THE NEXUS BETWEEN COVID-19 AND STOCK RETURNS: EVIDENCE FROM SELECTED MENA COUNTRIES*

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ABSTRACT

This study investigates the relationship between COVID-19 measured by growth in number of weekly confirmed new cases and stock returns of the major indices in selected Middle East and North Africa (MENA) countries. To test the influence of COVID-19 on stock returns, this study uses panel data methodology using weekly data between 19 March 2020 and 31 December 2020. Contrary to expectations, our findings fail to demonstrate a significant link between stock market index returns and COVID-19, which is proxied by the growth in weekly confirmed new cases. Additionally, regarding the control variables, whereas no relationship is documented between Chicago Board Options Exchange Volatility Index (VIX) and selected countries' stock index returns, 5-year Sovereign Credit Default Swap (CDS) figures of the selected countries are found to be negatively and significantly related with the main variable of interest.

Keywords: COVID-19, MENA Countries, Panel Data, Stock Return

JEL Classification: C33, E44, I15

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COVID-19 VE HİSSE GETİRİLERİ ARASINDAKİ İLİŞKİ: MENA ÜLKELERİ ÖRNEĞİ

ÖZ

Bu çalışma ile seçili Orta Doğu ve Kuzey Afrika Ülkeleri'ne (MENA) ait ana hisse senedi endeks getirileri ile COVID-19 göstergesi olarak kullanılan haftalık vaka sayılarındaki artış arasında bir ilişki olup olmadığı araştırılmıştır. COVID-19'un borsa endeks getirileri üzerindeki etkisini test etmek için 19 Mart-31 Aralık 2020 tarihlerini kapsayan dönemde haftalık veri seti kullanılarak panel veri analizi uygulanmıştır. Beklenenin aksine, vakalardaki haftalık artış ile ölçülen COVID-19 ve hisse senedi Endeks getirisi arasında anlamlı bir ilişki bulunamamıştır. Kontrol değişkenlerine ait sonuçlar ise korku endeksi olarak bilinen volatilite endeksinin (VIX) hisse senedi getirisi üzerinde anlamlı bir etkisinin olmadığını, kredi temerrüt takası olarak bilinen CDS değerleri ile endeks getirisi arasında ise anlamlı ve negatif bir ilişki olduğunu göstermiştir.

Anahtar Kelimeler: COVID-19, Orta Doğu ve Kuzey Afrika Ülkeleri (MENA), Panel Veri, Hisse Senedi Getirisi

JEL Sınıflandırması: C33, E44, I15

GENİŞLETİLMİŞ ÖZET

AMAÇ VE MOTİVASYON

Bu çalışmanın amacı Bahreyn, Mısır, İsrail, Umman, Katar, Suudi Arabistan, Tunus ve Birleşik Arap Emirlikleri'nin dahil olduğu Orta Doğu ve Kuzey Afrika ülkelerine ait temel borsa endeksleri üzerinde COVID-19'un etkisini araştırmaktır. Konu ile ilgili veriye genellikle gelişmiş ülkelerde ulaşmak daha kolay olduğundan, seçtiğimiz Orta Doğu ve Kuzey Afrika bölgesine ait çalışmalar daha sınırlı kalmıştır. Bu çalışma ile ampirik olarak görece daha az araştırmanın yapılmış olduğu bu bölge hakkında yeni bulgular sunularak literatüre katkı sağlanması hedeflenmiştir.

ARAŞTIRMA STRATEJİSİ VE YÖNTEMİ

COVID-19 pandemisinin ortaya çıkışı ile birlikte özellikle finansal piyasaların ve borsaların nasıl etkilendiği ile ilgili kısa sürede birçok çalışma yapılmıştır. Aşıların bulunup uygulanmasından önceki dönemde, farklı ülke ya da ülke grupları veya bölgeler için farklı zaman aralıklarında yapılan çalışmaların çoğu COVID-19'un hisse getirileri üzerinde negatif etkisinin olduğunu göstermiştir. Bu amaçla, seçili Orta Doğu ve Kuzey Afrika ülkelerindeki temel borsa endekslerinin COVID-19'dan nasıl etkilendiğini ortaya çıkarmak için panel veri yöntemi kullanılmıştır. Bu yöntemin avantajlarından biri kesit analizi ile zaman serisi analizini birleştirmesidir. Bu çalışmada seçili ülkelerin haftalık endeks ve COVID-19 bilgileri kullanılarak kesit ve zaman boyutları birleştirilmiştir. Literatürde panel veri analizi kullanarak bu alanda yapılmış çalışmalar mevcuttur (Ben-Ahmed et al., 2022; Karim and Saba, 2021;

Ashraf, 2020; Arafa and Alber, 2020). 19 Mart 2020 ve 31 Aralık 2020 tarihleri arasında seçili ülkelerdeki hisse senedi piyasasının nasıl etkilendiğini ölçmek için gerekli veriler Thomsen Reuters ve Dünya Sağlık Örgütü veri tabanlarından çekilmiştir.

BULGULAR VE TARTIŞMA

Literatürde yer alan birçok çalışmanın aksine, 19 Mart 2020 ve 31 Aralık 2020 tarihleri arasında Orta Doğu ve Kuzey Afrika ülkelerinde COVID-19'un seçili borsa endeks getirileri üzerinde anlamlı bir etkisinin olmadığı yapılan analiz sonucunda ortaya konulmuştur. Sınırlı zaman içerisinde, literatürde bu konuda yapılan birçok çalışmada COVID-19 göstergesi olarak vaka veya ölüm sayılarının farklı zaman frekanslarındaki büyüme oranları veya kümülatif değerler toplamının kullanıldığı gözlemlenmiştir (Asraf, 2020; Arafa and Alber, 2020; Xu, 2021; Karim and Saba, 2021). Konu ile ilgili literatürde yer alan çalışmalar incelendiğinde, ilgili değişkenler arasında anlamlı ve negatif yönlü bir ilişkinin olduğu tespit edilmiştir. Ashraf (2020)'nin COVID-19 göstergesi olarak günlük vaka ve ölümlerdeki artışın 64 ülkeye ait seçili borsalar üzerindeki etkisini araştırdığı kapsamlı ve öncü çalışma bulguları, yaşanan pandeminin borsa getirileri üzerinde incelenen dönemde negatif etkisinin olduğunu göstermiştir. G-20 ülkelerini içeren kapsamlı bir diğer çalışmanın sonucu COVID-19'un analizin gerçekleştirildiği dönemde, ülke borsaları üzerinde benzer şekilde negatif etkiye sahip olduğunu ortaya çıkarmıştır (Singh vd. 2020). Arafa ve Alber (2020) de bu çalışmanın konusu olan Orta Doğu ve Kuzey Afrika ülkelerindeki borsaların yaşanan son pandemiden ne şekilde etkilendiğini incelemişlerdir. Şu andaki çalışmadan farklı olarak analiz periyodu 1 Mart – 24 Temmuz 2020 dönemini kapsayacak şekilde daha kısa sürelidir. Daha önceki birçok çalışmada olduğu gibi bu çalışmada da COVID-19'un endeks getirisi ile ölçülen borsalar üzerindeki etkisi negatif yönlü tespit edilmiştir. Kontrol değişkeni olarak analize dahil edilen kredi temerrüt takası (CDS) değişkeni ile endeks getirisi arasında anlamlı ve negatif ilişki gözlemlenmiştir. Bir diğer kontrol değişkeni olan ve korku endeksi olarak bilinen VIX endeksi ile endeks getirileri arasında ise anlamlı bir ilişki tespit edilememiştir.

SONUÇ VE ÖNERİLER

Beklenenin aksine, incelenen dönemde COVID-19 ve seçili Orta Doğu ve Kuzey Afrika ülkeleri endeks getirileri arasında anlamlı bir ilişki bulunamamıştır. Bu sonuçta gelişmekte olan ülkelerdeki COVID-19 vaka ve ölüm sayılarının raporlanması ile ilgili potansiyel sorunların etkisi olabileceği göz ardı edilmemelidir. Kontrol değişkenleri ile ilgili sonuçlar ise CDS (kredi temerrüt takası) ile endeks getirisi arasında anlamlı negatif bir ilişkinin olduğunu göstermiştir. Ancak, VIX endeksinin (korku endeksinin) getiri üzerinde anlamlı bir etkisinin olmadığı gözlemlenmiştir.

Gelecekte yapılacak çalışmalarda, COVID-19'u temsilen ölüm sayısı gibi farklı göstergelerin borsa getirisi üzerindeki etkisi incelenebilir. Haftalık veri seti ile yapılan çalışma, günlük veya aylık zaman

aralıkları kullanılarak tekrarlanabilir. Tüm bunlara ek olarak zaman ilerledikçe COVID-19 ile ilgili daha fazla veriye ulaşılabileceğinden daha uzun dönemli çalışmalar farklı bölge ve ülke piyasaları için yapılabilir.

1. INTRODUCTION

Earlier research demonstrates that stock markets are sensitive to major and unexpected events such as political events (Malik et al. 2009; Obradović and Tomić 2017), environmental events and news (Guo et al. 2020; Xu et al. 2012), terrorist attacks (Aslam and Kang 2015; Brounen and Derwall 2010), disasters (Bourdeau-Brien and Kryzanowski 2017; Kowalewski and Spiewanowski 2020), and diseases like Severe Acute Respiratory Syndrome (SARS) (Chen et al. 2007; Nippani and Washer 2004), Ebola Virus Disease (EVD) (Ichev and Marinc 2018).

Since the end of December 2019, almost all countries in the world have been affected by the recent coronavirus pandemic that first appeared in Wuhan, the capital of China's Hubei Province. Even though this respiratory disease, which is known as COVID-19, was first seen in China, it spread to other regions in the world with the number of cases and deaths quickly rising. Consequently, on March 11, 2020; World Health Organization (WHO) declared COVID-19 as a pandemic (WHO 2020, 2). Being immune to this virus is regarded as a necessity to put an end to this pandemic and vaccination is suggested to be the safest way to achieve this by health-care professionals. Accordingly, the vaccination development efforts have quickly started in the world and these efforts proved to be successful within less than a year since the outbreak of the pandemic. As of November, 2021 with a total of 7.31 billion doses in the world; the part of the population that has received at least one dose of COVID-19 vaccine is reported to be 51.1% with the striking inequality that this percentage is only 4.2% of the population in low-income countries (https://ourworldindata.org/covid-vaccinations). Additionally, based on the reports of WHO, the numbers of confirmed cases and deaths are reported to be more than 250 and 5 million, respectively (World Health Organization 2021).

As COVID-19 spread around the globe, the severe consequences of this virus are observed not only on the human health but also on the economies of both developed and developing countries. The economic burden arising due to issues like additional costs on the healthcare system, decline in workplace productivity, loss of jobs, closure of country borders, and restrictions in travel have triggered a worldwide economic turmoil that is assumed to go on for an unpredictable period. Furthermore, uncertainty and risk together with this economic turmoil have a potential to influence financial markets. Accordingly, quickly after COVID-19 has been declared as a pandemic, together with the emergence and availability of data such as confirmed cases and deaths due to novel coronavirus, researchers have started to conduct studies to reveal the impact of the virus on the financial markets majorly focusing on stock markets. Some of the pioneering empirical studies can be named as those of Ashraf (2020), Singh

et al. (2020), Ashraf (2021), and Herwany et al. (2021) that will be provided in the literature review section in detail below.

The aim of this study is to investigate the impact of COVID-19 on returns of major stock indices of Middle East North Africa (MENA) countries; namely, Bahrain, Egypt, Israel, Oman, Qatar, Saudi Arabia, Tunisia, and United Arab Emirates with the use of panel data analysis. The major reason why this region is studied rests upon the fact that there are relatively fewer studies in this area of research mainly because of data availability problems in comparison to the developed markets. Since data for all MENA countries cannot reliably be reached, only the above stated list of countries is included in the empirical analysis. The period of the empirical study is chosen to be between 19 March 2020, and 31 December, 2020 to generate a common basis for a balanced dataset for the selected countries and eliminate the potential impact of vaccination on stock markets. While the proxy for the recent virus is chosen to be growth in number of weekly confirmed new COVID-19 cases in the selected country, the dependent variable is determined to be weekly index returns.

Section 2 provides a literature review on the relationship between increases in COVID-19 cases and stock market returns from various regions around the world. Section 3 discusses the methodology explaining the model, data and variables utilized, and the research design. The paper then presents the findings of the empirical analysis, and concludes with discussions, concluding remarks, and suggestions for further studies.

2. LITERATURE REVIEW

Numerous studies have been performed in the short period following the outbreak of the recent COVID-19 pandemic with a major emphasis on how stock returns are affected. One of the pioneering and comprehensive studies including 64 countries' stock indices is conducted by Ashraf (2020) for the period between January 22 and April 17, 2020. Ashraf found that daily growth in confirmed COVID cases and number of deaths have negative effect on the stock market returns. It is also found that the effect of increase in cases is greater than increase in the number of deaths. He also observed that in the early days of sample period and between the 40th and 60th days the negative influence is stronger. Another study with a wide dataset conducted by the same author takes the potential influence of national culture into account. This study provides confirmative findings as to the negative impact of the pandemic measured by growth in confirmed cases on stock returns on a dataset of 43 countries. Furthermore, this impact is observed to be stronger in countries with higher level of national-level of uncertainty avoidance (Ashraf 2021).

A cross-country study conducted by He et al. (2020) investigates the direct and spill-over effects of COVID-19 on the most representative stock indices from 8 countries, namely; China, Italy, South Korea,

France, Spain, Germany, Japan, and United States for the period between June 1, 2019 and March 16, 2020. The findings reveal a negative effect of COVID-19 on the selected countries being not more than the global average. Furthermore, spill-over effects between Asia, Europe, and the United States have been observed to be bidirectional. Another cross-country research investigating the impact of COVID-19 on stock returns of top 30 countries, which experience the highest number of confirmed cases as of April 24, 2020; reveal stock market returns to be significantly and negatively influenced by the recent pandemic (Bash 2020). One further comprehensive study conducted on a dataset made up of G-20 countries to analyze the influence of COVID-19 on stock markets is that of Singh et al. (2020) with the finding that all selected stock markets are inversely influenced in the post COVID-19 outbreak. However, a recovery of stock markets is observed in the later periods of the pandemic.

A study that focuses on the same region; namely, MENA, as our study is that of Arafa and Alber (2020). They utilize cumulative total cases and deaths together with new cases and deaths as proxies for the coronavirus and explore how stock market returns of selected MENA countries are influenced by COVID-19 for the timespan between March 1 and July 24, 2020, which is a shorter time span than that of the current study. In line with most prior studies, a negative relationship between the variables of interest is documented. Takyi and Bentum-Ennin (2021) conduct a similar study on 13 African countries for a longer period between October 2019 and June 2020. Overall evidence suggests that the recent pandemic deteriorates market performance of most of the selected countries in the study. Whereas no significant influence is detected in the stock markets of three countries in the dataset, remaining markets have been found to be negatively affected.

Alzyadat and Asfoura (2021) aim to evaluate the Saudi Arabian stock market, namely; Tadawul All Share Index (TASI) to observe how the recent global pandemic affects the daily stock returns for the time span from March 15, 2020 to August 10, 2020. Whereas a negative influence of COVID-19 on the selected stock market has been observed in the initial period of the pandemic, this impact is found to decline in time. The reason as to this finding is stated to be the timing and size of Saudi Arabia's governmental stimulus packages.

A research performed with event study methodology utilizes a dataset of 364 listed firms in Vietnam to evaluate the potential influence of COVID-19 on abnormal stock returns. The overall findings of the analysis demonstrate that the recent pandemic affects stock returns in that industry-wise abnormal returns are found to be different with the utilization of three event windows. Accordingly, whereas the abnormal stock returns are not found to be great in the first phase, they turn out to be negative in the second phase. However, these abnormal stock returns are found to be positive in the third phase due to social distancing practices and psychological adaptation though being still lower than the pre-COVID-19 period (Ngoc et al. 2021). Another paper with event study methodology is performed by Herwany et al. (2021) on the Indonesian Stock Exchange to reveal the influence of the recent pandemic on existing

industries. The empirical analysis is conducted on 9 sectors. The study utilizes 30-day event windows with the overall analysis period of the study being divided into 2 sub-periods; namely, January 20, 2020, to February 28, 2020; and March 3, 2020, to April 15, 2020. The findings demonstrate that the abnormal returns in financial property, real estate, and construction sectors have decreased in both pre and post 30-day period. Furthermore, the sectors that are not affected by the pandemic are determined to be infrastructure, utilities, and transportation sectors. However, the remaining sectors of the sample experience increased abnormal returns. In summary, the listed stocks in Indonesia are affected by the recent global pandemic, with the overall impact being negative and significant.

Another study conducted with a sectoral perspective is that of Karim and Saba (2021). It focuses on 13 sectors of Dhaka Stock Exchange of Bangladesh to investigate the relationship between COVID-19 and stock returns. The study proxies the recent pandemic with the daily change in the number of confirmed cases and deaths. It shows that almost all sectors are negatively influenced by the cases proxy for the period between March 8, 2020, and September 15, 2020. The sectors that are most severely influenced by both proxies are banking and textile industries. Contrarily, pharmaceuticals and chemicals industry is found to be positively affected by COVID-19 together with the insurance sector.

A study conducted on West African Economic and Monetary Union (WAEMU) utilizes event study methodology based on a GARCH process. The countries included in the study are Benin, Burkina Faso, Ivory Cost, Guinea-Bissau, Mali, Niger, Senegal, and Togo. The dataset comprises 42 listed companies, 3 sectoral indices; namely industry, finance, and distribution together with BRVM composite benchmark index, which is a regional stock exchange serving the before mentioned countries. Two event dates; namely, January 23, 2020, and March 2, 2020 are selected to investigate the association between COVID-19 and stock returns in WAEMU stock market. The first event date, which is the first COVID-19 death case in China, demonstrated a minor effect on the selected regional stock market. However, the second event date, which is the first COVID-19 case in WAEMU, has a strong and negative effect. This negative affect is more experienced by the distribution sector when compared with the other selected sectors. Furthermore, death cases are found to be the ones that disturb the market but not the confirmed cases (Zoungrana et al. 2021).

Depending on the fact that hospitality industry has been severely and negatively influenced by COVID-19 due to travel restrictions, Lee et al. (2021) investigate the possible impact of the virus on the Chinese hospitality stock returns and macroeconomic indicators. The period of the study is between January 13, 2020 and May 11, 2020. While COVID-19 is measured by daily new and total confirmed cases, macroeconomic fluctuations are proxied by exchange rates, interest rates, and stock market returns. An important finding is that macroeconomic fluctuations and hospitality stock returns are majorly influenced by COVID-19 shocks. The unpredicted spread of the pandemic positively and significantly influences the exchange rates, while negatively influencing stock market and hospitality

returns. Furthermore; when home country currency depreciates, stock market returns are found to be negatively influenced. Lastly, an increase in stock market returns is found to be negatively associated with exchange rates and positively associated with hospitality industry returns.

Waheed et al. (2020) utilize the period between February 26, 2020 and April 17, 2020 to examine how Karachi Stock Exchange of Pakistani is affected by COVID-19 outbreak. Contrary to most of the studies in this array of literature, a significant increase in the selected index is detected. The major reason of this finding is adhered to the government's timely interventions protecting investors from the adverse effects that could be observed in the stock markets due to the recent pandemic. A comprehensive study with contradictory findings conducted by Ben-Ahmed et al. (2022) evaluates the relationship between COVID-19 and stock returns of 90 top digital companies from 24 countries. The findings reveal the significant and positive influence of monthly growth in total cases and total deaths on the stock returns of digital companies for the time span from January 1 to July 17, 2020. This novel finding shows that the digital sector has prospered in comparison to others during the recent global pandemic.

As the literature review demonstrates for the period before the vaccines have been developed and applied, stock returns are negatively influenced by COVID-19 in most of the studies, which utilize a dataset belonging to a specific single-country, multi-country, or a specific region.

3. METHODOLOGY

This study utilizes panel data methodology to reveal the possible influence of COVID-19 on the stock returns in the major indices of selected MENA countries. One of the advantages of panel data methodology is that it combines both cross-sectional and time-series data in the form of indices and weeks, respectively. It has to be stated that biased results can be reached when there is heterogeneity with the use of only one of these dimensions. However, panel data methodology can overcome this deficiency. Additionally, the problem of multi-collinearity can be reduced with this methodology's utilization. Further superiorities of this method stem from the fact that it allows more variability, informativeness, and higher degrees of freedom besides its ability to overcome heterogeneity and multi-collinearity (Baltagi 2013; Wooldridge 2002). Some of the other studies that similarly utilize panel data methodology in this array of literature to reveal the impact of COVID-19 on stock returns can be named as those of Ben-Ahmed et al. (2022), Karim and Saba (2021), Ashraf (2020), and Arafa and Alber (2020).

3.1. Data and variables

This study incorporates major indices of the stock markets belonging to selected MENA countries; namely, Bahrain, Egypt, Israel, Oman, Qatar, Saudi Arabia, Tunisia, and United Arab Emirates. Data availability issue is the main reason for country selection. To evaluate how stock markets react to the

novel coronavirus, stock index returns are calculated weekly on a timespan between 19 March 2020, and 31 December, 2020. The reason for selecting this period rests upon several facts; namely data availability as to the main variables of interest, growth calculation that will be used for the variable related to COVID-19, and finding a common basis to generate a balanced dataset for the selected countries. The data belonging to the MENA country indices, and the control variables are extracted from Thomsen Reuters Database. Not all but the major indices of the selected countries are chosen for the evaluation of the impact of COVID-19 on stock returns due to data availability issues belonging to the aforementioned well-established international database. Furthermore, World Health Organization database is used to retrieve data belonging to related COVID-19 proxy. Table 1 demonstrates the selected major indices together with the countries and regions they belong to.

Table 1. Regions, Countries, and the Indices

Region	Country	Index
Asia	Bahrain	BAX
Africa	Egypt	EGX30
Asia	Israel	TA35
Asia	Oman	MSI
Asia	Qatar	QSI
Asia	Saudi Arabia	TASI
Africa	Tunisia	TUNINDEX
Asia	United Arab Emirates	DFMGI

The dependent variable of the model is determined to be weekly returns of the above stated indices calculated from closing index values. Studies that explore the potential influence of COVID-19 on stock returns majorly utilize growth in number of confirmed new COVID-19 cases and deaths or cumulative confirmed cases and deaths with different frequencies in recent literature (Asraf, 2020; Arafa and Alber, 2020; Xu, 2021; Karim and Saba, 2021). In this study, growth in number of weekly confirmed new COVID-19 cases in the selected countries is chosen to be the explanatory variable of the analysis to proxy for the recent pandemic.

Since the Credit Default Swap (CDS) of the countries, which are related with the risk of default on debt securities, have a potential to influence stock index returns; weekly CDS of each country calculated from 5-year debt securities are incorporated into the model as a control variable. In literature, studies focusing on stock returns have embedded CDS figures into the empirical analysis since the CDS market is considered to display mixed results as to the informational role on the stock market (Yang and Samitas, 2020). Furthermore, there are studies that reveal the existence of a relationship between stock returns and CDS (Trutwein et al., 2011; and Kapadia and Pu, 2012).

Additionally, Chicago Board Options Exchange Volatility Index (VIX) is utilized as the second control variable. This indicator, which is introduced by Whaley (1993), is also known as the investment fear index and is related with the risk and fear in the stock markets. As emphasized by Whaley (2000), a high level of VIX is found to be interrelated with high levels of market turmoil and volatility in U.S equity markets. Accordingly, it is regarded to be an indicator of the investor fear gauge. Whaley (2009) further states VIX to be an index measuring volatility which is forward looking and measuring the volatility that investors expect to see. The relationship between this barometer of investor fear and stock market returns have been empirically analyzed in literature. An example is the study of Sarwar (2012), which shows a negative link between VIX index and stock market returns. Furthermore, the relationship is found to be stronger when VIX is more volatile in the US stock market. This negative relationship has also been documented for China, Brazil, and India. Accordingly, Table 2 displays the summary of the variables in the model together with their abbreviations.

Table 2. Variables and Their Abbreviations

Abbreviation	Variable
RETURN	Weekly index return
GWCASE	Growth in number of weekly confirmed new COVID-19 cases in the selected country
CDS	5-year Sovereign Credit Default Swap of the selected country
VIX	Chicago Board Options Exchange Volatility Index

3.2. Research design

Accordingly, the functional representation of the model is expressed as below;

$$RETURN = \beta_0 + \beta_1 GWCASE + \beta_2 CDS + \beta_3 VIX + \epsilon$$

The first test run to determine the estimator of the model is Likelihood-ratio (LR) Test, which results in the existence of unit and/or time effects denoting that the model is not classical. Additional LR test shows that the model is a one-way model with time effects. Further analysis with Hausman test reveals the suitability of random effects. In order to test for the basic assumptions of panel data methodology, additional tests are run. The findings of Levene, Brown and Forsythe's Test show the presence of heteroskedaticity. Then, Lagrange Multiplier and Adjusted Lagrange Multiplier tests are conducted with the findings denoting that the model has autocorrelation. Lastly, Frees' test reveals the existence of cross-sectional independence. Accordingly, the model is estimated with Driscoll-Kraay standard errors due to the presence of heteroskedasticity, autocorrelation, and cross-sectional independence (Tatoğlu 2020, 338-339).

4. EMPIRICAL FINDINGS

The results of the analysis, which is conducted to evaluate the impact of growth in number of weekly confirmed new COVID-19 cases on index returns of selected MENA countries, are displayed on Table 3 below.

Table 3. The Results of the Panel Data Analysis

Random-effects GLS regression			
Dependent Variable: RETURN			
Variables	**Coefficient**	**Standard Error**	**t statistics**
GWCASE	.0010107	.0009291	1,09
CDS	-.0000128***	.0000026	-4.93
VIX	-.0003829	.0005260	-0.73
constant	.0176716	.0151119	1,17
Number of observations	336		
Number of groups	42		
Wald chi2(9)	53.81		
Prob > chi2	0.0000		
legend	** p<0.10;*	*** p<0.05;*	****p<0.01;*

Contrary to the expectations, growth in number of weekly confirmed new COVID-19 cases observed in MENA countries is found to exert no influence on the selected stock indices for the period between 19 March 2020, and 31 December, 2020. The impact of country CDS figures, which are used to control for financial and macroeconomic instability acting as a proxy for risk, on index returns is negative and significant in line with the expectations. Finally, VIX index that is also known as the fear index, is documented to have no significant relationship with the index returns of the selected countries for the observation period.

5. CONCLUSION

The purpose of this study is to analyze the link between COVID-19 and stock returns in MENA countries. Accordingly, an empirical analysis is conducted with panel data methodology to probe the nexus between COVID-19 measured by growth in number of weekly confirmed new COVID-19 cases and weekly stock returns of the major indices on selected MENA countries. Contrary to expectations, no significant link is documented between the selected proxy for the coronavirus and stock index returns in MENA countries for the period under question. It has to be noted that this insignificant result can arise due to the potentially questionable data reporting as to COVID-19 case and death figures specifically in developing countries. Furthermore, this insignificant finding as to the main variable of interest should not strictly be perceived as that COVID-19 does not influence financial markets of the

MENA countries, specifically stock markets. If the dataset could be collected on an industrial basis, that was not available for the study under question for the selected period analyzed, a potential influence of the recent pandemic on stock markets might be revealed in certain industries. With respect to the findings as to the control variables, it is seen that index returns and CDS figures are negatively and significantly correlated. However, no relationship has been detected for the case of VIX index.

Further empirical work can utilize different indicators formed with death numbers arising due to the recent pandemic. The frequency of COVID-19 proxies can also be changed; namely, daily or monthly numbers can be used. In addition to these, studies covering a longer period can be conducted due to the increase in the amount and availability of data as time passes since the beginning of the pandemic. Furthermore, data from other regions or countries can be utilized to evaluate the impact of COVID-19 on various financial markets.

YAZARLARIN BEYANI

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