



Impact of the COVID-19 virus on MENA stock market

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Abstract: This study examines the influence of contagious infectious diseases, specifically COVID-19, on stock market behavior. With the global emergence of COVID-19, we have witnessed not only the health implications of a pandemic but also its profound social and economic repercussions, exacerbated by the implementation of lockdown measures. Utilizing panel data analysis, we assess the impact of disseminated information regarding the virus on the stock markets of the MENA region. Our findings reveal that the daily increases in both total confirmed cases and total deaths attributable to COVID-19 have a consistently significant and negative effect on stock returns across all observed markets. In conclusion, our analysis confirms that the spread of COVID-19 has had a detrimental impact on stock market returns in the MENA region. This underscores the vulnerability of financial markets to global health crises and highlights the necessity for market participants to consider health-related information as a significant factor in risk assessment and investment decision-making processes.

Keywords: COVID-19, Stock Market Reaction, MENA Region, Infectious Diseases and Finance, Market Efficiency, Economic Impact of Pandemics

1. Introduction

Each event, regardless of its apparent magnitude or direct economic impact, can influence the value of a publicly listed company and, consequently, affect financial markets. This influence may be political, societal, organizational, environmental, athletic, etc., by altering the return/risk relationship. Thus, the current health crisis is likely to impact financial markets as it heralds a socio-economic crisis, changing company valuations and necessitating the management of investors' portfolios to accommodate shifts in the return/risk dynamic.

Significant events can substantially affect stock market returns, as studied under the semi-strong form of the financial market efficiency hypothesis: the stronger the market's reaction to unanticipated news, the greater the market's efficiency. Following Jensen's definition (1978), rather than Fama's (1965), numerous studies have identified major events impacting these returns, such as the Fukushima disasters (Ferstl, 2012), along with corresponding predictability models (Gourio, 2012).

Stock market returns may also be influenced by news of pandemic diseases, such as the Spanish flu (Barro, 2020) or the Severe Acute Respiratory Syndrome (SARS) outbreak (Chen et al., 2007; 2009). However, research into the impact of global pandemic diseases on stock returns was relatively scarce until the year 2020, which saw a surge in relevant scientific literature, with studies like Baker et al. (2020) observing a significant market impact, along with Ramelli and Wagner (2020), Zhang et al. (2020), Gormsen et al. (2020), and Al-Awadhi et al. (2020), to name a few.

We examine the impact of the recent pandemic on MENA stock market outcomes, focusing on the effect of the COVID-19 contagious disease. According to the World Health Organization (WHO), COVID-19 is an infectious disease caused by a newly discovered coronavirus. While most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment, older individuals and those with underlying medical conditions like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more susceptible to serious illness.

The COVID-19 outbreak began in China on December 31, 2019. Chinese authorities alerted the WHO about several cases of illness resembling the flu in Wuhan, the capital of Hubei province, which has a population of 11 million. Patients were quarantined, and health

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authorities began tracing the source of the outbreak (Pharmaceutical Technology, 2020). The first death from the virus was reported on January 11, 2020 (Pharmaceutical Technology, 2020). Table 1 summarizes the major events relating to the COVID-19 outbreak in the world and in the MENA region.

Table 1: Timeline of COVID-19 events in the world and in the MENA region

Dates	Covid-19 events
31/12/2019	Chines government alerts the World Health Organization (WHO) of several flu -like cases in Wuhan.
11/01/2020	The report of the first case of death from Covid-19 in Wuhan, China.
13/01/2020	First corona virus case discovered in Thailand (first infection case outside China).
03/02/2020	The philippines' first Covid-19 death (first death case outside China).
12/02/2020	The highest number of daily new confirmed Covid-19 cases detected in China is 14108.
15/02/2020	First case of corona virus confirmed in Egypt.
24/02/2020	Oman's first Covid-19 case.
02/03/2020	First case of corona virus admitted in Tunisia, Jordan and Morocco.
08/03/2020	The announce of the first Covid-19 death in Egypt.
10/03/2020	First case of confirmed Covid-19 reported in Turkey. First death from coronavirus confirmed in Morocco.
11/03/2020	The WHO announced Covid-19 a global pandemic.
17/03/2020	The report of the first case of death in Turkey.
19/03/2020	The earliest case of death announced in Tunisia.
28/03/2020	Jordan 's first corona virus death.
31/03/2020	First case of death reported in Oman.

Source: the website www.worldometers.info.

The emergence of COVID-19 and its global spread have prompted countries worldwide to implement stringent containment measures and non-pharmaceutical interventions. These actions aim to limit the number of confirmed cases and deaths, and to prevent overwhelming medical systems. The interventions include enhanced diagnostic testing, contact tracing, isolation and quarantine of infected individuals, and critically, measures to curb mobility and enforce social distancing, such as containment strategies and curfews.

While these measures have effectively reduced the number of confirmed cases and deaths, thereby flattening the pandemic curve—as affirmed by Kraemer et al. (2020), Chinazzi et al. (2020), Tian et al. (2020), and Hsiang et al. (2020)—they have also significantly impacted the investment and business environments, initially in China and subsequently worldwide, particularly in the MENA region.

The principal originality of this study lies in examining the effect of contagious infectious diseases, specifically the COVID-19 virus, on MENA stock market returns. We employ a panel regression approach, utilizing two metrics: the daily increase in total confirmed cases and the daily rise in total deaths attributed to COVID-19.

The remainder of this paper is organized as follows: The subsequent section provides a literature review. Section 3 outlines the research methodology. Section 4 presents the data and empirical tests. The paper concludes with Section 5.

2. Literature review

The emergence of COVID-19 and its spread have led many countries around the world to adopt strict containment measures and non-pharmaceutical interventions. These are aimed at limiting the number of confirmed cases and deaths, as well as preventing the medical system from being overwhelmed. Interventions range from improving diagnostic testing and contact tracing to isolating and quarantining those infected, and most critically, implementing measures to reduce mobility and encourage social distancing, such as containment strategies and curfews.

While these measures have contributed to the reduction in the number of confirmed cases and deaths, thereby flattening the pandemic curve—as confirmed by Kraemer et al. (2020), Chinazzi et al. (2020), Tian et al. (2020), and Hsiang et al. (2020)—they have also impacted economic activity. Financial markets, in particular, have experienced dramatic fluctuations on an unprecedented scale.

Recent studies have sought to examine the impact of the COVID-19 pandemic on stock markets. Al Awadhi et al. (2020) analyzed stocks in the Hang Seng Index and the Shanghai Stock Exchange Composite Index during the outbreak in China by adopting panel data regression. Their study period ran from January 10, 2020, until March 16, 2020, and found a negative correlation between the pandemic and stock returns. Specifically, stock returns were significantly and negatively related to the daily increase in both the total number of confirmed cases and the total number of deaths due to COVID-19.

Ashraf (2020) examined the stock market's reaction to the COVID-19 pandemic using daily data on confirmed cases, deaths, and stock returns from 64 countries between January 22, 2020, and April 17, 2020. He observed that stock returns declined as the number of confirmed cases increased in a country. Furthermore, stock markets showed a weak correlation with the increase in the total number of deaths caused by COVID-19. Overall, his analysis indicates that stock markets have been responding quickly to the pandemic, with the response varying over time based on the outbreak's severity.

Topcu and Gulal (2020) investigated the effect of the epidemic on emerging stock markets from March 10 to April 30, 2020, and during three sub-periods using the Driscoll-Kraay estimator. They reported a negative and statistically significant impact on emerging stock markets through April 10, with a greater magnitude observed in March. However, extending the study period to April 17 and beyond showed an insignificant impact, consistent across the full sample period. Additionally, they found that emerging Asian markets were the most affected, whereas European countries experienced the least impact.

He et al. (2020), employing the event study approach, explored the pandemic's impact on stock prices across various Chinese sectors. Their findings indicated that sectors such as transportation, mining, power and heating, and environmental industries were negatively affected. Conversely, the manufacturing, information technology, education, and healthcare sectors not only withstood the pandemic but also displayed strong adaptability. The COVID-19 crisis prompted the manufacturing industry to swiftly increase production of medical equipment like masks and ventilators, thereby bolstering stock market momentum. The success of the Chinese medical team in combating the pandemic and the shift to online education has gradually restored investor confidence in the health and education sectors.

Liu et al. (2020) used an event study approach to calculate abnormal returns within a 10-day period of the outbreak. They found significant declines in the Chinese and Asian stock markets. The results indicated that cumulative abnormal returns (CARs) remained negative throughout the event window periods examined, leading to the conclusion that both the Chinese economy and Asian stock markets were severely impacted by the outbreak. An analysis of industry responses revealed positive CARs for pharmaceutical manufacturing and software and IT services, whereas transport, accommodation, and food industries experienced negative CARs.

Baker et al. (2020) conducted a textual analysis and concluded that the news related to COVID-19 had a more substantial effect on the volatility of the US stock market than other viruses, such as Ebola. They attributed this difference to the impact of government restrictions on mobility and business activity, as well as voluntary social distancing, which are particularly significant in a service-oriented economy.

Alber (2020) studied stock market reactions to the spread of the coronavirus, considering four representative measures of COVID-19 (cumulative cases, new cases, cumulative deaths, and new deaths) and stock market returns in six countries (China, France, Germany, Spain, Italy, and the United States). The findings suggest that stock market returns in China, France, Germany, and Spain are negatively affected by the spread of the virus. Furthermore, the markets appear more sensitive to confirmed COVID-19 cases than to deaths, and to cumulative cases over new cases.

In line with these findings, we propose testing the following two hypotheses on MENA stock markets:

Hypothesis 1: The daily growth in total confirmed cases of COVID-19 has a negative impact on the stock markets.

Hypothesis 2: The daily growth in total death cases has a negative impact on the stock markets.

3. Methodology

We do not have to use classical event study methodologies, such as those established by Fama, Fisher, Jensen, and Roll (1969), because the peak of the disease does not coincide with a single event day. Instead, we observe a bell-shaped curve with a plateau that persists over several days. Baltagi (2008) suggests that panel data regression reduces estimation bias and multicollinearity, controls for individual heterogeneity, and captures the time-varying relationship between dependent and independent variables. Therefore, we apply panel testing to examine the relative performances of stocks in relation to the COVID-19 pandemic.

We estimate stock returns as:

Panel (A)

Model (1): $RETURN_{i,t} = \beta_0 + \beta_1 COVID_{i,t-1} + \epsilon_{it}$

Model (2): $RETURN_{i,t} = \beta_0 + \beta_1 COVID_{i,t-1} + \beta_2 TRADING_{i,t-1} + \epsilon_{it}$

Panel (B)

Model (1): $RETURN_{i,t} = \beta_0 + \beta_1 DEATH_{i,t-1} + \epsilon_{it}$

Model (2): $RETURN_{i,t} = \beta_0 + \beta_1 DEATH_{i,t-1} + \beta_2 TRADING_{i,t-1} + \epsilon_{it}$

where $RETURN_{i,t}$ is the return of stock i at day t , regressed on the lagged values of firm return predictors, which are $COVID_{i,t-1}$ is Daily growth in total confirmed cases of stock i at day $t-1$, $DEATH_{i,t-1}$ is Daily growth in total cases of death of stock i at day $t-1$ and $TRADING_{i,t-1}$ is Daily trading volume standardized of stock i at day $t-1$, as we assume that the COVID's and the DEATH's day figure was given at the end of the day and will impact the market the day after.

4. Data and empirical test results

In this section, we present data and empirical results namely panel estimation results and Panel Granger non-causality tests.

4.1. Data

Our data are based on the number of active confirmed cases and deaths from Coronavirus, trading volume and stock prices of companies' components the representative indices of the Middle East and North Africa markets. The selected MENA regions are six: Turkey, Egypt, Morocco, Tunisia, Oman and Jordan.

Data were obtained from two different sources: financial data were gathered from the website www.investing.com and data related to coronavirus were retrieved at www.worldometers.info.

We use daily data running from the report of the first confirmed COVID-19 case for each country until April 30 2020 as detailed in Tableau 2 below.

Table 2. Sample description

Country	Index components	Study period
Turkey	BIST100	10/03/2020-30/04/2020
Egypt	EGX30	15/02/2020-30/04/2020
Morocco	MASI	02/03/2020-30/04/2020
Tunisia	TUNINDEX	02/03/2020-30/04/2020
Oman	MSM30	24/03/2020-30/04/2020
Jordan	ASE	29/02/2020-30/04/2020

Source: Calculated by the author

Table 3 presents the summary statistics of the data included in our study by country.

As shown below, the maximum daily returns are 0.20 for Turkey, 0.11 for Egypt, 0.10 for Morocco, 0.16 for Tunisia, 0.10 for Oman, and 0.10 for Jordan. The minimum daily returns are -0.20 for Turkey, -0.16 for Egypt, -0.11 for Morocco, -0.21 for Tunisia, -0.12 for Oman, and -0.11 for Jordan, respectively.

The highest daily increases in total confirmed COVID-19 cases reached 4 in Turkey, 1 in Egypt, 1 in Morocco, 1.5 in Tunisia, 1 in Oman, and 9.92 in Jordan.

The highest daily increases in total death cases are 1.25 for Turkey, 1 for Egypt, 1 for Morocco, 0.9 for Tunisia, 0.5 for Oman, and 1 for Jordan.

It is also observed that the number of observations for the daily increase in total death cases is lower than that for the daily growth in total COVID-19 cases due to the time lag between the detection of the first coronavirus case and the subsequent first death case.

Table 3: Descriptive statistics

	Return	Covid	Death	Trading
Case of Turkey				
Mean	0.003632	0.3688921	0.2315451	0.0191233
Std.Dev	0.0465422	0.7136461	0.2957837	1.444237
Min	-0.2	0	0.029746	-16.54909
Max	0.1991295	4	1.25	24.81161
Obs	3564	3564	3069	3564
Case of Egypt				
Mean	-0.0048525	0.0917352	1.376902	0.0293218
Std.Dev	0.0399288	0.152164	0.1892096	2.189528
Min	-0.155633	0	0	-10.69454
Max	0.1127819	1	1	46.13708
Obs	1560	1560	960	1560
Case of Morocco				
Mean	-0.0050844	0.1601234	0.1603886	0.0143142
Std.Dev	0.0289278	0.2154236	0.2787146	0.9890659
Min	-0.105383	0	0	-1.177804
Max	0.0951891	1	1.090909	6.408406

Obs	2795	2795	2145	2795
Case of Tunisia				
Mean	-0.0030175	0.1462927	0.1036434	0.0086242
Std.Dev	0.020019	0.2702249	0.1387725	0.9851966
Min	-0.2135741	0	0	-1.31756
Max	0.1661269	1.5	0.5	6.24903
Obs	2880	2880	1872	2880
Case of Oman				
Mean	-0.0032296	0.1469921	0.0594721	0.0294056
Std.Dev	0.0309206	0.2040567	0.1240799	3.20188
Min	-0.1158318	0	0	-9.420395
Max	0.1009259	1	0.5	43.58578
Obs	1034	1034	667	1034
Case of Jordan				
Mean	0.0002635	0.3184229	0.1094444	0.0386628
Std.Dev	0.0344308	1.482992	0.2339788	1.000458
Min	-0.1053605	0	0	-1.430252
Max	0.0953102	9.916667	1	6.308019
Obs	1892	1892	1100	1892

Source: Authors own creation

To mitigate the issue of multicollinearity, we tested the bivariate correlation of selected variables for each market. The phenomenon of multicollinearity is present only when the correlation coefficient value between two variables exceeds the critical threshold of 0.50.

Table 4 presents the correlation matrix of the data. The correlation coefficients are all below the critical value of 0.5, which confirms the absence of a multicollinearity issue.

Furthermore, correlation analysis indicates that stock market returns are negatively correlated with the daily increase in total confirmed COVID-19 cases.

Similar relationships were found between the daily increase in total death cases and stock returns in four MENA countries: Turkey, Egypt, Morocco, and Tunisia.

Table 4: Correlation matrix

	Return	Covid(-1)	Death(-1)	Trading(-1)
Case of Turkey				
Return	1			
Covid (-1)	-0.3664	1		
Death (-1)	-0.1018	0.9290	1	
Trading (-1)	-0.0495	-0.0791	-0.1613	1
Case Of Egypt				
Return	1			
Covid (-1)	-0.1415	1		
Death (-1)	-0.4097	0.8805	1	
Trading (-1)	0.0870	-0.0208	-0.0217	1
Case Of Morocco				
Return	1			
Covid (-1)	-0.1872	1		
Death (-1)	-0.1149	0.5534	1	
Trading (-1)	-0.0014	0.0247	0.0884	1
Case Of Tunisia				
Return	1			
Covid (-1)	-0.0955	1		
Death (-1)	-0.0303	0.4572	1	
Trading (-1)	0.0187	0.0737	0.0175	1
Case Of Oman				
Return	1			
Covid (-1)	-0.0299	1		
Death (-1)	0.0122	0.4852	1	
Trading (-1)	-0.0512	0.0548	0.0068	1
Case Of Jordan				
Return	1			
Covid (-1)	-0.1754	1		
Death (-1)	0.0338	0.5079	1	
Trading (-1)	0.0469	0.0499	-0.0813	1

Source: Authors' own creation.

4.2. Empirical Test Results

Before estimating the models, we conducted a Hausman specification test (Hausman, 1978) to distinguish between fixed and random effects models.

The results indicate that the Hausman test statistics were all insignificant, which allows us to conclude that the models exhibit random effects (results are available upon request).

Table 5 summarizes the results of our panel regression analysis of all stocks included in the representative indices of selected MENA regions during the COVID-19 outbreak. Panel (A) and Panel (B) present the coefficients of the panel regressions for the daily increase in total confirmed COVID-19 cases and the daily increase in total death cases, respectively.

As anticipated, the daily increase in total confirmed COVID-19 cases had a significant and negative effect on stock market returns.

Furthermore, the daily increase in total death cases had a negative impact on stock returns in Turkey, Egypt, and Morocco. However, this effect was not significant for the markets in Tunisia, Oman, and Jordan, which could be attributed to the lower daily increases observed.

The results concerning the daily increases in confirmed cases and death cases remained similar when trading volume was included as a control variable in Model 2.

The findings also indicate that the impact of the COVID-19 epidemic varies by region.

The effect of the daily increase in total confirmed COVID-19 cases was most pronounced in the Egyptian stock market, while the Tunisian Stock Exchange experienced the least impact.

Moreover, Egypt was the most affected by the daily increase in total COVID-19 death cases, followed by Turkey and Morocco.

Table 5: Panel regression results

	Model (1)	Model (2)
Case of Turkey Panel A		
B	-0.0129485*** [0.000]	0.0131112*** [0.000]
Covid (-1)	-0.0234576*** [0.000]	-0.0238576*** [0.000]
Trading (-1)		-0.0025294 *** [0.003]
Panel B		
B	0.0142439*** [0.000]	0.0148992*** [0.000]
Death (-1)	-0.0128511*** [0.000]	-0.015024*** [0.000]
Trading (-1)		-0.0027437** [0.021]
Case Of Egypt Panel A		
B	-0.0011848** [0.042]	-0.0012668*** [0.004]
Covid (-1)	-0.0370737*** [0.000]	-0.0366143*** [0.000]
Trading (-1)		0.001533 [0.106]
Panel B		
B	0.0167415*** [0.000]	0.0165356*** [0.000]
Death (-1)	-0.0790333*** [0.000]	-0.0788113*** [0.000]
Trading (-1)		0.0009387 [0.251]
Case Of Morocco Panel A		
B	-0.007952 [0.146]	-0.0007949 [0.145]
Covid (-1)	-0.0248193*** [0.000]	-0.0248298*** [0.000]
Trading (-1)		-0.0000928 [0.871]
Panel B		

B	0.0082946*** [0.000]	-0.0010072** [0.041]
Death (-1)	-0.0082946*** [0.000]	-0.0087312*** [0.000]
Trading (-1)		0.0015164*** [0.007]
Case Of Tunisia		
Panel A		
B	-0.0022718*** [0.000]	-0.0022559*** [0.000]
Covid (-1)	-0.0073727*** [0.000]	-0.0075197*** [0.000]
Trading (-1)		0.0005516 [0.203]
Panel B		
B	-0.0003445 [0.579]	-0.0002209 [0.728]
Death (-1)	-0.0040152 [0.225]	-0.0041096 [0.215]
Trading (-1)		0.0009265* [0.081]
Case Of Oman		
Panel A		
B	-0.0025558*** [0.0000]	-0.0026022*** [0.000]
Covid (-1)	-0.00453** [0.036]	-0.0041175* [0.055]
Trading (-1)		-0.00048 [0.234]
Panel B		
B	-0.0078886*** [0.000]	-0.0076664*** [0.000]
Death (-1)	0.0032118 [0.735]	0.00331 [0.729]
Trading (-1)		-0.0004925 [0.242]
Case Of Jordan		
Panel A		
B	0.001547*** [0.0006]	0.0014712*** [0.016]
Covid (-1)	-0.0040726*** [0.000]	-0.0041106*** [0.000]
Trading (-1)		0.0022877*** [0.006]
Panel B		
B	-0.0048243*** [0.000]	0.0047579*** [0.000]
Death (-1)	0.0042929 [0.120]	0.0041772 [0.134]
Trading (-1)		0.0016144* [0.071]

Source: Authors' own creation. Note: Values in square brackets represent the p-values. *, ** and *** denote significance at 10, 5 and 1 per cent levels.

In order to investigate the causal relationships between the daily increase in total confirmed cases and deaths from coronavirus, and stock returns in MENA countries, we employ the Granger Non-causality tests introduced by Dumitrescu and Hurlin (2012). These tests consider the null hypothesis that there is no causal relationship for any of the cross-sectional units (homogeneous Non-Causality hypothesis), against the alternative hypothesis that there is a causal relationship (Heterogeneous Non-Causality hypothesis).

Table 6 presents the results of the Granger non-causality test for the daily increase in total confirmed COVID-19 cases and stock returns.

The causality analysis reveals a unidirectional relationship running from the daily increase in total confirmed COVID-19 cases to stock returns for all regions.

Table 6: Causality test results: Daily growth in total Confirmed COVID-19 cases and stock returns

	W-Stat	Zbar-Stat	Prob
Case of Turkey			
Covid → Return	11.7510	2.87725	0.0000***
Return → Covid	2.83380	-1.40867	0.1589
Case Of Egypt			
Covid → Return	0.46700	-2.07024	0.0384**
Return → Covid	0.59457	-1.61216	0.1069
Case Of Morocco			
Covid → Return	3.56862	13.01522	0.000***
Return → Covid	1.13817	0.43663	0.6624
Case Of Tunisia			
Covid → Return	1.41536	1.93186	0.0534*
Return → Covid	0.79037	-1.45460	0.1458
Case Of Oman			
Covid → Return	0.41279	-2.14703	0.0318**
Return → Covid	0.55560	-1.66493	0.1103
Case Of Jordan			
Covid → Return	11.1447	4.41988	0.000***
Return → Covid	8.72400	1.28033	0.2004

Source: Authors own creation. Note. *, ** and *** imply significance at 10, 5 and 1 percent levels.

Table 7 shows the causal relationship between the daily growth in total death cases and stock returns.

We found that daily growth in total death cases from coronavirus granger caused stock returns in Turkey Egypt and Morocco. However, no causal relationship exists between the variables in Tunisia, Oman and Jordan.

Table 7: Causality test results: Daily growth in total death cases and stock returns

	W-Stat	Zbar-Stat	Prob
Case of Turkey			
Death → Return	2.21686	6.96566	0.0000***
Return → Death	1.20988	0.79578	0.4262
Case Of Egypt			
Death → Return	4.94261	13.1017	0.0000***
Return → Death	1.27627	0.67496	0.4997
Case Of Morocco			
Death → Return	2.76928	2.06266	0.0391**
Return → Death	0.25613	0.72909	0.2093
Case Of Tunisia			
Death → Return	1.06899	-0.15660	0.8756
Return → Death	1.04514	-0.27706	0.7817
Case Of Oman			
Death → Return	1.12129	0.01094	0.9913
Return → Death	1.37189	0.76300	0.4455
Case Of Jordan			
Death → Return	5.20264	-1.29105	0.1967
Return → Death	6.07063	-0.37696	0.7062

Source: Authors own creation. Note. *, ** and *** imply significance at 10, 5 and 1 percent levels.

5. Conclusion

This study has examined the stock market reaction to the COVID-19 outbreak in six MENA regions, employing daily coronavirus-confirmed cases and deaths, trading volume, stock returns, panel random effect regression, and Granger Non-causality tests.

Panel regression results indicate that the COVID-19 outbreak negatively correlates with

stock market returns during the pandemic across all examined countries.

The results also suggest that the impact of the COVID-19 epidemic in MENA regions varies by country. The daily increase in total confirmed COVID-19 cases had the most substantial effect on the Egyptian stock market, while the Tunis Stock Exchange experienced the lowest impact.

Furthermore, Egypt was the most impacted by the daily increase in total COVID-19 death cases, followed by Turkey and Morocco.

It could be said that this crisis has demonstrated a relative reaction of certain financial markets to their environments, which could be interpreted as evidence of greater efficiency, while others appear to exist in a relatively insensitive 'ivory tower.'

Moreover, causality analysis reveals that the daily increase in total confirmed COVID-19 cases and deaths Causes stock returns.

We conclude that the stock markets of the MENA countries have been strongly affected by the global coronavirus pandemic. Governmental measures such as quarantine and curfew, aimed at reducing individual mobility and flattening the pandemic curve, have led many companies to operate below full capacity. This has resulted in a drastic reduction in production and sales, thereby lowering expected future cash flows. Thus, COVID-19 represents a significant shock to the economies of the MENA regions and is causing investors to re-evaluate their investment choices, particularly as stock prices reflect the potential of future cash flows.

Additionally, the extensive media coverage of the coronavirus outbreak has fostered mistrust and uncertainty among domestic and foreign investors, consequently diminishing investment capacity.

The number of confirmed COVID-19 cases and deaths could be considered a warning signal to financial market participants for risk management of equities and investment portfolios. Investing in healthcare emerges as the main challenge to restoring the confidence that is currently lacking in stock markets.

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