) and Tan et al. (2008) demonstrated that investors tend to follow each other's behavior in their investing activities and referred to this behavior as the herding. Barberis et al. (1998), Daniel et al. (1998), and Hong and Stein (1999) presented three behavioral models based on underreaction, overreaction, conservatism, overconfidence and self-attribution bias. These models proved that investor decisions are irrational because they are affected by psychological factors, and this leads to abnormal price biases.

2 This report can be viewed at <https://www.ase.com.jo/en/news/Performance-Amman-Stock-Exchange-During-2020>.

Hirshleifer (2001) classified the most important psychological biases influencing investors decisions into three factors: self-deception, heuristic simplification and emotional loss of control. Burns et al. (2012) argued that investors become more pessimistic when the market trend is down, which leads behavioral of investors to a short-term reversal. Shu (2010) noted that sentiment has an impact on stock market behavior and that volatility in investor sentiment can directly affect asset prices and expected returns. The behavioral finance theory motivated us to investigate how investors' sentiment during the COVID-19 pandemic affected the Amman Stock Exchange (ASE) not only at the level of the general market index, but also on the sub-indices of sectors, and at the level of companies in Jordan.

The first case of COVID-19 was detected by the World Health Organization (WHO) on December 31, 2019 in the Chinese city of Wuhan (Al-Qudah & Houcine, 2021). Zaremba et al. (2020) pointed out that the disease began to spread to the rest of the world very quickly, infecting millions of people in more than 200 countries. The impact of COVID-19 was considered as a frightening and unprecedented challenge for investors and stock markets (Liu et al., 2020). Using cross-sectional analysis, Ramelli and Wagner (2020) revealed that analysts and investors are becoming concerned about companies with high debt, little liquidity and small size. The Corona pandemic pressured investors in the financial markets, therefore, this was directly reflected on stock indices around the world. For example, at the level of 21 leading stock market indices using an event study method, Liu et al. (2020) showed that short-term stock market returns were significantly and negatively affected by COVID-19 cases. They revealed that Asian countries experienced more negative abnormal return levels and react more quickly to the outbreak than other developed countries. In this regard, using ordinary least square regression (OLS), Almarayeh (2020) supported findings of Liu et al. (2020) and showed that the growth in COVID-19 deaths negatively affected stock markets across 13 developing countries, including the Middle East and North Africa area (MENA). Likewise, Topcu and Gulal (2020) confirmed the impact of the COVID-19 outbreak on 26 emerging stock market indices.

The impact of the COVID-19 virus has extended not only at the level of market indices, but also at the level of the companies and the industries in developed and developing countries. For example, following Elder and Serletis's (2010) model based on a bivariate structural GARCH-in Mean VAR, Xu (2021) confirmed a negative relationship between the COVID-19 cases and stock returns in the U.S. and Canada. More recently, Using Standard and Poor's 1,500 companies and the industry-level, Mazur et al. (2021) demonstrated that stocks of food, natural gas, software, and health care generated high positive returns, while stock values in real estate, petroleum, hospitality, and entertainment sectors fall significantly.

At the level of developing countries, Nia (2020) revealed that the financial sector was the most affected on the Vietnamese stock market. However, in the Chinese stock markets, Xiong et al. (2020) found that the most affected companies are those within industries exposed to the COVID-19 pandemic and those with a large institutional investor. Another study from China presented by He et al. (2020) demonstrated that the COVID-19 pandemic negatively impacted stock prices on the Shanghai Stock Exchange, while it positively impacted stock prices on the Shenzhen Stock Exchange. At the level of Chinese industries, He et al. (2020) showed that mining, transportation, environment, electricity and heating industries are negatively affected by COVID-19, while other industries such as information technology, health-care, education and manufacturing were less affected. In India, Alam et al. (2020) found that the market and average abnormal return (AAR) responded positively during the current lockdown period and investors reacted positively to the expected the lockdown, while the investors panicked in the pre- lockdown period and this was reflected negatively on the AAR.

Based on the above review, several gaps appear in the literature. The available evidence mainly comes from developing countries, however very few studies examine such effect from developing emerging economies, i.e. like Jordan. Further, most previous studies have considered the impact of COVID-19 at the level of major indices such as Liu et al. (2020), Almarayeh (2020), and Topcu and Gulal (2020), or industries and firms

such as Mazur et al. (2021), Xu (2021), Anh and Gan (2020), and Nia (2020); none of these studies addressed the effect of COVID-19 at the level of sectors. Moreover, none of the above studies investigated how corporate financial characteristics may determine the immunity of firms during this pandemic. The purpose of this study, therefore, is to examine the effect of the COVID-19 pandemic on the main market index, sub-indices and corporate returns of ASE in Jordan.

2. METHODS

2.1. Sample

Two datasets are employed to achieve study objectives; the first data on the level of indices in ASE to know the impact of the pandemic on the main market index and sector indices. In this first level of analysis and based on daily data using a time-series analysis, the first data includes main market index of ASE and the sub-indices of the four main sectors, namely banking, insurance, services and industry. The main index and the four sector indices data were downloaded from the ASE website³

The daily data for the closing prices and COVID confirmed cases were retrieved over the period 15/3/2020 to 16/6/2020, with a total number of 275 observations for each indicator. The cumulative confirmed cases were used instead of the confirmed cases, because the impact of the pandemic is cumulative and continuous. It is worth noting that at the beginning of the pandemic, ASE was closed between the periods March 16, 2020, to May 10, 2020. Therefore, data for the aforementioned period is not available.

The second level of analysis examines the effect of the characteristics of these firms such as Return on Assets (ROA), Firm Size (FS), Company Cash Holding (CH) and Company Leverage (CL) on the stock returns. Also, this second level of analysis uses the macroeconomic variables such as unemployment (UNEM), growth domestic product (GDP), and inflation (INF) to study the impact of these factors on returns of non-financial firm stocks during the pandemic. Although this

second level of analysis takes into account company characteristics and macroeconomic factors using a panel data analysis, it uses quarterly data. Therefore, the number of observations is 10 for each variable. The reason for choosing the quarterly data is the lack of daily data on a company's characteristics. This second sample includes all non-financial firms listed on ASE, with a total of 75 firms. Due to the special characteristics and different accounting treatments, firms in the financial sector are excluded from this second analysis. The second dataset starts from Q1/2019 to Q2/2021. All the financial data used in this second level of analysis were extracted from the website of ASE as well. Data related to the COVID cases, are based on the figures available from the World Health Organization (WHO) website.

2.2. Variables

The main dependent variable is market return, which is calculated using daily closing prices. Consistent with the prior literature (see, Waheed et al., 2017, for example) returns are calculated using the following equation:

$$RT = \ln \left(\frac{P_t}{P_{t-1}} \right), \quad (1)$$

where P_t is the closing price for the day (t), P_{t-1} is the closing price for the day ($t - 1$). This equation is used for the general market index, then repeated for the main sub-indices i.e. Banks, Industry, Service and Insurance. For instance, to calculate general market return, the closing prices for the general index are used, whereas to calculate the return for the banking sector, the closing prices for the banking sector index are used, and so on. Returns are calculated over the period 15/3/2020 to 16/6/2021.

The interest of this paper is to look for the effect of the COVID-19 pandemic on the Jordanian financial market at the level of the main market index and sub-indices of four sectors, as well as non-financial returns. According to the World Health Organization (WHO), COVID-19 was officially classified as an international pandemic on March 11, 2020. In Jordan, the first case of Corona was

3 <https://www.ase.com.jo/en>

diagnosed on the third of March, 2020. The first level of analysis of this study relies on the WHO website to collect data on COVID-19. The natural logarithm of the cumulative confirmed daily cases is used as a proxy for COVID-19 (Harjoto et al., 2020; Narayan et al., 2021).

For the second level of the analysis, this study includes several corporate financial characteristics to examine how these variables are related to the corporate stock returns during the pandemic period. These variables are calculated quarterly starting from the first quarter in 2019 to the second quarter of 2021. Firm size is measured using the natural logarithm of total assets; leverage is calculated by dividing total debt over total assets; cash holding is measured as the sum of cash and cash equivalent divided by total assets; profitability is calculated as net income over owners' equity. This study also controls for three macroeconomic variables, namely, inflation, unemployment and GDP. These macroeconomic quarterly data are retrieved from the website of the central bank of Jordan. Corporate financial characteristics are measured and included consistent with several prior studies (Demir & Danisman, 2020; Ding et al., 2020; Zaremba et al., 2021).

To test the effect of the COVID-19 pandemic on the ASE, the OLS regression is employed and all the standard errors are corrected using HAC (heteroskedasticity and autocorrelation consistent).

$$RT_t = \alpha_0 + \ln(CCOVID)_t + \varepsilon_t, \quad (2)$$

where RT_t is either the market return index or banking index return or industry index return or insurance index return in period t . $\ln(CCOVID)_t$ is the natural logarithm of the daily cumulative confirmed cases of COVID-19 at time t , ε_t is residual errors at period t .

The second objective of this study is to test how corporate stock returns were affected by the COVID-19 pandemic and how the corporate financial characteristics and macroeconomic factors are related to corporate stock returns during the pandemic period. Based on quarterly data, a panel data set is employed using the following model:

$$\begin{aligned} RT_{it} = & \alpha_0 + \beta_1 \ln(CCOVID)_t + \\ & + \beta_2 (ROE)_{it} + \beta_3 (FS)_{it} + \\ & + \beta_4 (CH)_{it} + \beta_5 (LEV)_{it} + \\ & + \beta_6 (UNEM)_t + \beta_7 (GDP)_t + \\ & + \beta_8 (INF)_t + \varepsilon_t, \end{aligned} \quad (3)$$

where RT_{it} is quarterly return of firms i in period t ; daily data was averaged in order to calculate quarterly stock returns, $\ln(CCOVID)_t$ is the natural logarithm of the quarterly cumulative confirmed cases of COVID-19 in period t , $(ROE)_{it}$ is quarterly profitability of firms i in period t ; $(FS)_{it}$ is quarterly size of firms i in period t ; $(LEV)_{it}$ is quarterly leverage of firms i in period t ; $(UNEM)_t$ is quarterly unemployment ratio in Jordan in period t ; $(GDP)_t$ is quarterly growth domestic product ratio in Jordan in period t ; $(INF)_t$ is quarterly inflation ratio in Jordan in period t ; α_0 is intercept; $\beta_1, \beta_2, \beta_3, \beta_4, \beta_5, \beta_6, \beta_7, \beta_8$ is the coefficients of independent variables; ε_t is the residual errors in period t .

The robustness of the COVID-19 effect can be checked by replacing the dummy variable (DUM) that takes a value of one from the first day of the COVID-19 spread in Jordan and zero for the period before. This dummy variable is in equation (4) instead of $\ln(CCOVID)_t$ in equation (3) as follows:

$$\begin{aligned} RT_{it} = & \alpha_0 + \beta_1 (DUM)_t + \beta_2 (ROE)_{it} + \\ & + \beta_3 (FS)_{it} + \beta_4 (CH)_{it} + \beta_5 (LEV)_{it} + \\ & + \beta_6 (UNEM)_t + \beta_7 (GDP)_t + \\ & + \beta_8 (INF)_t + \varepsilon_t, \end{aligned} \quad (4)$$

where $(DUM)_t$ refers to the dummy variable (DUM) that takes a value of one from the first day of COVID-19 spread in Jordan and zero for the period before. Recall, all these variables are based on quarterly data from the first quarter in 2019 to the second quarter of 2021.

3. RESULTS

Table 1 shows daily returns for the ASE general index and the sub-indices as well over the study period. The figures indicate the high variation in the

Table 1. ASE daily returns

	Market index and sectors return			
	Mean	SDEV	MIN	MAX
ASE Index Daily Return	0.0008	0.0080	-0.0467	0.0323
Bank Sector	0.0001	0.0098	-0.0593	0.0412
Service Sector	0.0003	0.0051	-0.0240	0.0184
Industrial Sector	0.0026	0.0142	-0.0433	0.0530
Insurance Sector	-0.0002	0.0031	-0.0110	0.0109

Table 2. Descriptive statistics

Variable	Obs.	Mean	SDEV	MIN	MAX
Stock Return	645	-0.069	0.241	-1	3.452
CCOVID	657	0.091	0.154	-0.059	0.401
ROE	638	3.144	3.684	0.006	28.05
FS	638	17.21	1.42	9.34	21.27
CH	639	0.07	0.30	0	7.32
Lev	653	0.33	0.22	0	0.97
UNEM	584	0.21	0.02	0.19	0.25
GDP	584	0.006	0.020	-0.036	0.021
INF	584	0.001	0.012	-0.018	0.020

daily returns, by looking on the minimum and the maximum values. The highest mean value is represented by the industrial sector where the mean is around 0.003 with a maximum value of 0.05. These figures are consistent with a recent report issued in June 2021 by Jordan strategy forum, the

report shows that the financial sector was highly and negatively affected by the pandemic. Further, the report attributed the high drop in the general index of ASE to the drop noticed in the financial sector. Likewise, figures from 1 to 5 show daily returns for the main indices in ASE.

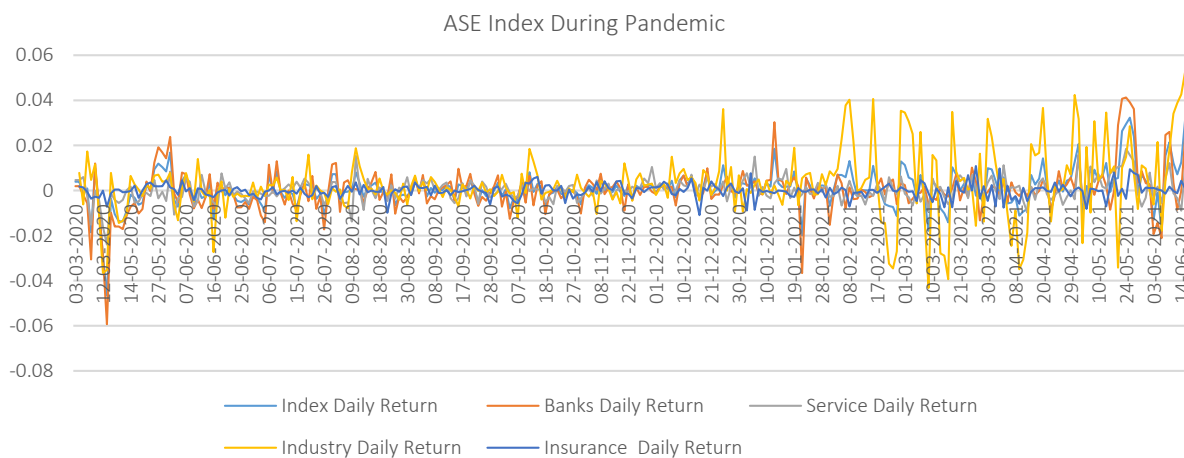


Figure 1. ASE index during the pandemic

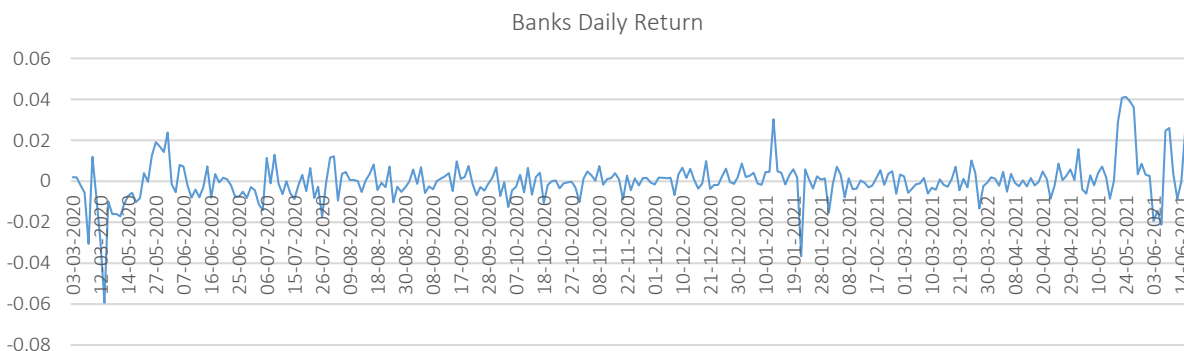


Figure 2. Bank indices during the pandemic

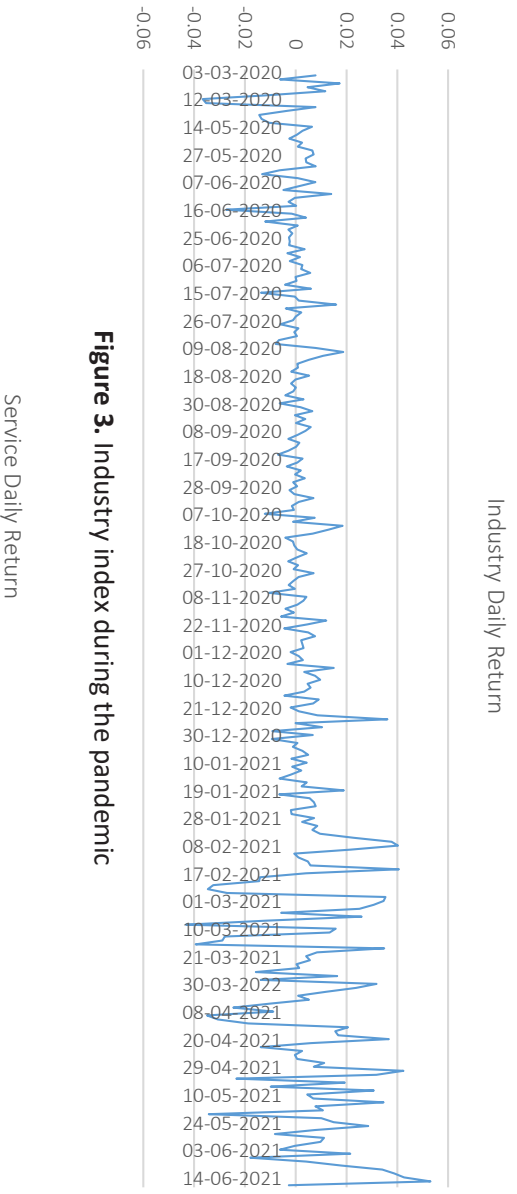


Figure 3. Industry index during the pandemic

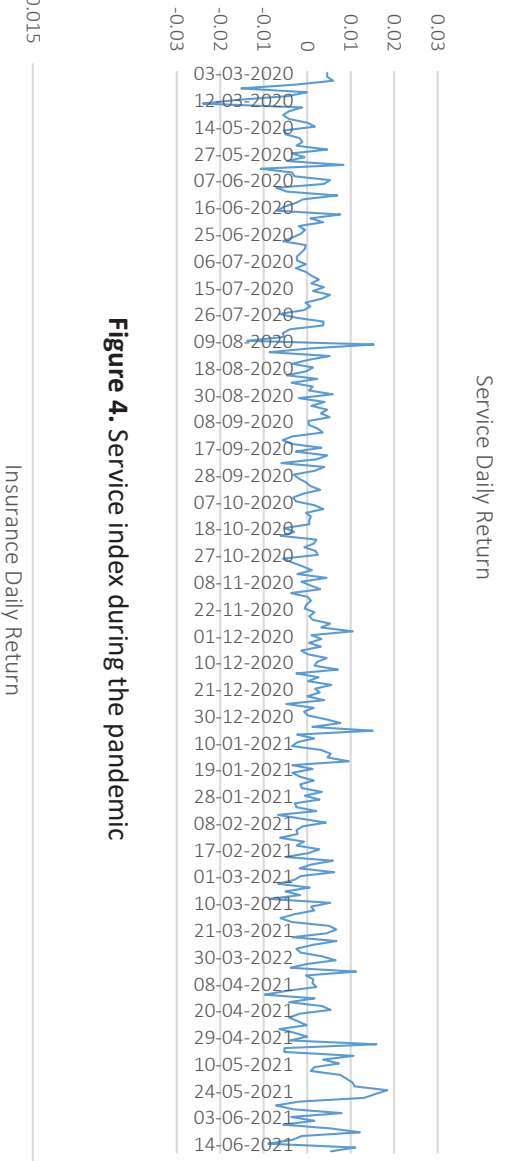


Figure 4. Service index during the pandemic

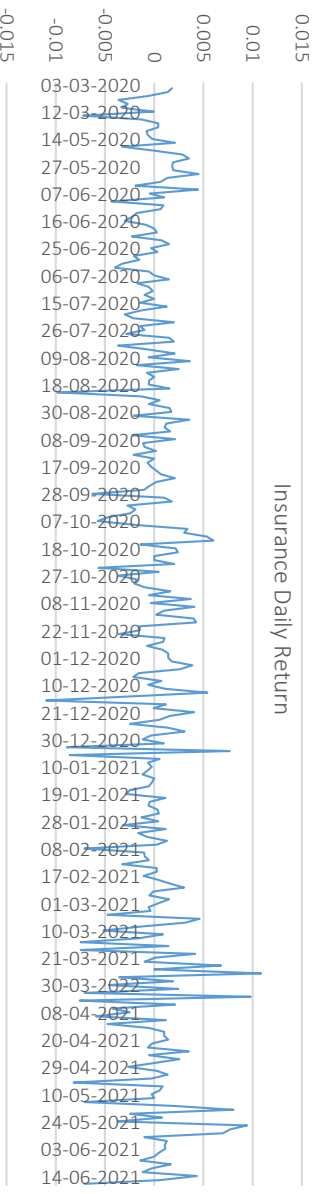


Figure 5. Insurance index during the pandemic

Table 3. Correlation matrix

	COVID	ROE	FS	CH	Lev	UNEM	GDP	INF
CCOVID	1.000							
ROE	-0.005	1.000						
FS	-0.018	0.095	1.000					
CH	0.027	-0.089	-0.04	1.000				
Lev	-0.035	0.29	0.36	-0.37	1.000			
UNEM	0.451	0.034	-0.03	0.019	-0.021	1.000		
GDP	-0.219	-0.044	0.015	0.02	-0.011	-0.630	1.000	
INF	-0.519	-0.005	0.004	-0.020	0.016	-0.09	-0.125	1.000

Table 4. VIF

Variable	VIF	1/VIF
CCOVID	1.29	0.7736
ROE	1.23	0.8127
FS	1.36	0.7368
CH	1.12	0.8914
Lev	2.13	0.4697
UNEM	2.19	0.4558
GDP	2.08	0.4817
INF	1.49	0.6716
Mean VIF 1.55		

Table 2 presents the descriptive statistics for all the variables employed in the regression. On average, the mean value of the corporate stock return is negative, around -7%. The average of confirmed cases of COVID-19 reaches 9% during the study period. Return on equity values range from 0.006 minimum to a maximum value of 28%. Cash holding shapes only 7% in Jordanian companies, whereas leverage constitutes a large portion of the companies' capital structure reaching a maximum value of 97%. During the study period, the average of unemployment, GDP, and inflation is 21%, 0.006, and 0.001, respectively. Table 3 shows the correlation matrix for all the independent variables of the study. The figures indicate that the highest value is -0.63 found between GDP and unemployment. The mean value of variance inflation factor (VIF) is 1.55, presented in Table 4. According to the figures in both Tables 3 and 4, the data set is free from multicollinearity problem, since all the values are less than the cut points suggested (see for example, Gujarati, 2004).

The main regression in this study starts by examining the relationship between the return of the general market index and the confirmed cases of COVID-19 in Jordan during the study period i.e. from 15/3/2020 to 16/6/2021. Table 5 shows a strong negative significant relationship between

the two variables with ($\beta = -0.019$, $p < 1\%$). This finding indicates that as the number of confirmed cases increases, the market return negatively decreases. Prior studies report similar negative effects, see for example Xu (2021) for the American and Canadian stock markets, Narayan et al. (2020) for the Australian market, Al-Qudah and Houcine (2021) for different six WHO regions, Liu et al. (2020) for Asian countries, and Topcu and Gulal (2020) for 26 emerging stock market. These studies commonly attributed this negative to the fear and investors' pessimism regarding uncertain future returns.

In Table 6, the analysis moves toward the relationship between the return of sub-indices and confirmed cases of COVID-19. Table 6 is divided into 4 panels, A, B, C, and D, representing the main sectors according to ASE classification, i.e. industry sector, banking sector, service sector, and insurance sector. Panel A indicates that the industry sector was negatively affected by the pandemic, however, this negative relationship is relatively weak in the industry sector where the p -value $< 10\%$. The second panel (B) provides important insights regarding the banking sector. First of all, a strong negative significant relationship is documented between banking sector return and confirmed cases in Jordan with ($\beta = -0.0249$, $p < 1\%$).

Table 5. General market index and confirmed cases of COVID-19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Con.	0.002022	0.000714	2.832519	0.005***
CCOVID	-0.019884	0.005462	-3.640490	0.000***
R-squared	0.05	Durbin-Watson		1.292269
Adjusted R-squared	0.045	# of observation		274
F-statistic	14.04252		-	
Prob(F-statistic)	0.000218			

Note: ***, **, and * represent significance level at 1%, 5% and 10%, respectively; all statistics are corrected using HAC standard errors.

Table 6. Sub-indices' return and confirmed cases of COVID-19

Variable	Coefficient	Std. Error	t-Statistic	Prob.
Panel (A) Industry Sector				
Con.	0.003640	0.001290	2.821119	0.005***
CCOVID	-0.016847	0.009478	-1.777474	0.076*
R-squared	0.0094	Prob(F-statistic)		0.10006
Adjusted R-squared	0.0058	Durbin-Watson		1.372938
F-statistic	2.6008	# of observation		274
Panel (B) Banking Sector				
Con.	0.001596	0.000899	1.775336	0.077*
*CCOVID	-0.024953	0.005522	-4.518592	0.000***
R-squared	0.05	Prob(F-statistic)		0.00018
Adjusted R-squared	0.047	Durbin-Watson		1.217374
F-statistic	14.58001	# of observation		274
Panel (C) Service Sector				
Con.	0.000766	0.000409	1.871542	0.062*
CCOVID	-0.007390	0.002468	-2.993797	0.003***
R-squared	0.015	Prob(F-statistic)		0.040057
Adjusted R-squared	0.017	Durbin-Watson		1.760021
F-statistic	4.256190	# of observation		274
Panel (D) Insurance Sector				
Con.	-0.000132	0.000206	-0.643648	0.5203
CCOVID	0.000300	0.001181	0.254481	0.7993
R-squared	0.0001	Prob(F-statistic)		0.896311
Adjusted R-squared	0.0003	Durbin-Watson		2.162230
F-statistic	0.017016	# of observation		274

Note: ***, **, and * represent significance level at 1%, 5% and 10%, respectively; all t-statistics are corrected using HAC standard errors.

Second, among the four sectors, the banking sector was highly negatively affected registering the highest losses. The banking sector in Jordan constitutes the largest proportion of the financial sector. Therefore, it can be concluded that the financial sector is the most affected sector among other sectors during the Corona pandemic. This result supports the results documented by Nia (2020) who finds that the financial sector was the most affected on the Vietnamese stock market. Several factors contribute to this negative effect, including the increased level of unemployment that definitely influences the repayment ability for most bank clients who lost their jobs. Lockdown during the pandemic also significantly reduces the income generated for most sectors and businesses. In addition, wages and salaries for public and private sector employees were also decreased sometimes to more than 50%. All these factors together negatively influence the credit facility installments in the Jordanian banking sector.

Panel C reports the negative and significant relationship between the returns of the service sector and the confirmed cases of COVID-19. This find-

ing is expected due to the slowdown in the general economic activities. The health protocol applied during the pandemic that led to the lockdown and social distancing results in less demand for most services, in general. The insurance sector, according to panel D, was not affected by the negative consequences of the pandemic. This might be explained by the lower compensation paid by insurance companies during the pandemic, since a lower rate of accidents and theft, for instance, is expected due to the long hours of lockdown applied.

During the Corona pandemic, negative or bad news begins to spread rapidly and feelings of fear begin to dominate investors. This prompted investor behavior to move in the same direction. They tended to follow each other's behavior in their investment activities as a herd. This behavior has been explained by the behavioral finance theory by Shleifer and Summers (1990) and others. They focused on the systematic behavior of noise traders who move in the same direction. In the same vein, Trueman (1994), Cote and Sanders (1997), Shiller (2003), and Tan et al. (2008) demonstrated that investors tend

to follow each other's behavior in their investing activities and referred to this behavior as the herding.

This section tests how corporate financial characteristics do matter during the pandemic period. Accordingly, corporates' stock returns are regressed against the accumulated confirmed cases of COVID-19 in addition to several financial characteristics in the model. It is important to indicate that the study starts from Q1 of 2019 to Q2 of 2021. Then the analysis was repeated, including a dummy variable, to indicate the period of the pandemic. Before moving to the analysis, the Lagrange Multiplier (LM) test is conducted to select between OLS and Panel analysis. The p-value for this test was $\chi^2 = 52.72$ with prob. $> \chi^2 = 0.000$, recommending to continue with panel data analysis. Next the Hausman test is conducted to choose between Random effect model and Fixed effect model. The p-value for the Hausman test was $\chi^2 = 45.99$ with prob. $> \chi^2 = 0.000$, suggesting to select Fixed effect model. Thus, the analysis for models 3 and 4 are conducted using Fixed effect model. It is worth noting that the Breusch-Pagan/Cook-Weisberg test is also performed, and the p-value was $p = 0.000 < 1\%$, confirming the presence of heteroskedasticity. Accordingly, all the t-statistics are corrected for robust standard errors.

Table 7. Corporate immunity to the accumulated COVID-19 pandemic

Variables	Panel (A)
Con.	-2.415*** (0.001)
CCOVID	-0.210*** (0.001)
ROE	0.0017 (0.620)
FZ	0.142*** (0.004)
CH	1.519*** (0.000)
LEV	-0.191 (0.319)
INF	-0.637 (0.446)
GDP	-1.608*** (0.009)
UNEM	-0.569 (0.318)
R ²	0.08
# of Observation	562

Note: ***, **, and * represent significance level at 1%, 5% and 10%, respectively; all the t-statistics are corrected for robust standard errors.

In the previous section, this study tests the effect of the COVID-19 pandemic on the general market and indices returns. This part moves to the effect on the corporate returns level. The findings are presented in Table 7. In panel A, a negative and significant relationship is found between the COVID-19 variable and corporate stock returns, indicating that as the confirmed cases increase, the corporates' return decrease. From Table 7, firms with larger size have experienced higher returns ($\beta = 0.142$, $p < 1\%$). Similarly, firms with a higher level of cash have higher returns, this is explained by the strong positive relationship documented from panel A, Table 7 ($\beta = 1.519$, $p < 1\%$). However, other variables like return on equity, leverage, inflation, and unemployment have no significant effect on corporate stock returns. Opposite to the expectation, GDP is found to be negative and significant ($\beta = -1.608$, $p < 1\%$). The negative relationship between stock returns and GDP can be attributed to the pessimism of investors in the stock market in the past years during the study period and this reflected negatively on stock performance, while the GDP was growing very slowly.

3.1. Robustness check

The robustness of the COVID-19 effect can be checked by replacing dummy variable (DUM) that takes a value of one from the first day of COVID-19 spread in Jordan and zero for the period before. Therefore, Table 8 repeats the same regression removing the number of COVID-19 confirmed cases and including a dummy variable (DUM) that represents the COVID-19 period, i.e. takes the value of one for the period 15/3/2020 (starting period of the pandemic) to 16/6/2021 (the last observation in our study), and zero otherwise. The findings in panel B reveal a strong negative effect of the pandemic on corporate returns ($\beta = -0.139$, $p < 1\%$), confirming the results in Table 7. Regarding the corporate financial characteristics, the results in Table 8 remain the same, showing that during the pandemic period larger firms with more cash holdings have higher returns. These findings are consistent with Anh and Gan (2020), Xiong et al. (2020) and Ding et al. (2020).

Table 8. Corporate immunity to the accumulated COVID-19 pandemic

Variables	Coefficient (p-value)
Con.	-2.722*** (0.001)
DUM	-0.139*** (0.000)
ROE	0.007 (0.835)
FZ	0.137*** (0.005)
CH	1.551*** (0.000)
LEV	-0.183 (0.334)
INF	1.133 (0.136)
GDP	-1.877*** (0.002)
UNEM	-1.590 (0.123)
R ²	0.07
# of Observation	562

Note: ***, **, and * represent significance level at 1%, 5% and 10%, respectively; all the t-statistics are corrected for robust standard errors.

CONCLUSION

This paper aims to assess the impact of daily accumulated confirmed cases of COVID-19 on the ASE main market index and the sub-indices of the four main sectors, i.e. financial, services, industrial and insurance sector. In addition, using quarterly panel data analysis, this study aims to examine the effect of COVID-19, financial characteristics of companies and macroeconomic factors on the stock returns of non-financial companies. The findings document that the impact of daily accumulated confirmed cases of COVID-19 is negatively and statistically significant on the main market index and both the financial and service sectors indices. For the industry sector index, it showed that there is a negative effect, but it is statistically weak. The insurance sector index is the only indicator that showed a positive impact, but it is not statistically significant.

At the companies' level, the results reveal a strong negative statistically significant impact of COVID-19 on a company's stock returns. Moreover, the data shows that larger companies and those with higher levels of cash are better immune and therefore have seen higher returns during the pandemic. On the other hand, there is no significant impact of the financial leverage or profitability of a company during the COVID-19 pandemic.

The findings of this study also could have important implications for policymakers. While the results found a strong negative effect of the pandemic on the market performance as well as the corporates' returns, policymakers should take several actions to protect the market and maintain investors' confidence. For example, in Jordan, at the beginning of the COVID-19 outbreak, several decisions were taken to protect the market, such as reducing the trading hours to only one hour, controlling the ceilings of rising and falling for equity prices, which were modified from 7% to 5% reaching 2.5% as a maximum rate for prices to move up and down. Future research may replicate this study by extending the study period, selecting other measures of COVID-19 or even including other financial characteristics.

AUTHOR CONTRIBUTIONS

Conceptualization: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Data curation: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Formal analysis: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Investigation: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Methodology: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Project administration: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Resources: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Software: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Supervision: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Validation: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Visualization: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Writing – original draft: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.
 Writing – review & editing: Buthiena Kharabsheh, Omar Gharaibeh, Aseel Mahafza.

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