COVID-19 Cases, Deaths, Vaccinations and Malaysian Islamic Stock Market Returns

Lain-Tze Tee, Si-Roei Kew

Faculty of Economics and Management, Universiti Kebangsaan Malaysia
(The National University of Malaysia), Malaysia.

Corresponding author email: jrtee@ukm.edu.my

Abstract - **Coronavirus (COVID-19) has been the greatest disrupting pandemic that results in economy and social devastations. This study aims to explore the impact of novel COVID-19 pandemic on Islamic stock market returns in Malaysia. We find that COVID-19 new cases exert negative and significant effect on Islamic stock market returns. In addition, COVID-19 deaths significantly and adversely influence Islamic stock market returns. Particularly, the findings reveal that higher levels of COVID-19 new cases and deaths tend to reduce Islamic stock returns in Malaysia. Interestingly, we document that vaccinations have no impact in influencing Islamic stock market returns, signifying that vaccinations are not effective in improving Islamic stock market returns in Malaysia over the sample period. Our findings provide important implications for academics, policymakers and investors to comprehend the effect of COVID-19 on Islamic stock returns. The results suggest that Islamic stock investments in Malaysia do not show as a superior investment option during the health crisis.**

Keywords - *Coronavirus (COVID-19) Cases, Deaths, Islamic Indices, Stock Returns, Vaccinations*

I. Introduction

The outbreak of COVID-19 pandemic has not only taken a drastic human toll, but has reverberating impact on global economy (World Bank, 2020). This health crisis results in the asset prices of equity markets have fallen sharply. The prices have suffered about half of the declines they experienced during the global financial crisis (International Monetary Fund, 2020).

Most recent studies found that conventional stock markets are significantly impacted by the spread of COVID-19 (Al-Awadhi, AlSaifi, Al-Awadhi, & Alhamadi, 2020, Baker et al., 2020, Hasan, Mahi, Hassan, & Bhuiyan, 2021, Khalfaoui, Nammouri, Labidi, & Jabeur, 2021, Yilmazkuday, 2021, among others). However,

the study on whether COVID-19 influences the returns of Islamic stock market in Malaysia remains unexplored although Malaysia is renowned as a vibrant Islamic finance market.

Tee, Kew and Low (2019) describe that performance differences between Islamic and conventional stocks can be explained by the principles that govern Islamic stocks. Islamic stock investments are prevalent among market participants, particularly Muslim investors. They tend to invest in stocks that are compliant with Islamic laws. Islamic laws forbid investing in companies with incomes from betting activities, entertainment, conventional financial services, non-halal products such as tobacco, pork, liquor and other business operations which are not compliant with Islamic laws. In addition, companies have to meet certain criteria for their financial ratios as Islamic investment does not allow sinful interest incomes and unbearable amount of debts in the companies. For non-Muslim investors who are interested in ethical investments, they are attracted to invest in Islamic stocks thanks to the ethical elements embedded in Islamic equities. Due to the differences in conventional and Islamic stock investment characteristics, the outbreak of COVID-19 may cause different effects on the Islamic stock market performance.

Therefore, this paper contributes to emerging literature on the relationship between health crisis and stock market returns in several ways. First, this study investigates whether COVID-19 pandemic, measured by new positive cases, deaths, and vaccinations affect the Islamic stock market returns. Second, most of the current studies focus only on conventional stock markets. To the best of our knowledge, this is the first study empirically explores the effect of COVID-19 pandemic on Islamic stock market returns from the prospective of Malaysia. The World Health Organization (WHO) declared the outbreak of COVID-19 in China in January 2020. Southeast Asia which includes Malaysia was one of the first regions impacted by the outburst of COVID-19 on account of close geographical factor and business associations with China (OECD, 2020). Therefore, it is expected that the COVID-19 pandemic has effect on Malaysian Islamic financial market returns. The findings are imperative for financial market participants who consider investing Islamic stocks.

The remainder of the article is organized as follows. Section 2 reviews the literature. Section 3 presents the data and methodology. Section 4 reports the empirical results and Section 5 concludes the study.

II. Literature Review

Recent studies have documented evidence that the outbreak of COVID-19 pandemic have significantly negative impact on conventional stock markets. Baker et al. (2020) point out that the COVID-19 pandemic has caused the highest volatility of the United States (U.S.) stock market among all other previous infectious disease outbreaks such as Bird Flu (H5N1), SARS, Swine Flu (H1N1), as well as Ebola and MERS in history.

Yilmazkuday (2021) investigates the effect of COVID-19 cases on the U.S. stock market. The author observes that U.S. stock market returns decline as the number of COVID-19 cases increase. Furthermore, studying the effect of COVID-19 on emerging stock markets, Topcu and Gulai (2020) find that the COVID-19 has the greatest negative impact on emerging stock markets in Asia, whereas the smallest impact in European emerging markets. Similarly, Al-Awadhi et al. (2020) reveal that the total confirmed COVID-19 cases and the total cases of death resulted by COVID-19 significantly and negatively affect stock returns in the China stock market. Particularly, increases in COVID-19 cases and deaths result in reductions on the Chinese stock market returns. Erdem (2020) also finds that global stock market performance is adversely affected by the number of COVID-19 pandemic cases.

However, contrary to the earlier findings, Scherf, Matschke, and Rieger (2021) show that the number of new COVID-19 cases does not significantly influence stock market returns in selected OECD and BRICS countries. This finding is surprising since the COVID-19 cases prompted the relaxation or restrictions of government policy response on economy activities.

A recent study has done by Hasan et al. (2021) to evaluate the effect of COVID-19 pandemic on Islamic and conventional stock markets from a global perspective. The results show that both Islamic and conventional stock markets display more volatility since the outbreak of COVID-19 pandemic. The findings also imply that both markets are strongly correlated and move together. This suggests that Islamic stock investments do not present a greater investment alternative in the period of economic turmoil.

Furthermore, Shear and Ashraf (2022) analyse the performance of Islamic and conventional stocks listed in Pakistan during the COVID-19 shock. They find that the prices of Islamic stocks exhibit smaller negative reaction to the growth of COVID-19 cases than the prices of conventional stocks. Therefore, Islamic stocks are more resilient to the crisis. Similarly, Bhutto, Khan, Khan, and Matlani, (2022) examine the effect of COVID-19 on Islamic and conventional stocks in the context of Pakistan. They find that COVID-19 exerts negative impact on both Islamic and conventional stocks. However, the magnitude of impact is lower for Islamic stocks than conventional stocks. In addition, the study of Salisu & Shaik (2022) also document that although the hedging effectiveness of Islamic decrease during COVID-19 pandemic, the Islamic stocks still perform better compared to the conventional stocks.

Recent study also investigates the impact of COVID-19 vaccine on the stock market performance. Khalfaoui et al. (2021) examine whether the COVID-19 vaccine is effective on the U.S. stock market. The findings show strong and positive impact of COVID-19 vaccination on the U.S. stock market returns. The findings thus suggest that the implementation of the vaccination program does not only improve the health crisis but also benefit the stock market by increasing investor confidence.

Generally, previous studies explore how the COVID-19 affects stock markets worldwide. Nevertheless, to the best of our knowledge, there is no study examining the effects of COVID-19 new cases, deaths and vaccinations on the Islamic stock market returns in Malaysia. This study fills the gap.

III. Data and Methodology

Daily data on prices of Morgan Stanley Capital International (MSCI) Malaysian Islamic stock market index, Coronavirus (COVID-19) new cases, deaths, vaccinations, crude oil prices, exchange rates, and prices of MSCI world Islamic stock market were retrieved from Datastream. All data were obtained for the period from January 2020 to August 2021.

Islamic stock market returns are measured by the continuously compounded rates of return on MSCI Malaysian stock index. They are calculated as log $(p_t/p_{t-1})*100$, where p is the day's closing price. Motivating from the studies of Al-Awadhi et al. (2020) and Topcu and Gulai (2020), the regression specification is written as follows:

$$RETURN_t = \beta_0 + \beta_1 COVID\text{-}19_t + \beta_2 OIL_t + \beta_3 EXR_t + \beta_4 WORLD_t + \varepsilon_t$$
(1)
$$t = 1,...,T$$

where subscript t refers to time period; ε_t is the error term. RETURN is returns on the MSCI Islamic Index of Malaysian stock market. COVID-19 is measured by CASE, DEATH and VACCI. CASE is daily growth in COVID-19 new cases, DEATH is daily growth in COVID-19 deaths, and VACCI is daily growth in total people fully vaccinated. Following Topcu and Gulai (2020), we include for crude oil price and exchange rate changes as the control variables. OIL is the changes in Brent crude oil price per barrel in U.S. dollar. EXR is the changes of Malaysian Ringgit to U.S. dollar. WORLD is the U.S. dollar returns of the MSCI world Islamic stock market. The details of variable used are presented in Appendix 1. This study eliminates potential biases in the estimated standard errors by estimating the heteroscedasticity and autocorrelation robust standard errors.

IV. Findings and Discussion

Table 1 reports descriptive statistics for variables used in this study. The returns on the Malaysian Islamic stock market (RETURN) has a mean value of -0.00039, signifying that the Islamic stock market on average experiences negative returns during the outbreak of COVID-19 pandemic. This result is consistent with the findings of Tee and Kew (2019) and Tee et al. (2019) that returns on Islamic stock returns are market-state dependent. The highest return of Malaysian Islamic stock market is 0.06061 whereas the lowest return is -0.05825. On average, the daily growth in COVID-19 new cases (CASE) is 0.24440 while the daily growth in COVID-19 deaths (DEATH) is 0.03035. The vaccinations (VACCI) observe an average value of 0.22597, implying that daily growth of 0.22597 in total people who are fully vaccinated in Malaysia. The changes of crude oil price (OIL) and exchange rate (EXR) are averaged at about 0.00041 and 0.00009. The returns on the MSCI world Islamic stock market have an average value of 0.00064.

Table 2 presents the correlation coefficients. The results confirm that multicollinearity among variables do not exist in this study. There exist negative correlations between Malaysian Islamic stock market returns and COVID-19 new cases and deaths. These suggest that COVID-19 new cases and deaths possibly assert negative effect on the Islamic stock market returns. On the other hand, COVID-19 vaccinations have positive correlation with Islamic stock market returns. The control variables such as exchange rates have negative correlations with Islamic stock market returns whereas crude oil price changes and world Islamic stock returns exhibit positive correlations with Islamic stock market returns.

Table 1: Descriptive Statistics

Variable	Mean	Standard Deviation	Minimum	Maximum
RETURN	-0.00039	0.01347	-0.05825	0.06061
CASE	0.24440	1.52668	-1.00000	20.00000

DEATH	0.03035	0.19476	0.00000	3.66667
VACCI	0.22597	0.91212	0.00000	7.14414
OIL	0.00041	0.04100	-0.44157	0.21511
EXR	0.00009	0.00285	-0.01147	0.01143
WORLD	0.00064	0.01405	-0.10155	0.08260

Notes: RETURN is returns on Malaysian Islamic stock market; CASE is daily growth in COVID-19 new cases; DEATH is daily growth in COVID-19 deaths; VACCI is daily growth in total people fully vaccinated; OIL is the changes in Brent Crude Oil price per barrel in U.S. dollar; EXR is the changes of Malaysian Ringgit to U.S. dollar; and WORLD is the U.S. dollar returns of the MSCI world Islamic stock market.

Table 2: Pearson Correlation Coefficients

	RETURN	CASE	DEATH	VACCI	OIL	EXR	WORLD
RETURN	1.0000						
CASE	-0.0143	1.0000					
DEATH	-0.1209**	-0.0004	1.0000				
VACCI	0.0328	-0.059	-0.1649*	1.0000			
OIL	0.1700***	-0.0665	-0.0369	-0.2196**	1.0000		
EXR	-0.4594***	-0.0848*	0.1918***	-0.0618	-0.2060***	1.0000	
WORLD	0.1855***	-0.0966*	-0.0994*	-0.0987	0.4148***	-0.2790***	1.0000

Notes: RETURN is returns on Malaysian Islamic stock market; CASE is daily growth in COVID-19 new cases; DEATH is daily growth in COVID-19 deaths; VACCI is daily growth in total people fully vaccinated; OIL is the changes in Brent Crude Oil price per barrel in U.S. dollar; EXR is the changes of Malaysian Ringgit to U.S. dollar; and WORLD is the U.S. dollar returns of the MSCI world Islamic stock market. ***, ** and * indicate statistical significance at the 1, 5 and 10% levels respectively.

Table 3 reports results for the effect of daily growth in COVID-19 new cases (CASE) on the Malaysian Islamic stock market returns. The coefficient of CASE is shown negatively related to Islamic stock market returns and significantly at the 5% level. This suggests that COVID-19 new cases reduce the returns on the Islamic stock market. This result is consistent with prior findings Al-Awadhi et al. (2020) and Yilmazkuday (2021) who document evidence on the bearish trend in stock returns due to the outbreak of COVID-19 pandemic. The findings also support the results of Hasan et al. (2021) that Islamic stock investing fails to generate profits during financial turmoil.

The crude oil price changes and world Islamic stock market returns appear significant and positive. The coefficient of the exchange rate is significantly negatively correlated with Islamic stock market returns. This implies that the depreciation of local exchange rate decreases stock market returns. This finding is consistent with the results of Topcu and Gulai (2020) and Yusuf et al. (2020).

Table 4 presents the results of the relation between growth in COVID-19 deaths (DEATH) and Malaysian Islamic stock market returns. The coefficient of the DEATH is negative and significant at the 1% level. This suggests that high level of COVID-19 deaths tend to decrease Islamic stock market returns. This result supports the findings of Al-Awadhi et al. (2020) that total cases of death caused by COVID-19 significantly and negatively influence stock returns. The world Islamic stock market returns remain significantly and positively influence Islamic stock market returns. On the contrary, exchange rates have statistically negative impact on Islamic stock market returns.

Table 3: The Regression Estimates of COVID-19 New Cases on Islamic Stock Market Returns

Variable	Coefficients	
CASE	-0.00013	(-2.0182)**
OIL	0.02033	(4.3989)***
EXR	-2.02190	(-22.1950)***
WORLD	0.02841	(4.1443)***

Constant	**0.00018**	**(1.0063)**
Adjusted R-squared	**0.1945**	
F-statistics	**24.2323**	
Probability(F-statistic)	**0.0000**	

Notes: This table presents the estimates from regression. CASE is daily growth in COVID-19 new cases; OIL is the changes in Brent Crude Oil price per barrel in U.S. dollar; EXR is the changes of Malaysian Ringgit to U.S. dollar; and WORLD is the U.S. dollar returns of the MSCI world Islamic stock market. The standard errors adjusted for heteroscedasticity and autocorrelation. The *t*-statistics are presented in parentheses. ***, ** and * indicate statistical significance at the 1, 5 and 10% levels respectively.

Table 4: The Regression Estimates of COVID-19 Deaths on Islamic Stock Market Returns

Variable	Coefficients	
DEATH	-0.00296	(-3.5141)***
OIL	0.01549	(1.2693)
EXR	-1.78216	(-7.4757)***
WORLD	0.04713	(3.0979)***
Constant	0.00007	(0.1904)
Adjusted R-squared	0.1527	
F-statistics	17.5365	
Probability(*F*-statistic)	0.0000	

Notes: This table presents the estimates from regression. DEATH is daily growth in COVID-19 deaths; OIL is the changes in Brent Crude Oil price per barrel in U.S. dollar; EXR is the changes of Malaysian Ringgit to U.S. dollar; and WORLD is the U.S. dollar returns of the MSCI world Islamic stock market. The standard errors adjusted for heteroscedasticity and autocorrelation. The *t*-statistics are presented in parentheses. ***, ** and * indicate statistical significance at the 1, 5 and 10% levels respectively.

Table 5 presents the results for the impacts of growth in COVID-19 vaccinations (VACCI) on the Malaysian Islamic stock market returns. It is shown that the growth in total people fully vaccinated is not significant in explaining the stock market returns. Thus, we find no evidence that vaccination influences the Malaysian Islamic stock market returns. This finding is inconsistent with Khalfaoui et al. (2021) who find that COVID-19 vaccination shows positive and significant impact on the U.S. stock returns. This suggests that the findings for the U.S. stock market cannot be generalised to emerging country like Malaysia. The crude oil price changes are positively related to Islamic stock market returns. The exchange rate, on the other hand, is negatively linked to Islamic stock market returns.

Table 5: The regression estimates of COVID-19 vaccinations on Islamic stock market returns

Variable	Coefficients	
VACCI	-0.00012	(-0.5072)
OIL	0.05983	(2.3235)**
EXR	-1.10086	(-2.9375)***
WORLD	-0.03780	(-0.2543)
Constant	-0.00033	(-0.5566)

Adjusted R-squared	0.0945
F-statistics	4.0964
Probability(*F*-statistic)	0.0000

Notes: This table presents the estimates from regression. VACCI is daily growth in total people fully vaccinated; OIL is the changes in Brent Crude Oil price per barrel in U.S. dollar; EXR is the changes of Malaysian Ringgit to U.S. dollar; and WORLD is the U.S. dollar returns of the MSCI world Islamic stock market. The standard errors adjusted for heteroscedasticity and autocorrelation. The *t*-statistics are presented in parentheses. ***, ** and * indicate statistical significance at the 1, 5 and 10% levels respectively.

V.   Conclusions

This study aims to investigate whether COVID-19 pandemic importantly influences the Islamic stock market return in Malaysia. Specifically, we explore the impact of COVID-19 new cases, deaths and vaccinations on Islamic stock market returns for the sample period from January 2020 to August 2021. The findings suggest that COVID-19 new cases negatively affect the Malaysian Islamic stock market returns. Particularly, the growth in the number of new cases tends to reduce Islamic stock returns. In addition, we find that COVID-19 deaths have statistically adverse impact on Islamic stock market returns.

On the relation between COVID-19 vaccinations and stock market returns, we however find no evidence that the growth in total people fully vaccinated influences the Islamic stock market returns. The findings also show that crude oil price changes, world Islamic stock market returns, and exchange rate changes are important in affecting Islamic stock market returns.

Overall, the findings of this study shed some lights on the effect of widespread COVID-19 pandemic in influencing Islamic stock market returns in Malaysia. The findings offer implications for academics, policymakers and investors. The paper fills the gap in the current literature regarding the impact of health crisis on stock market returns in the context of Malaysian Islamic stock market. The results suggest that Islamic stock market performance has been severely affected by the COVID-19 pandemic. The policymakers must take an active role in designing and implementing effective policies to address the adverse effects of health crisis on stock market performance. They are urged to execute rapid policy intervention and take precautionary measures against the health crisis in order to deter Malaysian Islamic stock market from further deteriorating and entering into another worsen financial crisis. Furthermore, the findings do not suggest that Malaysian Islamic stock investments present a superior investment profit opportunities during financial turmoil. Therefore, investors and portfolio managers are suggested to find other investment alternatives during health crisis.

The limitation of this study is this research focus mainly on one country. It would be meaningful to explore the influence of COVID-19 pandemic on Islamic stock market returns at the worldwide level by including more countries in the study.

Appendix 1

Variable	Description
RETURN	Returns on MSCI Malaysian Islamic stock market index
CASE	Daily growth in COVID-19 new cases
DEATH	Daily growth in COVID-19 deaths
VACCI	Daily growth in COVID-19 vaccinations, total of people fully vaccinated
OIL	The changes in Brent crude oil price per barrel in U.S. dollar.
EXR	The changes of each country's exchange value to one U.S. dollar
WORLD	The U.S. dollar returns of the MSCI world Islamic stock market

References

Al-Awadhi, A.M., AlSaifi, K., Al-Awadhi, A., & Alhamadi, S. (2020). Death and contagious infectious diseases: Impact of the COVID-19 virus on stock market returns. *Journal of Behavioral and Experimental Finance, 27*, 100326. https://doi.org/10.1016/j.jbef.2020.100326.

Baker, S.R., Bloom N., Davis S.J., Kost K., Sammon M., & Viratyosin T. (2020). The unprecedented stock market reaction to COVID-19. *The Review of Asset Pricing Studies,10*(4), 742–758. https://doi.org/10.1093/rapstu/raaa008

Bhutto, N.A., Khan, S., Khan, U.A., & Matlani, A. (2022). The impact of COVID-19 on conventional and Islamic stocks: Empirical evidence from Pakistan. *Journal of Economic & Administrative Sciences.* https://doi.org/10.1108/JEAS-09-2021-0180

Erdem, O. (2020). Freedom and stock market performance during Covid-19 outbreak. *Finance Research Letters, 36*, 101671. https://doi.org/10.1016/j.frl.2020.101671.

Hasan, M.B., Mahi, M., Hassan, M.K., & Bhuiyan, A.B. (2021). Impact of COVID-19 pandemic on stock markets: Conventional vs. Islamic indices using wavelet-based multi-timescales analysis. *The North American Journal of Economics and Finance, 58*, 1–11. https://doi.org/10.1016/j.najef.2021.101504.

International Monetary Fund. (2020). Global financial stability report: Markets in the time of COVID-19. 1–28

Khalfaoui, R., Nammouri, H., Labidi, O., & Jabeur S.B. (2021). Is the COVID-19 vaccine effective on the US financial market? *Public Health, 198*, 177–179. https://doi.org/10.1016/j.puhe.2021.07.026

OECD (2020). COVID-19 crisis response in ASEAN member states.

Salisu, A.A. & Shaik, M. (2022). Islamic stock indices and COVID-19 pandemic. *International Review of Economics and Finance, 80*, 282–293. https://doi.org/10.1016/j.iref.2022.02.073

Scherf, M., Matschke, X., & Rieger, M.O. (2021). Stock market reactions to COVID-19 lockdown: A global analysis. *Finance Research Letters,* 102245. https://doi.org/10.1016/j.frl.2021.102245.

Shear, F., & Ashraf, B.N. (2022). The performance of Islamic versus conventional stocks during the COVID-19 shock: Evidence from firm-level data. *Research in International Business and Finance, 60*, 101622. https://doi.org/10.1016/j.ribaf.2022.101622.

Tee, L.-T., & Kew, S.-R. (2019). Risk, business cycles and financial crises: Evidence from Islamic and conventional stocks. *Jurnal Pengurusan, 56*, 39–46. https://doi.org/10.17576/pengurusan-2019-56-04

Tee, L.-T., Kew, S.-R., & Low, S.-W. (2019). Do momentum strategies perform better for Islamic stocks than for conventional stocks across market states? *Economic Annals, 64*(221), 107–129. https://doi.org/10.2298/EKA1921107T

Topcu, M., & Gulai, O.S. (2020). The impact of COVID-19 on emerging stock markets. *Finance Research Letters,* 101691. https://doi.org/10.1016/j.frl.2020.101691.

Worlbank (2020). Saving lives, scaling-up impact and getting back on track. World Bank Group COVID-19 Crisis Response Approach Paper, 1–51.

Yilmazkuday, H. (2021). COVID-19 effects on the S&P 500 index. *Applied Economics Letters*, 1–7. DOI: 10.1080/13504851.2021.1971607

Yusuf, N.H.M., Hilmi, N.A.M., Abdoh, W.M.Y.M., Zain, R.S., & Shah, N.S.B. (2020). Determinants of macroeconomic variables on Islamic stock index: Evidence from frontier market. Journal of International Business, Economics & Entrepreneurship, 5(1), 23–29.