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Bank Stock Return Reactions to the COVID-19 Pandemic: The Role of Investor Sentiment in MENA Countries

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Abstract: In this study, we investigated the impact of COVID-19 investor sentiment (CS), number of cases (CC), and deaths (CD) on bank stock returns in 16 MENA countries. In addition, we examined the interaction effects of CS with CC and CD on bank stock returns. Lastly, we looked at whether Islamic banks outperformed conventional banks during the pandemic. Based on monthly data from the Middle East and North Africa (MENA) countries from February 2020 to July 2021, we used the clustered standard error fixed effect estimation on Islamic and conventional bank stock market returns. The results suggest that CC and CD have negative impacts on bank stock market returns while CS has no effect, except for the lagged value. The interaction effect of CS with CC and CD on stock returns proved to strengthen the link in the current month and weaken the link in the previous month.

Keywords: COVID-19; bank return; MENA countries; Islamic banks

JEL Classification: G01; G10; G15

1. Introduction

Studies on the economic impacts of infectious diseases are not new. For example, previous studies have examined the negative effects of SARS and the avian flu on stock markets in different countries (Chen et al. 2007; Chen et al. 2009; McAleer et al. 2010; Yang and Chen 2009). However, the COVID-19 pandemic has had a far more prominent impact worldwide than all other viruses since the great influenza epidemic of 1918 (Spanish flu). The COVID-19 pandemic brought many economies to a complete stop. It caused people to lose their jobs, firms to incur significant losses, and governments to increase their healthcare spending to combat the pandemic. The financial sector was one of the most affected sectors, specifically stock markets. Stock markets worldwide have suffered significant losses since the outbreak of the pandemic. For example, the Dow Jones Industrial Average, FTSE, and the S&P 500 lost 20–25% of their value (Frezza et al. 2021). These figures were "topped" by Germany's DAX, which experienced a 36% loss. Overall, global stock market losses approached USD 20 trillion in the first quarter of 2020. Similarly, other stock exchanges were impacted worldwide (Corbet et al. 2021; Zhang et al. 2020; Xu 2021). Previous studies found that the COVID-19 pandemic had negatively impacted the banking sector (Demirgüç-Kunt et al. 2021; Demir and Danisman 2021; Elnahass et al. 2021). However, while Islamic banks appeared to be exposed to more risks, they performed better than conventional banks (Musa et al. 2020; Elnahass et al. 2021; Danisman et al. 2021).

Intense media coverage concerning the daily number of COVID-19 cases and related deaths has led to the introduction of regulatory policies, such as lockdowns and quarantines, to prevent the spread of the disease. Recent studies have found a negative impact regarding COVID-19 cases and deaths on stock market performance (Ashraf 2020a; Xu 2021;

Al-Awadhi et al. 2020). The fast spread of the virus worldwide, coupled with the afore-mentioned social media interactions, strongly increased economic and pandemic-related uncertainty (Baker et al. 2020; Ashraf 2020a; Xu 2021; Valaskova et al. 2021; Watson and Popescu 2021). Most previous studies were carried out in a single country (Al-Awadhi et al. 2020; Narayan et al. 2020) or via an international sample (Alexakis et al. 2017; Bouri et al. 2021). The gap in the existing research motivated us to investigate the impact of COVID-19, investor sentiment, cases, deaths, and uncertainty in bank stock returns in the Middle East and North Africa (MENA) region.

The MENA countries are known for their similar cultural values, ethnic identity, and social norms (Masoud and Albaity 2021; Ayadi et al. 2015; Lassoued et al. 2018, 2016; Pitlik and Rode 2017). Similarly, the MENA region has been classified as a collectivistic community based on group-oriented decision-making (Kabasakal and Bodur 2002; Pitlik and Rode 2017). In addition, the MENA region has been ranked second, after the East Asia region, in terms of banking industry development (Masoud and Albaity 2021; Bourgain et al. 2012; Anzoategui et al. 2010). Lastly, the majority of MENA countries have been classified as oil-rich economies representing 65% of the world's oil reserve, which might suggest why the impact of the COVID-19 pandemic might be different than for other countries (Albaity et al. 2020; Mertzanis et al. 2019; Mohamed et al. 2015).

Hence, the objectives of this study are as follows. First, in this paper, we investigated the impacts in the change of COVID-19 investor sentiment, cases, and deaths on bank stock returns in MENA countries. Second, in this paper, we investigated the interaction effects regarding the change of COVID-19 investor sentiment with the number of cases and deaths on bank stock returns in MENA countries. In this investigation, we examined a combined impact of COVID-19 investor sentiments with COVID-19 cases and fatalities on bank stock returns. Lastly, in this study, we investigated the difference between Islamic and conventional banks on stock market returns during the pandemic. Control variables included the World Uncertainty Index (WUI), the World Pandemic Uncertainty Index (WPUI), oil price, and a dummy variable for Islamic banks.

The results indicate that the change rate in the number of COVID-19 cases had a consistently negative impact on the bank stock returns. However, there was only a weak link between the COVID-19 death rate and bank stock returns. Moreover, the COVID-19 investor sentiment did not significantly influence bank stock returns. In addition, the interaction effect between investor sentiment with COVID-19 cases and deaths showed that investor sentiment strengthened the negative impacts on bank stock returns. Lastly, Islamic banks were found to outperform conventional banks in the MENA countries.

2. Literature Review

It has been argued that the development and availability of different types of news deliveries have a significant impact on the link between investor sentiment and market returns (Kaplanski and Levy 2010; Sun et al. 2021). It was documented that investor sentiment can cause stock mispricing due to mispricing of earnings (Cheema et al. 2020; Naseem et al. 2021). This is because media pessimism causes a lower market price (Naseem et al. 2021). Many studies have documented the strong impact of sentiment on asset pricing in multiple countries (Zhang et al. 2018; Seo and Kim 2015; Shen et al. 2019; Li et al. 2017). The sentiment link to asset markets depends on whether the sentiment is positive or negative. Sun et al. (2021) studied the impact of investor sentiment on the stock returns of Chinese companies. They found a strong, consistent positive link between investor sentiment and stock returns in various industries. Their findings indicated that investor sentiment had a more predictive power than other proxies of sentiments during the COVID-19 pandemic (Xu and Zhou 2018). On the other hand, Kling and Gao (2008) found that investor sentiment did not predict stock returns in the Chinese stock market. Most related studies found a link between investor sentiment and asset prices, reflecting how investors process the news and react by adjusting their trading positions.

The spread of COVID-19 has recently motivated researchers to examine the impact of COVID-19 cases and deaths on asset prices. The results generally found that the link was negative across countries. For example, Harjoto et al. (2021) studied the impact of COVID-19 cases and deaths on stock market returns and volatility across 76 countries. They found that both COVID-19 cases and deaths negatively impacted stock market returns. A similar study on the Chinese stock market discovered a negative link between COVID-19 cases and fatalities on the stock returns of listed companies (Ashraf 2020b; Zaremba et al. 2020; Al-Awadhi et al. 2020). Salisu and Vo (2020), looking at the 20 countries worst hit by COVID-19, as their sample, studied the impact of COVID-19 cases and deaths on stock returns and found a similar negative impact.

It was indicated that the expectation of spikes in COVID-19 cases or deaths would create uncertainties. These uncertainties usually damage domestic and global economies (Salisu and Akanni 2020). In previous work, researchers indicated that uncertainty was one of the important factors influencing investment decisions (Vickman et al. 2012; Zhu et al. 2021). Therefore, uncertainty needs to be incorporated in the decision making process. Several recent studies have investigated the impact of uncertainty concerning stock market returns and volatilities (Coskun et al. 2020). Bakas and Triantafyllou (2020), Chiah and Zhong (2020), Albulescu (2021), Hemrit and Benlagha (2021), and Zhu et al. (2021) studied the link between the World Pandemic Uncertainty Index (WPUI) and different stock market indices and found a negative link. On the other hand, Wang et al. (2021) examined the association between uncertainty and S&P 500 returns and found that the uncertainty related to the COVID-19 pandemic was positively linked to the stock return index. However, other studies have highlighted a varying, but consistent, link between different types of uncertainty and commodity prices, such as oil, gas, and coal prices (Bouoiyour et al. 2019; Assaf et al. 2021; Huang et al. 2021).

Oil prices can influence stock market returns in three ways. First is through expected cash flow, where a change in oil price changes a stock's expected cash flow, influencing its return (Ciner 2013; Kilian 2009). The second is through inflation, where an increase in oil price can cause the costs of production and borrowing to increase, influencing the valuation discount rate (Ciner 2013; Assaf et al. 2021). Lastly, oil price fluctuation can impact stock returns through uncertainty. Higher oil demand can lead to positive expectations and, therefore, increase stock returns, while the link is negative if the impact is from the supply side (Filis et al. 2011; Assaf et al. 2021). There are two strands in the existing literature related to the link between oil prices and asset prices. For example, Alamgir and Amin (2021) and Prabheesh et al. (2021) studied the impact of oil prices on the stock markets in different Asian countries and found a positive link between oil prices and stock markets. Albaity and Mustafa (2018) found that oil prices consistently increased stock market returns in the Gulf Cooperation Council (GCC) region. On the other hand, other studies have found that the oil price could cause negative stock returns (Cong et al. 2008; Sharma et al. 2018; Bani and Ramli 2019). In contrast, other studies have found no statistically significant link between oil price and stock returns (Ciner 2013; Lee et al. 2012).

The banking system worldwide was (and still is) affected by the COVID-19 pandemic. Islamic banks potentially face more exposure since their transactions have to be linked to the real economy, contrary to conventional banks. Islamic banks might be more exposed to the COVID-19 pandemic than other banks (Mansour et al. 2021; Chattha and Alhabshi 2020). Islamic banks, whose primary activities are debt-based operate closely with real-economy sectors and therefore are sensitive to hidden risks during the COVID-19 (Mansour et al. 2021). This is because Islamic bank transactions are based on goods and services compared to conventional banks (Chattha and Alhabshi 2020). In other words, Islamic bank transactions are based on buying and selling and partnership contracts. Given that banks globally had to postpone installment payments, the real market came to an "almost" standstill. The profitability of Islamic banks would have been hit harder than conventional banks (IFSB 2020). Moreover, Islamic banks might suffer lower liquidity due to the postponement of financing repayments (Mansour et al. 2021). On the other hand,

Islamic banks were predicted to be resilient due to their connections to the real economy since Islamic banks do not face the same asset–liability mismatches that conventional banks face, especially in times of crises (Hasan and Dridi 2011; Beck et al. 2013; Farooq and Zaheer 2015; Assaf et al. 2019). Bourkhis and Nabi (2013) studied whether there was a difference between Islamic and conventional banks during the global financial crisis. They found no difference between these banks regarding liquidity and non-performing loans. Similarly, Doumpos et al. (2017) studied the difference between Islamic banks and their counterparts in MENA countries using the financial strength index. They found no significant difference between these banks.

3. Data and Methodology

In this paper, we investigated the impact of the change rate of COVID-19 investor sentiment, cases, and deaths on the bank stock return in, primarily, MENA countries. In addition, we controlled for the sway of the uncertainty via two indices, namely the World Uncertainty Index (WUI) and the World Pandemic Uncertainty Index (WPUI), as well as oil return and the type of bank (Islamic vs. conventional). Secondly, the study sheds light on the interaction effects between COVID-19 sentiment with cases/deaths on the bank stock returns. Lastly, we investigated the disparity between Islamic and conventional banks. Monthly data concerning listed banks were collected for 19 countries in the MENA region from January 2020 to July 2021. A dataset of individual stock closing prices was obtained from the BankFocus database to calculate the monthly returns. Banks with no bank stock return data for 10 consecutive months were excluded from refining the data, eliminating Algeria, Libya, and Yemen. Thus, the final sample covered 16 countries and included a total of 137 banks. Data concerning COVID-19 investor sentiment was collected and calculated from Google Trends.

In contrast, the data on COVID-19 cases and deaths were obtained from the European Centre for Disease Prevention and Control. The World Uncertainty Index website provided the World Pandemic Uncertainty Index and the World Uncertainty Index data. Lastly, the oil return data were obtained from the Refinitiv database.

To examine the impacts of change in the COVID-19 investor sentiment index (the lagged sentiment), cases (lagged cases), and deaths (lagged deaths) on bank stock returns in MENA countries, we considered the following panel regression model:

$$R_{i,j,t} = \alpha_0 + \alpha_1 \Delta CS_{j,t} + \alpha_2 \Delta CV_{j,t} + \alpha_3 WPUI_{j,t} + \alpha_4 WUI_{j,t} + \alpha_5 IS_{j,t} + \alpha_6 Oil_t + \gamma + u_{i,j,t} \tag{1}$$

$$R_{i,j,t} = \alpha_0 + \alpha_1 \Delta CS_{j,t-1} + \alpha_2 \Delta CV_{j,t-1} + \alpha_3 WPUI_{j,t} + \alpha_4 WUI_{j,t} + \alpha_5 IS_{j,t} + \alpha_6 Oil_t + \gamma + u_{i,j,t} \tag{2}$$

where $R_{i,j,t}$ is the rate of return of the stock price for each bank i is country j during month t. Previous studies have documented that bank stock returns are affected by micro and macro variables (Al-Awadhi et al. 2020; Demir and Danisman 2021; Ashraf 2020b). Thus, $\Delta CS_{j,t}$ ($\Delta CS_{j,t-1}$) was included in the model specification to reflect changes in the COVID-19 investor market sentiment (or its lagged value), which refers to the level of uncertainty of investors regarding the virus. $\Delta CV_{j,t}$ ($\Delta CV_{j,t-1}$) is the change of either the number of cases (lagged cases), which is the number of confirmed COVID-19 cases (ΔCC_t; ΔCC_{t-1} in the results table below) or the number of deaths (or its lagged value) (ΔCD_t; ΔCD_{t-1} in the results table below). We used either cases or death due to the high correlation between these two variable (close to 0.8). $WPUI_{j,t}$ and $WUI_{j,t}$ denote the World Pandemic Uncertainty Index Discussion and the World Uncertainty Index by country, $IS_{j,t}$ is a dummy variable that takes the value of 1 for Islamic banks, and 0 otherwise, Oil_t is the growth rate of the oil price. γ is the dummy variable included to capture the year fixed-effect and $u_{j,t}$ is the disturbance term.

The COVID-19 investor sentiment refers to the level of uncertainty of investors regarding the virus. The COVID-19 sentiment was collected monthly from Google Trends for the period January 2020 to July 2021. Eleven terms were used and produced monthly observations for each country in the sample. The first difference was used to create the change

in COVID-19 sentiment. In addition, COVID-19 cases and deaths were the cumulative numbers of cases and deaths monthly. The number of cases and deaths was transformed using the first difference to avoid spurious analysis. For uncertainty, the first proxy used was the World Pandemic Uncertainty index, which is the aggregate index of pandemic discussions by country. The Economist Intelligence Unit (EIU) shows the percentage of pandemic-related words in each country. A higher value indicates a higher pandemic-related discussion. We used the discussion of the pandemic rather than the pandemic uncertainty due to data unavailability. The second proxy was the World Uncertainty Index, representing the aggregate index of the uncertainty by country. It counted the number of times the word "uncertain" or its variant appeared in the EIU reports. A higher value indicates a higher level of uncertainty. In addition, MENA countries have a dual banking system that relies on Islamic and conventional banks for the tested sample. Thus, the Islamic bank dummy was introduced to test whether Islamic banks were affected more than conventional banks in this region. As the MENA region contains 65% of the world's oil reserve, the oil price growth rate was included, and it was computed as the monthly growth rate of the world oil prices in US dollars (USD). Oil price growth was added to control the impact of changes in the economy. In this study, we also examined the interaction effect between the main variables to gauge the dependence of the link between changes in COVID-19 cases/deaths and bank stock returns on the change of investor sentiment. Schell et al. (2020) found that the impact of the COVID-19 crisis worsened after sentiment about the pandemic became widely known, suggesting that sentiment amplified the impact of the pandemic. Liu et al. (2021) used the interaction between sentiment and the rate of COVID-19 cases and deaths on the risk of Chinese stock market crashes and found a significant impact. Specifically, they found that fear strengthened the negative impact of COVID-19 cases/deaths on a stock market crash risk. Therefore, it was hypothesized that there was a statistically significant interaction effect on bank stock returns. Based on the above discussion, the following models were developed:

$$R_{i,j,t} = \alpha_0 + \alpha_1 \Delta CS_{j,t} + \alpha_2 \Delta CV_{j,t} + \alpha_3 WPUI_{j,t} + \alpha_4 WUI_{j,t} + \alpha_5 IS_{j,t} + \alpha_6 Oil_t + \alpha_7 \Delta CS_{j,t} * \Delta CV_{j,t} + \gamma + u_{i,j,t} \tag{3}$$

$$R_{i,j,t} = \alpha_0 + \alpha_1 \Delta CS_{j,t-1} + \alpha_2 \Delta CV_{j,t-1} + \alpha_3 WPUI_{j,t} + \alpha_4 WUI_{j,t} + \alpha_5 IS_{j,t} + \alpha_6 Oil_t + \alpha_7 \Delta CS_{j,t} * \Delta CV_{j,t} + \gamma + u_{i,j,t} \tag{4}$$

where the variables are as previously defined and $\Delta CS_{j,t} * \Delta CV_{j,t}$ $(\Delta CS_{j,t-1} * \Delta CV_{j,t-1})$ are the interactions between the change of COVID-19 investor sentiment (lagged sentiment) and the change of the cumulative number of cases (lagged cases), which is the number of confirmed COVID-19 cases or the cumulative number of deaths (lagged deaths).

However, the interaction effect between changes in COVID-19 cases/deaths and COVID-19 investor sentiment could be more pertinent through their lagged values on bank returns. Thus, the impact of the lagged variables was retested in a third specification, as follows:

$$R_{i,j,t} = \alpha_0 + \alpha_1 \Delta CS_{j,t} + \alpha_2 \Delta CS_{j,t-1} + \alpha_3 \Delta CV_{j,t} + \alpha_4 \Delta CV_{j,t-1} + \alpha_3 WPUI_{j,t} + \alpha_4 WUI_{j,t} + \alpha_5 IS_{j,t} + \alpha_6 Oil_t + \gamma + u_{i,j,t} \tag{5}$$

where the variables are as previously defined and $\Delta CS_{j,t-1}$ and $\Delta CV_{j,t-1}$ are the lag of COVID-19 investor sentiment and the change in the number of COVID-19 cases, which is the number of confirmed COVID-19 cases, or the number of deaths. The three models above were tested using a panel data clustered standard error fixed effect (CSEFE) estimation since there were multiple banks in multiple countries across time. In addition, the panel data (CSEFE) estimation was employed to obtain control of the time-varying link between bank stock returns and all independent variables; Huynh et al. (2021). Moreover, panel data (CSEFE) estimation minimized heteroscedasticity and multi-collinearity (Huynh et al. 2021; Wooldridge 2010).

4. Results and Analysis

Table 1 shows the descriptive results of the variables by country. The first, second, and third rows show the means, the standard deviations, and the coefficient of variation (CoV), respectively. The descriptive statistics shows that the means of bank stock returns were positive for the majority of MENA countries, except for; the UAE, Jordan, Morocco, Palestine, and Tunisia. The highest mean belonged to Iran (0.06), while the lowest belonged to Palestine (−0.05), suggesting that, on average, most banks in MENA countries managed to achieve positive returns. The change of COVID-19 sentiment was positive, except for Israel, Egypt, and Iran, where the growth rates were negative. This result indicated that most sampled countries had positive sentiments about COVID-19, reflecting a higher awareness level regarding the pandemic's spread. In contrast, the change in the number of cases of COVID-19 was the highest for Iran and the lowest was in Syria. Similarly, the change in the number of COVID-19 deaths was the highest in Iran and the lowest was in Qatar. The WPUI and WUI were positive for all countries, and the WPUI and WUI were the highest in Iran and Tunisia, respectively. The standard deviations of all the variables showed variability across all countries. For the coefficient of variation, the standard deviation was relatively too large compared to the mean of bank stock returns in Bahrain and Egypt, with a very small means approaching zero as reported and, hence, CoV was not derived. This was followed by the United Arab Emirates. For the change in ΔCS, Lebanon distinctly had the highest CoV compared to its peers. The CoV of the ΔCC, WPUI, and WUI were very close for all countries, while it was clearly high for Bahrain in terms of ΔCD.

Table 1. Descriptive statistics of the study variables.

Country	Statistics	R	ΔCS	ΔCC	ΔCD	WPUI	WUI
United Arab Emirates	Mean	−0.01	19	40,208	116	242	0.18
	SD	(0.13)	(659)	(26,732)	(93)	(71)	(0.11)
	CoV	13.00	34.68	0.66	0.80	0.29	0.61
Bahrain	Mean	0.00	11	15,839	28	0	0
	SD	(0.12)	(428)	(16,159)	(750)	(0)	(0)
	CoV		38.91	1.02	26.79		
Egypt	Mean	0.00	−2	16,724	972	241	0.17
	SD	(0.10)	(347)	(13,059)	(638)	(140)	(0.10)
	CoV		173.50	0.78	0.66	0.58	0.59
Israel	Mean	0.01	−3	51,606	381	184	0.19
	SD	(0.08)	(477)	(57,143)	(383)	(124)	(0.07)
	CoV	8	159	1.11	1.01	0.67	0.37
Iraq	Mean	0.02	7	98,076	1122	215	0.22
	SD	(0.19)	(184)	(73,604)	(826)	(141)	(0.08)
	CoV	9.50	26.29	0.75	0.74	0.66	0.36
Iran	Mean	0.06	−12	229,093	5373	232	0.37
	SD	(0.29)	(359)	(184,792)	(3381)	(67)	(0.13)
	CoV	4.83	29.92	0.81	0.63	0.29	0.35
Jordan	Mean	−0.05	12	48,083	626	298	0.01
	SD	(0.24)	(258)	(65,274)	(786)	(141)	(0.02)
	CoV	4.80	21.50	1.36	1.26	0.47	2.00
Kuwait	Mean	0.01	26	23,441	97	261	0.15
	SD	(0.10)	(392)	(13,552)	(594)	(143)	(0.06)
	CoV	10.00	15.08	0.58	6.12	0.55	0.40
Lebanon	Mean	0.02	1	32,080	462	164	0.23
	SD	(0.19)	(251)	(36,452)	(600)	(111)	(0.10)
	CoV	9.50	251.00	1.14	1.30	0.68	0.43
Morocco	Mean	−0.01	11	33,663	601	271	0.19
	SD	(0.07)	(393)	(38,995)	(665)	(116)	(0.19)
	CoV	7	35.73	1.16	1.11	0.43	1

Table 1. *Cont.*

Country	Statistics	R	ΔCS	ΔCC	ΔCD	WPUI	WUI
Oman	Mean	0.01	10	17,477	228	258	0.09
	SD	(0.11)	(464)	(14,101)	(224)	(97)	(0.14)
	CoV	11.00	46.40	0.81	0.98	0.38	1.56
Palestine	Mean	−0.05	14	21,600	242	0	0
	SD	(0.24)	(194)	(20,571)	(235)	(0)	(0)
	CoV	4.80	13.86	0.95	0.97		
Qatar	Mean	0.01	18	13,326	23	308	0.15
	SD	(0.06)	(535)	(11,948)	(166)	(127)	(0.09)
	CoV	6.00	29.72	0.90	7.22	0.41	0.60
Saudi Arabia	Mean	0.02	23	30,989	485	255	0.15
	SD	(0.09)	(513)	(29,904)	(383)	(95)	(0.07)
	CoV	4.50	22.30	0.96	0.79	0.37	0.47
Syria	Mean	0.00	0	1528	113	0	0
	SD	(0.18)	(134)	(1247)	(100)	(0)	(0)
	CoV			0.82	0.88		
Tunisia	Mean	−0.02	27	35,104	1190	311	0.36
	SD	(0.07)	(303)	(38,551)	(1253)	(120)	(0.17)
	CoV	3.50	11.22	1.10	1.05	0.39	0.47
Total	Mean	0.00	12	41,611	668	258	0.18
	SD	(0.15)	(421)	(72,640)	(1509)	(123)	(0.14)
	CoV		35.08	1.75	2.26	0.48	0.78

First, second, and third rows show the mean, standard deviation (SD) (in parenthesis), and the coefficient of variation (CoV), R is the bank stock return, ΔCS is the change of COVID-19 investor sentiment, ΔCC the change in the number of COVID-19 cases, ΔCD the change in the number of COVID-19 deaths, WPUI is the world pandemic index discussion, and WUI is the World Uncertainty Index.

Table 2 presents the results of different specifications of Equations (1)–(4) related to the change in the number of COVID-19 cases (or lagged values). The results showed that the change of COVID-19 sentiment was not significant across the specifications. However, the change in the number of cases had negative and significant impacts on bank stock returns in all specifications. The WPUI discussion appeared to have positive and significant impacts on bank stock returns in MENA countries, while the WUI did not show any significant link to bank stock returns. In addition, the dummy variable for Islamic banks showed very strong and significant impacts on bank stock returns in all specifications, suggesting that Islamic banks performed better than conventional banks in MENA countries. The results also indicated that the growth rate in oil prices consistently negatively impacted bank stock returns. Since the impact of the change in COVID-19 sentiment and the number of cases could be delayed in impacting bank stock returns, the impact of a one-month lag was investigated on bank stock returns. The results of the lagged change of COVID-19 sentiment showed a positive and significant impact on bank stock returns. This outcome indicated that the impact of sentiment was delayed, leading to higher returns when such information was internalized. The lagged change of COVID-19 cases was negative and significant in only two out of six models, supporting the initial contemporaneous results. Lastly, an interaction term was included to examine whether the impact of the change on bank stock returns depended on COVID-19 sentiment.

Table 3 presents the results of the same model specifications, but for Equations (1)–(4), where the changes in the number of deaths (or lagged values) are included. The change of COVID-19 sentiment was not significant across all specifications, similar to the earlier results. The changes in the number of deaths appeared to be weakly significant in only two out of the six models. This outcome suggested that the number of COVID-19 cases was the leading factor affecting bank stock returns rather than the COVID-19 deaths. The WPUI discussion was positive and significant across the models, while the WUI was insignificant.

Table 2. Fixed effect results of the relationships among bank returns, COVID-19 rate of investor sentiment, cases, and their interactions.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ΔCS	0.081	0.112	0.131				−0.036	0.121	0.131			
	(0.158)	(0.107)	(0.109)				(0.177)	(0.127)	(0.129)			
ΔCC	−0.002 ***	−0.001 **	−0.001 **				−0.002 ***	−0.001 **	−0.001 **			
	(0.001)	(0.000)	(0.000)				(0.001)	(0.000)	(0.000)			
WPUI	0.03129 ***	0.02116 ***	0.02149 ***	0.02863 ***	0.02094 ***	0.02141 ***	0.03175 ***	0.02112 ***	0.02149 ***	0.02882 ***	0.02107 ***	0.02155 ***
	(0.00734)	(0.00550)	(0.00539)	(0.00822)	(0.00586)	(0.00571)	(0.00730)	(0.00548)	(0.00536)	(0.00822)	(0.00587)	(0.00572)
WUI	1.97958	−1.70709	−1.49745	−2.28813	−3.39048	−3.28465	0.71147	−1.61405	−1.49313	−1.67963	−2.99954	−2.85680
	(4.72019)	(2.84399)	(2.83306)	(4.98215)	(3.07928)	(3.06436)	(4.65330)	(2.90356)	(2.89784)	(4.81024)	(3.03139)	(3.02139)
IS		0.96456 ***	0.96417 ***		0.98927 ***	0.98906 ***		0.96487 ***	0.96418 ***		0.98795***	0.98761 ***
		(0.01934)	(0.01942)		(0.02628)	(0.02616)		(0.01944)	(0.01959)		(0.02690)	(0.02684)
Oil			−14.73851 ***			−14.24793 ***			−14.73824 ***			−14.31411 ***
			(0.12403)			(0.11865)			(0.11480)			(0.11690)
ΔCS $_{t-1}$				0.807 ***	0.781 ***	0.762 ***				0.942 ***	0.868 ***	0.00857 ***
				(0.254)	(0.179)	(0.179)				(0.295)	(0.199)	(0.00199)
ΔCC$_{t-1}$				−0.002 *	0.000	0.000				−0.001 *	0.000	0.00000
				(0. 001)	(0.000)	(0.000)				(0.001)	(0.000)	(0.00000)
ΔCS × ΔCC							0.004 ***	−0.003	−0.002			
							(0.002)	(0.001)	(0.001)			
ΔCS $_{t-1}$ × ΔCC $_{t-1}$										−0.006	−0.004 **	−0.004 **
										(0.005)	(0.002)	(0.002)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1880	1880	1880	1768	1768	1768	1880	1880	1880	1768	1768	1768
R-squared	0.11	0.49	0.51	0.08	0.49	0.51	0.11	0.49	0.51	0.08	0.49	0.51
Number of ID	112	112	112	112	112	112	112	112	112	112	112	112

R is the bank stock return, ΔCS is the change of COVID-19 investor sentiment, ΔCC the change in the number of COVID-19 cases, WPUI is the world pandemic index discussion, WUI is the World Uncertainty Index, IS is a dummy variable for Islamic banks, Oil is the growth rate of oil prices, ΔCS$_{t-1}$ is the one month lag of the change of COVID-19 investor sentiment, ΔCC$_{t-1}$ is one month lag of the change in the number of COVID-19 cases, ΔCS × ΔCC is the interaction term of change of investor sentiment and number of cases and ΔCS $_{t-1}$ × ΔCC $_{t-1}$ is the interaction term of one month lag of change of investor sentiment and number cases. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Table 3. Fixed effect results of the relationships among bank returns, COVID-19 rate of investor sentiment, deaths, and their interactions.

Variables	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)
ΔCS	0.071 (0.156)	0.113 (0.108)	0.132 (0.110)				−0.031 (0.151)	0.111 (0.113)	0.132 (0.116)			
ΔCD	−0.036 (0.047)	−0.020 (0.013)	−0.023 * (0.012)				−0.057 (0.044)	−0.020 (0.013)	−0.023 * (0.012)			
WPUI	0.03195 *** (0.00758)	0.02131 *** (0.00551)	0.02164 *** (0.00540)	0.02918 *** (0.00836)	0.02097 *** (0.00593)	0.02144 *** (0.00578)	0.03241 *** (0.00742)	0.02132 *** (0.00549)	0.02164 *** (0.00538)	0.02911 *** (0.00801)	0.02115 *** (0.00599)	0.02163 *** (0.00583)
WUI	0.32599 (4.41435)	−2.13961 (2.72977)	−1.91621 (2.71810)	−3.27920 (4.76378)	−3.29422 (2.90492)	−3.18848 (2.89549)	−1.33518 (4.46174)	−2.17243 (2.72535)	−1.91818 (2.71665)	−3.33821 (4.45990)	−3.14725 (2.91202)	−3.03606 (2.90278)
IS		0.96660 *** (0.01953)	0.96617 *** (0.01962)		0.98898 *** (0.02621)	0.98873 *** (0.02609)		0.96629 *** (0.01943)	0.96615 *** (0.01955)		0.98919 *** (0.02634)	0.98894 *** (0.02622)
Oil			−14.75878 *** (0.12711)			−14.24766 *** (0.11852)			−14.75868 *** (0.12996)			−14.24920 *** (0.11881)
ΔCS_{t-1}				0.813 *** (0.254)	0.781 *** (0.179)	0.762 *** (0.179)				0.810 *** (0.264)	0.789 *** (0.181)	0.770 *** (0.181)
ΔCD_{t-1}				−0.101 ** (0.039)	0.003 (0.018)	0.003 (0.017)				−0.102 ** (0.041)	0.005 (0.018)	0.004 (0.017)
$\Delta CS \times \Delta CD$							0.003 *** (0.000)	0.005 (0.030)	0.000 (0.003)			
$\Delta CS_{t-1} \times \Delta CD_{t-1}$										0.001 (0.020)	−0.003 (0.003)	−0.003 (0.003)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1880	1880	1880	1768	1768	1768	1880	1880	1880	1768	1768	1768
R-squared	0.11	0.49	0.51	0.08	0.49	0.51	0.11	0.49	0.51	0.08	0.49	0.51
Number of ID	112	112	112	112	112	112	112	112	112	112	112	112

R is the bank stock return, ΔCS is the change of COVID-19 investor sentiment, ΔCD the change in the number of COVID-19 deaths, WPUI is the world pandemic index discussion, WUI is the World Uncertainty Index, IS is a dummy variable for Islamic banks, Oil is the growth rate of oil prices, ΔCS_{t-1} is the one month lag of the change of COVID-19 investor sentiment, ΔCD_{t-1} is one month lag of the change in the number of COVID-19 deaths, $\Delta CS \times \Delta CD$ is the interaction term of change of investor sentiment and number of deaths and $\Delta CS_{t-1} \times \Delta CD_{t-1}$ is the interaction term of one month lag of change of investor sentiment and number deaths. Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$, * $p < 0.1$.

Similar to the earlier results, Islamic banks outperformed conventional banks in MENA countries. The growth rate of oil prices was negative and significant, indicating that the higher the growth rate, the lower the bank stock returns. As reported earlier, the lagged change of COVID-19 investor sentiment was positive and significant. In contrast, the lagged change of COVID-19 deaths was weakly significant and negative in two out of the six specifications. The interaction term was only positive and significant in one case where current COVID-19 sentiment appeared to weaken the impact of the change in the number of COVID-19 deaths on bank stock returns.

Table 4 presents the results of the combined models of the contemporaneous and lagged independent variables (Equation (5)). The results showed that for COVID-19 sentiment, the current and the lagged variables were positive and significant across all models, supporting the earlier results and indicating the previous month's sentiment and the current month's sentiment influencing bank returns in MENA region countries. On the other hand, the same was not true for the change in the number of COVID-19 cases, where only the current month influenced the bank returns. The WPUI discussion showed a consistently positive impact, while the WUI had no link to bank stock returns. The current month's change of COVID-19 deaths negatively impacted bank returns in two of the specifications, while the lagged rate was significant once. This outcome enforced the earlier results that cases better-predicted bank stock returns. Similar to earlier results, Islamic banks outperformed conventional banks, and the growth rate of oil prices consistently impacted bank stock returns.

Table 4. Fixed effect results of the relationships between bank returns, COVID-19 rate of investor sentiment, deaths, and their lags.

Variables	(1)	(2)	(3)	(4)	(5)	(6)
ΔCS	0.540 **	0.512 **	0.357 **	0.362 **	0.392 ***	0.398 ***
	(0.224)	(0.223)	(0.146)	(0.147)	(0.144)	(0.146)
ΔCS_{t-1}	0.819 ***	0.811 ***	0.793 ***	0.790 ***	0.774 ***	0.772 ***
	(0.253)	(0.253)	(0.178)	(0.179)	(0.178)	(0.179)
ΔCC	−0.001 **		−0.001 ***		−0.001 ***	
	(0.00000)		(0.00000)		(0.00000)	
ΔCC_{t-1}	−0.00001		0.00001		0.00001	
	(0.00001)		(0.00000)		(0.00000)	
WPUI	0.02807 ***	0.02901 ***	0.02047 ***	0.02069 ***	0.02094 ***	0.02114 ***
	(0.00824)	(0.00845)	(0.00585)	(0.00594)	(0.00571)	(0.00580)
WUI	−0.69089	−2.39769	−2.13856	−2.46686	−1.97893	−2.27943
	(4.98783)	(4.71530)	(3.11185)	(2.90114)	(3.10749)	(2.90037)
ΔCD		−0.006		−0.037 ***		−0.040 ***
		(0.043)		(0.012)		(0.013)
ΔCD_{t-1}		−0.090 **		0.024		0.026
		(0.036)		(0.019)		(0.019)
IS			0.98619 ***	0.98744 ***	0.98568 ***	0.98701 ***
			(0.02757)	(0.02739)	(0.02755)	(0.02736)
Oil					−14.41437 ***	−14.44758 ***
					(0.12615)	(0.13013)
Year Effect	Yes	Yes	Yes	Yes	Yes	Yes
Observations	1768	1768	1768	1768	1768	1768
R-squared	0.088	0.088	0.49	0.49	0.51	0.51
Number of ID	112	112	112	112	112	112

R is the bank stock return, ΔCS is the change of COVID-19 investor sentiment, ΔCC (ΔCD) the change in the number of COVID-19 cases (deaths), WPUI is the world pandemic index discussion, WUI is the World Uncertainty Index, IS is a dummy variable for Islamic banks, Oil is the growth rate of oil prices, ΔCS_{t-1} is the one month lag of the change of COVID-19 investor sentiment, ΔCC_{t-1} (ΔCD_{t-1}) is one month lag of the change in the number of COVID-19 cases (deaths). Robust standard errors in parentheses. *** $p < 0.01$, ** $p < 0.05$.

5. Discussion and Conclusions

This study investigated the impacts of the changes of COVID-19 cases and deaths on bank stock returns in MENA countries. In addition, this study investigated whether the impact of the infection rates and deaths on bank stock returns depended on the change of COVID-19 sentiment. The results suggested that current and lagged changes of COVID-19 sentiment positively influenced bank stock returns in MENA countries. This result is similar to what was reported by Liu et al. (2020), who found that COVID-19 sentiment positively influenced the returns of several sectors in the US market. This outcome was explained by investor overreaction, where news influenced investors' behavior to overbuy or oversell stocks during unexpected events (Burns et al. 2012; Lu et al. 2012; Sun et al. 2021).

We believe that, while the COVID-19 pandemic was unexpected, investors reacted to negative information rationally, yielding a positive link between investor sentiment and bank stock returns. Regarding the impact of the change on the number of cases, we found that the current and lagged number of cases negatively impacted bank stock returns. This result is in line with many other studies investigating the link between COVID-19 cases and stock returns (Ashraf 2020b; Salisu and Vo 2020; Al-Awadhi et al. 2020). It was unsurprising that the number of COVID-19 cases led to lower bank stock returns. Social media constantly emphasized the dangers of the virus and the bleak outlook brought forward by quarantines and lockdowns as the number of cases spiked.

Contrary to previous findings, the impact of the change of COVID-19 deaths had a weak negative link to bank stock returns in MENA countries. This outcome was the opposite of multiple studies on various economies using different methodologies (Ashraf 2020a; Salisu and Vo 2020; Al-Awadhi et al. 2020; Harjoto et al. 2021). We believe that the weak link was due to the general perception that COVID-19 cases reflected deaths. Therefore, when the number of cases was released, the public perceived it as bad news and reacted to it rather than the number of deaths, so the actual death numbers had a negligible impact. The WPUI discussion was positive and significant across all specifications, indicating that a higher level of discussions about the pandemic led to better bank stock returns. This result was contrary to previous research linking the WPUI or other uncertainty indices to asset returns, where the link was negative (Bakas and Triantafyllou 2020; Bilgin et al. 2018; Qin et al. 2020). It is believed that this result was due to the following. The impact of the WPUI discussion prepared the market for the coming shock. Therefore, the market already received the information once the event arrived, and the reaction was normalized.

The dummy variable for Islamic banks was consistently positive and significant, pointing to their better performance than conventional banks in terms of returns. This outcome can be explained by the fact that Islamic banks are governed by sharia law, which regulates their business transactions. For example, Islamic banks are not allowed to give loans; instead, they must engage in transactions involving the buying and selling of goods and services, making it extremely difficult to inflate one side of the balance sheet. Therefore, when the pandemic hit both conventional and Islamic banks, Islamic banks reduced the asset and liability sides of their balance sheets simultaneously. In contrast, conventional banks would not do the same (Mirzaei et al. 2020). In addition, the COVID-19 pandemic has had a severe impact on the derivatives market, which conventional banks rely upon heavily. Oil price was other control variable (and it is crucial in MENA countries). The growth rate of the oil price was negative and significant across all specifications suggesting that a higher growth rate led to lower returns during the COVID-19 pandemic. This situation is because higher oil prices increase the inflation rate leading to an increase in the cost of production, which eventually might lead to lower stock returns (Driesprong et al. 2008; Hemrit and Benlagha 2021). Lastly, the interaction terms, in the change of COVID-19 investor sentiment with the change of cases, appeared positive in the current month, negative in the one-month lag, while for the deaths, it was positive and significant in the current month. This outcome indicates the following: in the current month, the change of COVID-19 investor sentiment enforces the negative impact of the change in COVID-19 cases on bank stock returns. The lagged one-month change of COVID-19 investor sentiment weakens the impact of the

change in COVID-19 cases on bank stock returns in MENA countries. The results suggest that the impact of the change in COVID-19 cases on bank stock returns depended on COVID-19 investor sentiment. in other words, in one case, the current COVID-19 investor sentiment strengthened the negative link between the change in COVID-19 cases and bank stock returns, while in the other cases, it weakened that negative link. In summary, in the current month, the investor sentiment strengthens the impact of the number of cases and death on stock returns. However, the one-month lagged investor sentiment weakens the effect of the number of cases on stock returns. This proves that, once the news is released, markets react to it and incorporate all necessary information, so that within one month, most of that information is utilized by investors.

An increase in cases is considered to be a signal of a negative market movement; therefore, the findings emphasize this factor's predictive power to market shocks. As a result, keeping track of investments is crucial to prevent major losses when investing in this challenging time. Investors can take advantage of the differences between Islamic and conventional banks in MENA countries to diversify their portfolios, by moving from Islamic to conventional banks and vice versa. To minimize the negative effects of COVID-19 cases and deaths on stock markets and the economy, policymakers must ensure transparency and economic policies. Furthermore, the results allow policymakers and market analysts to recognize and understand how investor sentiment results differ in MENA countries. The positive link can help investors predict the outcome of the stock market to their benefit.

The findings of this study have the following implications: first, the results imply that, since COVID-19 cases are important in predicting bank returns, investors should pay close attention to news related to COVID-19 cases, as well as monitor the pandemic and its developments before investing. This situation also implies that investing in conventional bank stocks might not be suitable for this pandemic. Second, if investors are willing to take the risk, Islamic bank stocks might be the most suitable options. Oil prices should be monitored carefully, and policymakers should monitor inflation due to fluctuations in oil prices.

In future studies, researchers might be interested in comparing regions to see if the impacts of the same variables are similar. In addition, the use of higher-frequency data might yield more significant results. Moreover, new methods might appear to measure pandemic uncertainty, which could be used in place of pandemic discussion uncertainty and add to the existing studies (essentially expanding the body of knowledge). In MENA or GCC, the moderating effects of oil price fluctuations could be investigated.

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