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Do Islamic Stocks Outperform Conventional Stocks During Crisis Periods? A Global Comparison

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ABSTRACT

Purpose: This study examines the performance of Islamic and Conventional stock indices during the Covid-19 pandemic crises. The aim of the study is to find the existence of safe havens in Islamic stock indices.

Design/methodology/approach: The study uses mean and cumulative return values and the GARCH (1 1) model to examine the volatility performance of stock returns and the impact of Covid-19 on both indices.

Findings: Our findings indicate that Islamic stock indices tend to outperform conventional indices during crisis periods, particularly in developing economies and in the short term. However, conventional stock indices exhibit stronger performance in the long run and post-crisis periods. Moreover, the study reveals that the effects of Covid-19 cases and deaths on both indices vary across countries. Additionally, Islamic stock returns demonstrate lower volatility compared to previous shocks and returns, whereas conventional indices experience higher volatility, particularly in developing countries. Therefore, the study establishes that Islamic indices can serve as safe havens for investors in certain countries, but not universally.

Research limitations/implications: The study can be extended and more effective by adding more crisis events and a number of years to examine long-term stock moments. The study can be helpful for investors in designing investment portfolios, especially in times of crisis where the majority of investors try to find safe havens for investment.

Originality/value: This study is the first to examine the impact of recent crises on Islamic and conventional stock indices in the world's big stock markets. The study is also the first one to use the longest data period among the recent studies to differentiate the performance of Islamic and conventional indices.

Keywords: Stock performance, Islamic Indices, Conventional indices, Covid-19 pandemic, Financial crises

I. Introduction

The significance of Islamic or Shariah-compliant financial products gained prominence during the global financial crisis of 2008-09, where they demonstrated distinct performance characteristics (Abedifar, Molyneux, and Tarazi, 2013). Since then, the Islamic finance industry has experienced remarkable growth, with global assets reaching \$3.374 trillion in 2020 and a projected growth trajectory expected to exceed \$4.94 trillion by 2025, as indicated by the Refinitiv findings of the 2021 Islamic Finance Development Indicator. Additionally, the industry saw robust double-digit year-on-year growth in 2019, reflecting its increasing global appeal. The United States, since 2010, has also been gradually fostering

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the presence of Islamic finance through federal and state regulatory initiatives.

The global financial crisis of 2007-09, stemming from the U.S. subprime crisis, had severe global repercussions. Major conventional financial institutions faced collapse or required massive government bailouts due to high debt levels and mortgage-based practices. During this crisis, Islamic finance emerged as an alternative investment option. Interest in alternative finance, especially Islamic Shariah-compliant instruments, has been steadily increasing. Empirical research has shown that Islamic stocks and some conventional commodities offer diversification benefits. However, researchers hold varying views, with some supporting decoupling theories and others endorsing contagion theories. This suggests a need for further research in this area (Assefa and Jackson 2010; Hammoudeh, Mensi, Reboredo, & Nguyen, 2014; Majdoub & Mansour, 2014).

A hallmark feature of Islamic finance is the Shariah screening process, which entails a meticulous evaluation of companies to ensure their compliance with halal (legitimate) or haram (unlawful) criteria (Derigs and Marzban, 2008). Prohibited activities include involvement in alcohol, gambling, and pork-related products. Furthermore, Islamic firms significantly restrict their reliance on debt, leading to the exclusion of highly leveraged companies from Shariah-compliant investments. This selective process inherently results in a more constrained pool of investable equities, potentially contributing to greater volatility in the returns of the remaining Shariah-compliant investments (Hussein and Omran, 2005).

Research into the performance of Islamic or Shariah-compliant stocks has yielded mixed results. Some studies have indicated that Islamic equities outperform their conventional counterparts, while others have found no significant performance differential. There are also studies suggesting that conventional stocks perform better under certain circumstances. For instance, Al-Khazali et al. (2014) and Ho et al. (2014) report mixed evidence, with Islamic stock indices outperforming conventional indices during crisis periods but not during non-crisis periods. Hayat and Kraeussl (2011) find weak evidence of profitability, while Ashraf and Mohammad (2014), Bialkowski et al. (2012), and Hoepner et al. (2011) have discovered relatively compelling evidence that Islamic stocks are profitable.

The onset of the COVID-19 pandemic in early 2020 had a profound impact on global financial markets, causing widespread turbulence. Stock markets worldwide experienced disruptions, with American stock markets triggering circuit breakers twice in a single week, and similar effects observed in other major countries. Several studies have concluded that the stock market turbulence resulting from the COVID-19 pandemic was as severe as, if not more severe than, the 2008 financial crisis. Starting in late February and early March 2020, financial markets entered a phase of risk aversion, leading to a sharp increase in volatility. Stock markets experienced rapid declines, losing approximately 30% of their market value within weeks, surpassing the speed of the decline witnessed during the 2008 global financial crisis. Although there was some recovery following the announcement of bailout programs, overall, stock markets responded negatively to the COVID-19 pandemic. Assessing the pandemic's impact on stock markets is vital for both investors and academia (Rahman et al., 2021).

Islamic stock markets have garnered interest from investors and practitioners due to their perception as "safe havens." Understanding the interplay between conventional and Islamic indexes is crucial for creating effective trading strategies and maximizing diversification benefits. The Islamic finance industry represents a novel business model and an alternative source of financing on a global scale. Recent years have witnessed significant growth in the Islamic financial industry, primarily driven by Shariahcompliant stock and Sukuk (Islamic bond) issuances. Investors have the option to choose between Islamic securities in global Islamic indexes or conventional securities. Investing in Islamic assets differs from conventional assets due to the distinct risk-return characteristics of Shariah-compliant stocks and Sukuk. Islamic law allows investment in securities as long as firms avoid prohibited activities, thereby encouraging ethical investment. Islamic fund managers focus on selecting Shariah-compliant stocks or businesses that adhere to ethical standards. This different approach to Islamic investment methodology can provide managers with more diverse portfolios compared to those focused on conventional companies.

Against this backdrop, this study seeks to examine the performance of Islamic and Conventional stock indices amid the COVID-19 crisis. The primary objective is to assess how these indices have performed during this challenging period by analyzing a sample of major stock indices from around the world. The study aims to revisit and scrutinize claims made by previous researchers who argued that Islamic indices outperformed conventional indices during the global financial crisis of 2008. Given that the current crisis is considered more severe and has significantly impacted various sectors of the economy, this investigation aims to evaluate stock performance in light of these recent circumstances. While previous studies often examined international indices such as S&P, Dow Jones, and FTSE, this study fills a gap by exploring country-wise indices.

This study contributes to the existing literature in several ways. Firstly, it provides an extended view of Islamic stock indices globally, going beyond the limited focus of earlier studies on specific indices. Secondly, it adds to the literature by examining how Islamic and conventional indices differ across different countries and regions, offering insights into regional variations. Thirdly, the study serves as a valuable source of guidance for investors seeking to manage risk during crises and normal periods while investing in various regions worldwide. The findings of this research will be relevant to both academia and practitioners in the field of Islamic finance and global investment, offering valuable insights into portfolio diversification strategies in a rapidly evolving financial landscape.

II. Literature Review

A. Islamic and Conventional Stocks Performance

Over the last two decades, Islamic assets have gained prominence in global capital markets as ethicallyfiltered investments rooted in Islamic principles. This growth has spurred significant research, especially since 2010, focusing on various aspects of Islamic and conventional finance. Much of this research revolves around risk-return analysis, performance during financial crises, spill-over effects, and contagion analysis.

Early research in Islamic finance explored its unique features, such as the prohibition of interest payments (Riba) and the use of financial ratios for numerical screening (Bashir, 1983; Karsten, 1982). Additionally, researchers compared the performance of Islamic stock indices with conventional counterparts in terms of risk and return, yet this comparison often yielded inconclusive results.

Studies conducted before and after the 2008 financial crisis offered diverse insights. For example, Ahmad and Ibrahim (2002) analyzed the performance of the Kuala Lumpur Stock Exchange's Shariah Index (SI) and Composite Index (CI) from 1999 to 2002, finding that while the KLSI had lower returns over the entire period, it slightly outperformed during growth periods. Hakim and Rashidian (2002) studied DJIMI's relationship with the Wilshire 5000 index and the risk-free rate from December 1999 to April 2002, concluding that the screening process for DJIMI stocks did not lead to losses for investors. Hussein (2004) compared the FTSE Global Islamic Index and the FTSE All-World Index using CAPM estimation, revealing that the Islamic index outperformed its conventional counterpart, especially during economic growth periods. However, Raphie and Roman (2011) examined 145 Islamic equity funds (IEFs) from 2000 to 2009, finding that IEFs generally underperformed both Islamic and conventional benchmarks, with underperformance becoming more apparent during the 2008 financial crisis.

Most studies conducted post-2008 have explored

the impact of crises and news events on the performance of conventional and Islamic (Shariah) stocks in various countries. Narayan and Bannigidadmath (2015) found that financial news predicted Islamic stock returns better than conventional ones, suggesting the potential profitability of investing in Islamic stocks. Milly and Sultan (2012) compared conventional, Islamic, and socially responsible stock portfolios from 2000 to 2009, concluding that Islamic stocks had significantly higher Sharpe ratios, indicating potential safety during economic and financial distress. Abdullah et al. (2007) analyzed 14 Islamic and 51 conventional funds, finding that both types slightly underperformed the Kuala Lumpur Composite Index (KLCI) during bear markets but exhibited variations during bull markets. Azad et al. (2018) and Ebrahim et al. (2016) argued that Islamic/Shariah stocks outperformed conventional ones during crises due to lower leverage and a stronger presence in less responsive markets.

Several studies, including those by Al-Zoubi and Maghyereh (2007), Ashraf and Mohammad (2014), and Shamsuddin (2014), reported that Islamic stock indices outperformed conventional benchmarks when considering risk-adjusted returns. However, Abbes (2012) and Girard and Hassan (2008) found no significant performance differences between Islamic and conventional equity markets. Ho, Rahman, Yusuf, and Zamzamin (2014) and Jawadi, Jawadi, and Louchichi (2014) suggested that Islamic equity indices outperformed conventional ones during the 2007-2009 financial crises due to lower volatility and beta of Islamic stocks and the conservative nature of Shariah-compliant investments. Finally, Al-Yahyaee et al. (2020) compared 22 Islamic and conventional Dow Jones stock market indices during the global financial crisis (GFC) and the European sovereign debt crisis (ESDC), revealing that Islamic equity returns dominated their conventional counterparts during these crises and the subsequent post-crisis periods, although conventional equity returns were higher in pre-crisis periods.

B. Covid-19 Pandemic and Stocks Performance

In recent years, studies have explored the impact of financial crises on stock markets and the interplay between local and global indices. Researchers such as Jithendranathan and Thadavillil (2008), Al-Yahyaee et al. (2020), Furceri and Mourougane (2012), Kim and Shamsuddin (2008), and Chen and Huang (2012) have contributed to our understanding of these dynamics. Financial crises, as underscored by Furceri and Mourougane (2012), can have lasting adverse effects on potential economic output. Market efficiency during crises, as noted by Kim and Shamsuddin (2008), often remains stable, although exceptions exist.

The COVID-19 pandemic, declared by the World Health Organization (WHO) as a global pandemic in March 2020 (Estrada et al., 2020), has had a profound impact. With over five hundred million infections and more than six million deaths reported by April 2022, the crisis has affected public health and triggered a severe global financial crisis. Policymakers have grappled with the challenge of balancing public health and economic stability, particularly in hard-hit sectors like food, fashion, travel, and technology. Countries worldwide, including China, Japan, South Korea, Spain, Italy, France, Russia, Brazil, India, and the United States, have imposed lockdowns and travel restrictions, resulting in crises for many industries.

The pandemic's shocks reverberated across sectors, including stock markets, production, supply chains, tourism, and households (Sami Abushammala, 2022). Stock markets witnessed significant declines, with the Dow Jones Index and the S&P 500 index falling by 35% in under two months, drawing comparisons to historical crises like the 1929 Great Crash and the 2008 Global Financial Crisis (Baker et al., 2020).

While research on the pandemic's economic, stock market, and trade consequences is ongoing, several studies have examined its initial impacts. A. Salman and Q. Ali (2021) found that GCC stock markets were less affected than global ones. Ryandono et al. (2021) noted that Shariah stock indices were more sensitive to bad news than conventional indices. Arif et al. (2021) discovered that Islamic stocks provided diversification benefits during the Global Financial Crisis (GFC) and acted as a safe-haven asset during the COVID-19 pandemic. Other research has highlighted safe-haven assets like gold and sovereign bonds (Kinateder et al., 2021) and the resilience of Islamic finance (Alam & Ansari, 2020). Sherif (2020) found that faith-based investments outperformed conventional ones during the pandemic. Alzyadat et al. (2021) explored the role of the government's stimulus package in mitigating pandemic impacts in the Saudi Arabian stock market.

Empirical studies have confirmed the negative impact of the COVID-19 pandemic on stock market indices (Cao et al., 2020; Alber, 2020; Ahmar & del Val, 2020). Khan et al. (2020) demonstrated a negative relationship between new COVID-19 cases and stock returns in sixteen countries. He et al. (2020a) found a short-term negative impact on stock markets in affected countries. Khanthavit (2020) highlighted the severity of the pandemic's impact, especially in Asian markets. Government stimulus packages have helped mitigate some of these negative effects, as observed by Alam et al. (2020) in the Indian stock market.

In summary, recent research has shed light on the profound impact of the COVID-19 pandemic on various aspects of the global economy, including stock markets. While we have seen some initial insights into these effects, further research is needed to comprehensively understand the pandemic's long-term consequences on economic and financial systems.

Some studies suggest that the response to the COVID-19 pandemic has varied over time and among countries. Gormsen and Koijen (2020) found that U.S. and European Union stock markets initially did not respond strongly to the virus outbreak in China but reacted significantly when it spread to other countries. Khan et al. (2020) noted that investors did not immediately react to media news of COVID-19 in the early stages of the pandemic. Sansa (2020) identified a positive and significant relationship between COVID-19-confirmed cases and major financial markets in the USA and China during a

specific period in 2020.

Based on the above analysis our hypothesis for this study will be;

H1: Islamic indices perform better than conventional ones in crisis periods.

This study will fill the gap in the literature by examining country-wise indices to examine the impact of pandemic shocks on both Islamic and conventional indices. And then we will separate indices based on developed and developing status to examine the impact of crises in different regions of the world. Previous studies investigated the Islamic and conventional stock indices defense for specific indices, and most studies were done during the 2008 global financial crises and the early Covid-19 crises which covered only short periods. This study will cover the long data period to examine the nature of indices in different countries during crisis periods.

The rest of the paper is arranged as follows; section 3 contains data and methodology, section 4 describes the detailed results, section 5 explains the robustness, section 6 concludes with remarks, and contribution of the study.

III. Data and Methodology

In our study, we meticulously gathered data from 30 countries, focusing on two key variables: major stock market indices and the number of COVID-19 infections. These countries were categorized into two groups, namely developed and developing economies. The data collection period extended from January 1st, 2020, to June 30th, 2021. This specific timeframe was chosen due to its encapsulation of the COVID-19 pandemic's peak impact and the subsequent recovery witnessed in numerous countries' stock markets.

Table 1 lists the number of countries with indices covered in this study.

To thoroughly analyze the data, we employed a multifaceted approach. Initially, we conducted ARCH

tests (Table 2) to detect any heteroskedasticity within the time series data. Once the presence of heteroskedasticity was established, we proceeded to implement GARCH modeling to assess how external shocks reverberated through the stock indices. Our formal analysis encompassed several critical aspects, including the generation of descriptive statistics, cumulative return analysis, which was conducted for different time periods, and the application of ARCH models to account for non-stationarity and heteroskedasticity within the data. To validate our findings and ascertain potential mean differences, we utilized the Mann-Whitney U test, also known as the Wilcoxon rank-sum test, on both conventional and Shariah indices displayed in Table 7 (Mann-Whitney U, 1945; Wilcoxon, 1947).

Country	Index Name (Conventional)	Islamic Index
Australia	Australian Securities Exchange 200 Index	FTSE-Australia Shariah Index
Canada	Toronto Stock Exchange 300 Composite Index	FTSE-Canada Shariah Index
France	Euronext Paris	FTSE-France Shariah Index
Germany	Frankfurt Stock Exchange-Deutscher Aktien-Index	FTSE-Germany Shariah Index
Hong Kong	Hong Kong Exchanges-Hang Seng Index	FTSE-Hong Kong Shariah Index
Italy	Borsa Italiana (Milano Indice di Borsa)	FTSE-Italy Shariah Index
Japan	Tokyo Stock Exchange (TSE) Nikkei Index	FTSE-Japan-100 Shariah Index
Korea	Korea Stock Exchange-Korean Composite Index	FTSE-Korea Shariah Index
Netherland	The Amsterdam Stock Exchange	FTSE-Netherlands Shariah Index
New Zealand	New Zealand Stock Market-S&P-50 Index	FTSE-New Zealand Shariah Index
Singapore	FTSE Straits Times Index-Singapore Exchange	FTSE-SGX Shariah 100 Index
Spain	Spanish Exchange 35 Index (Bolsa de Madrid)	FTSE-Spain Shariah Index
Sweden	Stockholm Stock Exchange 30 Index	FTSE-Sweden Shariah Index
UK	London Stock Exchange-100 Index	FTSE-UK Shariah Index
US Nasdaq	NASDAQ-100 Index	FTSE-USA Shariah Index
USsp500	S&P 500 Index	-
Brazil	São Paulo Stock Exchange 50 Index	FTSE-Brazil Shariah Index
China(se)	Shanghai SE Composite Index	FTSE-China Shariah Index
China (Sz)	Shenzhen SE Composite Index	-
India	Bombay Stock Exchange-S&P 100 Index	FTSE-India Shariah Index
Indonesia	Jakarta Stock Exchange Composite Index	Jakarta SE Islamic Index (IDX-JII)
Malaysia	FTSE Bursa 100 Index	FTSE-Bursa Malaysia EMAS Shariah Index
Mexico	Bolsa Mexicana de Valores (MEXBOL)	FTSE-Mexico Shariah Index
Pakistan	Pakistan Stock Exchange 100 Index	Pakistan Stock Exchange Meezan Index (KMI-30)
Qatar	Qatar Stock Exchange General Index	S&P/IFCI Qatar Index
Russia	Russia Composite Index (Russian: Индекс МосБиржи)	FTSE-Russia Shariah Index
Saudi Arabia	Tadawul All Share Index	S&P Saudi Arabia Shariah Index
South Africa	FTSE/Johannesburg Stock Exchange 40 Index	FTSE-JSE Shariah All Share Index
Taiwan	Taiwan Stock Exchange Weighted Index	FTSE-Taiwan Shariah Index
Thailand	Stock Exchange of Thailand-100 Index	FTSE-Thailand Shariah Index
Turkey	Borsa Istanbul Stock Exchange 100 Index	FTSE-Turkey Shariah Index
UAE	Dubai Financial Market General Index	Dubai Financial Market Islamic Index (DFMSI)

Table 1. Index list with country information for Developed Economies

What sets our study apart is its unique data period, spanning a year and a half, making it one of the most extensive and contemporaneous analyses in this field of research. For a comprehensive presentation of our findings, as well as detailed data and results, please refer to our tables.

The log stock market returns are calculated by

the following formula:

$$R_t = \log^* 100 \left(\frac{p_t}{p_{t-1}}\right)$$

 P_t is the index value on the current day while P_{t-1} is the value of the index on the previous day.

Table 2. ARCH-LM tests results for Developed Countries

Country	Conv	entional	Islamic		
Country	chi2	Prob>Chi2	chi2	Prob>Chi2	
Australia	15.635	0.000	5.244	0.022	
Canada	50.937	0.000	14.960	0.001	
France	27.908	0.000	35.999	0.000	
Germany	13.176	0.004	24.249	0.000	
Hong Kong	14.794	0.000	36.659	0.000	
Italy	3.876	0.049	3.170	0.075	
Japan	65.950	0.000	19.467	0.000	
Korea	108.468	0.000	107.602	0.000	
Netherland	24.390	0.000	22.625	0.000	
New Zealand	69.570	0.000	33.781	0.000	
Singapore	107.812	0.000	64.758	0.000	
Spain	7.329	0.026	16.479	0.000	
Sweden	15.467	0.002	18.950	0.000	
UK	22.150	0.000	27.661	0.000	
US Nasdaq	70.438	0.000	57.054	0.000	
US&P500	64.797	0.000			
Brazil	92.737	0.000	94.296	0.000	
China (SE)	2.752	0.097	7.566	0.006	
China (SZ)	10.838	0.013			
India	7.023	0.008	12.159	0.001	
Indonesia	32.107	0.000	43.007	0.000	
Malaysia	29.271	0.000	10.204	0.001	
Mexico	63.224	0.000	34.818	0.000	
Pakistan	36.012	0.000	21.515	0.000	
Qatar	709.00	0.000	2431.13	0.000	
Russia	24.230	0.000	7.631	0.006	
Saudi Arabia	145.274	0.000	138.291	0.000	
South Africa	7.713	0.005	16.020	0.000	
Taiwan	60.813	0.000	39.195	0.000	
Thailand	18.383	0.000	19.864	0.000	
Turkey	5.611	0.060	29.461	0.000	
UAE	74.936	0.000	81.706	0.000	

We also calculated cumulative stock return to assess the index performance periodically;

$$CR_t = \sum R_t$$

To determine the reaction of stock returns periodically we divide our 1.5 years into four quarters of the year 2020 and then six months of 2021. Also, we evaluated the indices based on cumulative returns to know how profitable both indices are. Because cumulative returns will give us a clear image if the returns were positive or negative in the previous periods.

To determine the volatility, the use of the ARCH group of models in financial literature has been very successful since its introduction. From the initial ARCH model developed by Engle (1982), the model has experienced improvements including GARCH, GARCH-in-mean, Quadratic GARCH, Threshold GARCH models, etc. (ARCH) models are specially designed to forecast conditional variances. The variances of the dependent variable are modeled as a function of previous values of the dependent variables. The GARCH (p, q) model, proposed by Engle (1982) and Bollerslev (1986), can be simplified as follows;

A. ARCH Model

The conditional variance process is given an autoregressive structure and the log returns are modeled as white noise multiplied by the volatility; the model is presented below;

$$X_{t} = e_{t}\sigma_{t}$$

$$\sigma_{t}^{2} = \alpha_{0} + \alpha_{1}X_{t-1}^{2} + \dots + \alpha_{p}X_{t-p}^{2}, \qquad (1)$$

GARCH (1 1) Model

$$\sigma_t^2 = \alpha_0 + \alpha_1 X_{t-1}^2 + \dots + \alpha_p X_{t-p}^2 + \dots \beta_1 \sigma_{t-1}^2 + \dots + \beta_p \sigma_{t-p}^2$$
(2)

Where σ_t^2 refers to the conditional variance. The variance equation is based on the constant terms α_0 and information on fluctuations in the previous period $\alpha_1 X_{t-1}^2$, which is measured by the lag of the error square and its coefficient α . The expected variance in the previous period σ_{t-1}^2 , and its coefficient is β . This means it will require knowledge of previous expectations of variance σ^2 .

This model, in particular, the simpler GARCH (1,1) model, has become widely used in financial time series modeling and is implemented in most statistics and econometric software packages. GARCH (1,1) models are favored over other stochastic volatility models by many economists due to their relatively simple implementation: since they are given by stochastic difference equations in discrete time, the likelihood function is easier to handle than continuous-time models, and since financial data is generally gathered at discrete intervals.

We will modify the GARCH model by putting in COVID-19 variables to study the relationship between Covid-19 infections and the reaction of stock indices. The new equation will come from equation (2) and will be like this;

$$\sigma_t^{2=} \alpha_0 + \alpha_1 X_{t-1}^2 + \dots + \alpha_p X_{t-p}^2 + \dots \beta_1 X_{t-p}^2 + \dots + \beta_p \sigma_{t-p}^2 + \text{NCS} + \text{NDT}$$
(3)

In our analysis, we incorporated two key variables: NCS, representing new daily COVID-19 cases, and NDT, representing daily COVID-19-related deaths in the respective country. Additionally, we occasionally utilized lagged values of NCS (-1) and NDT (-1) to assess the potential long-lasting impact of COVID-19.

To assess the impact of these variables on stock returns, we employed the GARCH (1, 1) model, which considers lagged periods in the regression (ARCH term) as well as moving averages. This allowed us to examine how both current and past daily COVID-19 cases and deaths influenced stock indices.

However, before delving into the ARCH and GARCH modeling framework, we needed to ensure that our data met the requirement of stationarity. Stationarity is a crucial property for time series data analysis. To evaluate stationarity, we conducted the Phillips-Perron (1988) and Augmented Dickey-Fuller tests (Said & Dickey 1984), although the detailed results are not included here due to the extensive volume of tables generated for each index.

IV. Empirical Results and Analysis

A. Descriptive and Cumulative Results

Tables 3A and 3B provide descriptive findings for both developed and developing economies. In Table 3A, when examining the mean values, we observe that Hong Kong, Italy, Korea, the Netherlands, New Zealand, Singapore, Spain, and the UK exhibit superior mean values for Islamic indices compared to their conventional counterparts. Conversely, in Table 3B, countries like Brazil, UAE, India, Malaysia, Mexico, Saudi Arabia, Taiwan, Thailand, and Turkey show better mean values for their Islamic indices, while other countries demonstrate stronger performance in conventional indices.

Further exploration of stock return shocks reveals that Italy and Turkey experienced the most substantial negative stock return shocks, exceeding -17% in a single day. Additionally, countries like Brazil, Italy, New Zealand, and Turkey had negative values below -15%. These statistics highlight that Islamic indices performed well in approximately half of the countries during the period heavily impacted by the COVID-19 pandemic. Notably, more than half of the developed countries and half of the developing economies exhibited superior results in Islamic indices compared to conventional indices.

Tables 4A and 4B offer a comprehensive overview of cumulative returns (CR) for both conventional and Islamic indices across various time periods, shedding light on the pace of stock market recovery following crisis shocks, particularly during the COVID-19 pandemic. Cumulative returns are instrumental in quickly assessing whether a stock or index's performance is positive or negative over a given time frame.

In Table 4A, which focuses on developed economies, we discern intriguing patterns. Countries such as France, Germany, Hong Kong, Korea, the Netherlands, New Zealand, Singapore, Spain, Sweden, and the UK exhibit superior cumulative returns in Islamic or Shariah indices during several periods. This trend is especially notable during the second quarter of 2020, a period marked by the widespread impact of COVID-19 across the globe. In some countries, this trend continues into the latter part of 2020, while in others, it transitions in the third or fourth quarter. Notably, in the United States, the S&P 500 outperforms FTSE Islamic and NASDAQ, although during the recovery phase, when returns become positive, FTSE Islamic surpasses NASDAQ in both mean values and cumulative returns.

Table 4B, which focuses on developing countries, reveals a somewhat different landscape. With a few exceptions such as Brazil, Qatar, Russia, Thailand, and Turkey, Islamic stocks tend to follow the previously mentioned trend. These exceptions aside, countries display better cumulative return values for Islamic indices, particularly during the second quarter of 2020. Taiwan, in particular, exhibits superior returns for Islamic indices beginning in the third quarter of 2020, while the performance of both indices in these countries becomes more mixed during subsequent periods. For the remaining nations, conventional indices tend to perform better.

An interesting observation is that countries like Australia, Canada, Germany, Hong Kong, Korea, Sweden, the UK, and the US-FTSE had their Islamic indices significantly impacted during the first quarter due to highly negative cumulative returns. However, these indices exhibited remarkable recoveries during the second and third quarters of 2020. A similar pattern emerges for Islamic indices in countries such as China, Indonesia, Pakistan, South Africa, Saudi Arabia, and Taiwan in the developing group. These results underscore that Islamic indices tend to recover swiftly after experiencing negative shocks, outpacing their conventional counterparts. _____

During the distressing initial six months of the COVID-19 pandemic, countries where Islamic indices outperformed conventional ones were in the majority.

This trend highlights that Islamic indices can serve as safe havens for investors during crisis periods, presenting arbitrage opportunities on stock exchanges

Variable		Conve	ntional		Islamic			
variable	Mean	Std. D	Min	Max	Mean	Std. D	Min	Max
Australia	0.06	1.898	-10.93	7.12	0.046	1.979	-10.51	7.07
Canada	0.077	2.022	-13.29	12.24	0.054	1.892	-12.47	11.65
France	0.052	1.807	-12.93	9.06	0.05	1.721	-13.7	9.64
Germany	0.072	1.857	-12.89	11.66	0.058	1.783	-13.14	9.22
Hong Kong	0.013	1.398	-5.59	5.09	0.056	1.366	-6.74	4.7
Italy	0.048	1.927	-17.54	9.6	0.068	1.866	-17.52	8.38
Japan	0.064	1.55	-8.94	8.06	0.052	1.297	-6.83	6.84
Korea	0.126	1.646	-7.67	9.15	0.15	2.115	-10.37	11.18
Netherland	0.074	1.608	-11.42	9.64	0.172	1.939	-10.19	9.64
New Zealand	0.047	1.491	-7.71	9.17	0.064	1.823	-7.89	11.58
Singapore	0.002	1.412	-7.99	6.71	0.088	1.259	-5.22	5.79
Spain	0.009	1.885	-14.7	8.48	0.031	1.814	-15.16	7.72
Sweden	0.102	1.865	-12.58	9.26	0.094	1.977	-13.38	10.2
UK	0.009	1.782	-12.61	11.03	0.014	2.008	-14.52	14.12
US Nasdaq	0.152	2.022	-12.19	10.07	0.099	1.876	-11.59	9.49
USsp500	0.09	1.842	-11.98	9.38				

Table 3. Descriptive statistics for Developing Countrie	s
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В

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Variable		Conve	ntional		Islamic			
variable	Mean	Std. D	Min	Max	Mean	Std. D	Min	Max
Brazil	0.021	3.182	-16.5	13.11	0.086	3.034	-17.07	15.84
China (Sz)	0.125	1.566	-9.51	4.64				
India	0.079	1.886	-14.02	9.37	0.112	1.8	-13.38	10.06
Indonesia	-0.036	2.209	-10.71	15.2	-0.055	2.213	-10.56	14.02
Malaysia	-0.005	1.221	-6.19	6.56	0.007	1.256	-6.21	5.53
Mexico	0.04	2.103	-9.49	7.02	0.126	2.402	-10.58	9.36
Pakistan	0.041	1.435	-6.8	5.45	0.045	1.691	-7.59	7.06
Qatar	0.007	1.084	-9.7	3.45	0.004	1.161	-12.93	4.34
Russia	0.04	2.093	-11.73	9.93	0.012	2.464	-15.72	10.47
South Africa	0.064	2.232	-11.67	10.19	0.062	2.458	-14.23	10.77
Saudi Arabia	0.081	1.261	-8.3	7.09	0.086	1.289	-8.25	6.93
Taiwan	0.137	1.431	-6.67	7.07	0.163	1.676	-7.82	7.15
Thailand	-0.021	1.922	-12.37	8.79	0.003	2.055	-13.1	12.13
Turkey	-0.034	2.225	-16.53	9.17	0.005	2.077	-17.41	7.45
UAE	0.016	1.533	-8.29	7.32	0.024	1.441	-7.88	8.01

that feature both Islamic and conventional options.

А											
Country	Jan-Ma	r 2020	April-Ju	ne 2020	July-Se	July-Sep 2020		Oct-Dec 2020		Jan-June 2021	
Country	CONV	ISL	CONV	ISL	CONV	ISL	CONV	ISL	CONV	ISL	
Australia	-36.97	-43.49	28.39	28.94	2.76	4.93	20.10	21.41	8.53	5.76	
Canada	-27.23	-33.65	19.66	25.21	6.05	5.55	12.69	7.81	17.74	15.37	
France	-30.25	-25.65	15.05	16.82	2.06	4.81	19.39	13.13	13.43	10.24	
Germany	-28.35	-29.64	25.13	25.21	8.45	11.55	12.75	8.66	9.39	6.04	
Hong Kong	-17.33	-23.85	4.16	11.81	-3.56	3.43	15.18	12.32	6.45	16.56	
Italy	-31.01	-23.43	16.13	15.71	2.97	1.39	21.17	23.43	9.13	8.90	
Japan	-17.92	-16.87	17.04	12.72	6.60	6.29	19.33	13.56	-1.62	3.09	
Korea	-18.13	-18.16	17.78	20.19	10.41	11.31	23.36	38.42	12.90	3.99	
Netherland	-22.76	-16.72	19.07	27.76	2.54	4.11	17.70	23.02	13.22	27.24	
New Zealand	-26.15	-20.29	24.49	25.00	5.36	3.59	19.48	23.80	-5.61	-8.14	
Singapore	-29.80	-19.19	7.22	14.88	-2.64	10.03	17.89	22.19	8.18	5.61	
Spain	-33.90	-23.72	9.75	13.36	-2.53	5.02	23.51	18.05	6.59	-0.88	
Sweden	-22.67	-26.01	19.29	21.90	14.10	14.98	11.79	13.02	15.53	11.22	
UK	-32.02	-34.19	9.67	11.68	-0.46	0.37	15.91	14.44	10.25	13.03	
US Nasdaq	-8.78	-21.04	27.45	22.31	12.60	12.05	12.75	12.83	13.25	11.15	
US-S&P500	-19.15		19.47		8.50		11.40		13.93		

Table 4. Cumulative returns for Developed Economies

В

Country	Jan-Ma	r 2020	April-Ju	ne 2020	July-Se	p 2020	Oct-De	c 2020	Jan-Jun	e 2021
Country	CONV	ISL	CONV	ISL	CONV	ISL	CONV	ISL	CONV	ISL
Brazil	-65.94	-46.86	26.80	23.95	-1.29	3.70	32.58	35.34	15.63	15.81
China(se)	-12.05	-15.92	8.65	10.46	12.33	9.08	11.87	16.08	4.98	3.56
China (Sz)	-5.30		17.72		13.48		12.47		7.74	
India	-36.74	-33.47	19.58	30.22	12.11	20.59	22.43	9.38	11.82	14.86
Indonesia	-48.74	-48.91	26.08	26.99	-6.20	-6.80	30.17	25.72	-14.20	-16.81
Malaysia	-24.13	-21.52	13.97	18.78	5.67	10.43	11.20	5.57	-8.50	-10.59
Mexico	-44.83	-42.11	14.16	24.78	3.91	15.54	27.71	32.30	14.10	16.84
Pakistan	-40.02	-44.47	16.20	20.27	17.82	17.79	11.47	13.60	9.86	9.50
Qatar	-23.60	-21.44	9.60	8.40	10.61	8.61	4.57	2.60	1.63	3.11
Russia	-38.85	-42.60	20.33	16.76	-2.38	-14.23	17.79	21.35	18.02	23.11
South Africa	-42.23	-53.03	25.71	31.89	3.98	6.50	22.09	23.36	14.23	14.33
Saudi Arabia	-23.73	-24.59	11.50	12.28	13.95	12.34	4.87	6.58	23.75	25.69
Taiwan	-21.49	-23.12	21.32	18.28	9.48	21.65	19.51	23.48	20.42	18.33
Thailand	-40.86	-35.39	24.19	22.79	-12.97	-12.82	21.42	30.02	0.52	-3.45
Turkey	-33.66	-27.55	23.34	21.92	-12.46	-6.08	30.79	26.04	-20.82	-12.59
UAE	-42.12	-36.96	16.45	16.17	9.09	7.09	9.48	11.72	12.50	10.35

B. GARCH (1 1) Results

Initially, the study assesses the presence of heteroskedasticity in stock market returns through the autoregressive conditional heteroskedasticity (ARCH) test. The results confirm significant volatility in the stock market returns, justifying the utilization of ARCH models. Subsequently, the study applies the GARCH (1, 1) model separately to both conventional and Islamic indices in all countries. The GARCH (1, 1) results consist of two components: the mean equation and the variance equation. The mean equation elucidates the impact of lagged return values from preceding days on current stock returns, while the variance equation examines the influence of regressors on volatility, with a primary focus on the variance equation.

The study proceeds to investigate the intensity of COVID-19 on conventional and Islamic stock indices using the GARCH (1, 1) model. This model is adapted to include the number of daily COVID-19 cases (NCS) and the number of deaths (NDT) as additional variables to gauge which index is more susceptible to COVID-19-related news shocks. Tables 5 and 6 present the GARCH (1, 1) results categorized into three groups. The outcomes reveal the significance of the majority of ARCH and GARCH terms, signifying the presence of autocorrelation in the data and its non-stationary nature. Additionally, the significance of the GARCH (1, 1) term in many countries underscores the enduring impact of previous returns' volatility on current prices. This is substantiated by the majority of ARCH and GARCH summation values exceeding 0.6, indicating a persistent influence from prior periods.

The mean equation results in Table 5 are explored, displaying constant values and lagged return values that reflect how preceding-day returns affect currentday stock returns. Notably, Australia, Germany, and the UK exhibit different lag return values compared

A		Conve	entional	Islamic		
Australia	variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
Maar	С	0.045273	1.124614	-0.106129**	-1.978212	
Mean	Return(-1)	-0.109158**	-2.398701	0.05121	1.128311	
	С	0.091204***	4.717425	2.613812***	12.03063	
	RESID(-1)^2	0.089944***	4.774157	0.137076**	2.248336	
	GARCH(-1)	0.882597***	43.75725	0.511608***	6.862819	
Variance	NCS	-0.00406***	-1.00E+100	-0.000941***	-2.45E+99	
	NDT	-0.03932***	-11.55638	-0.05727***	-3.10E+99	
	R-squared	0.011493		0.014356		
	DW Test	2.091617		2.016408		
Canada	37 11	Conve	entional	Isla	nic	
Canada	variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
Maan	С	0.128943*	1.68137	0.108339	0.868103	
Wiean	RETURN_C(-1)	-0.012263	-0.167317	-0.015362	-0.210034	
	С	4.089404	94.03432***	3.188037	33.24464	
	RESID(-1)^2	0.149805	2.23659**	0.141767	2.040545	
	GARCH(-1)	0.596895	11.0699***	0.555137	9.391461	
Variance	NCS	-0.00011	-9.28E+99***	-0.0002	-1.10E+100	
	NDT	-0.00902	-1.00E+100***	-0.00216	-2.23E+99	
	R-squared	0.014		0.017		
	DW Test	2.304		2.002		

Table 5. GARCH(1 1) results for Developed Economies

		Conve	ntional	Islamic		
France	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
Maan	С	-0.013596	-0.179152	0.055668	0.896349	
Mean	RETURN_C(-1)	-0.174841**	-2.428052	-0.051399	-0.886311	
	С	0.051663***	7.25087	0.048409***	8.242568	
	RESID(-1)^2	0.017894***	3.17185	0.025028***	2.858024	
	GARCH(-1)	0.966565***	129.6318	0.958782***	90.79819	
Variance	NCS	-4.09E-05***	-8.10E+100	-3.94E-05***	-1.67E+99	
	NDT	-0.00043***	-7.84E+98	-0.00253***	-4.506524	
	R-squared	0.002		0.0009		
	DW Test	1.92		1.91		
	37 111	Conve	ntional	Isla	mic	
Germany	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.056489	0.660898	0.043801	0.69516	
Mean	RETURN_C(-1)	0.039774	0.430974	0.004262	0.083526	
	С	1.238243***	9.208405	0.171157***	3.463503	
	RESID(-1)^2	0.584087***	3.201825	0.149809**	1.966506	
Variance	GARCH(-1)	0.126786**	2.202965	0.599348***	5.877509	
	NCS	-2.99E-05***	-3.18E+99	-2.28E-05***	-5.43E+99	
	NDT	-0.00079***	-4.138086	-0.00013**	-2.327084	
	R-squared	0.013		0.0018		
	DW Test	1.93		1.99		
Hong Kong	Variable	Conver	ntional	Isla	mic	
	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
Mean	С	-0.002847	-0.093412	0.041969	1.181202	
wiedh	RETURN_C(-1)	-0.105863***	-2.707609	-0.005932	-0.144178	
	С	1.815317***	111.6207	1.736635***	110.2026	
	RESID(-1)^2	0.063699***	3.458073	0.093972***	4.351112	
	GARCH(-1)	0.488984***	8.923169	0.503964***	11.95174	
Variance	NCS	-7.31E-05***	-1.80E+100	-7.14E-05***	-2.40E+100	
	NDT	-0.00403***	-1.30E+100	-0.00397***	-2.20E+100	
	R-squared	0.008		0.0007		
	DW Test	2.11		2.09		
Italy	Variable	Conve	ntional	Isla	mic	
	variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
Mean	С	0.065484	0.836466	0.103372	1.39722	
wican	RETURN_C(-1)	-0.044381	-0.72104	-0.106805*	-1.733109	
	С	3.712224***	82.00969	3.482631***	10.50627	
	RESID(-1)^2	0.149571**	1.962252	0.149742**	2.057762	
	GARCH(-1)	0.598478***	11.33633	0.597909***	8.681682	
Variance	NCS	-3.14E-05***	-8.93E+99	-3.46E-05***	-9.43E+99	
	NDT	-0.00222***	-2.00E+100	-0.00195***	-5.32E+99	
	R-squared	0.0005		0.0012		
	DW Test	1.99		1.82		

T	37 11	Conver	ntional	Islamic		
Japan	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.108746	1.588907	0.10138*	1.847041	
Mean	RETURN_C(-1)	-0.0935	-1.398767	-0.104986	-1.556243	
	С	1.994333***	5.59308	0.116853***	3.165867	
	RESID(-1)^2	0.131082***	3.201706	0.115202***	3.271504	
	GARCH(-1)	0.515145***	5.505908	0.811645***	16.66384	
Variance	NCS	-0.00018***	-3.485715	-0.0002***	-1.70E+100	
	NDT	-0.00922***	-8.62E+98	-0.00736***	-4.604252	
	R-squared	0.008		0.01		
	DW Test	1.73		1.72		
		Conver	ntional	Isla	nic	
Netherland	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.062985	0.916131	0.208136**	2.186423	
Mean	RETURN_C(-1)	-0.079151	-1.329979	-0.080689	-1.345193	
	С	0.082827***	2.669878	0.142249***	3.086101	
	RESID(-1)^2	0.110204***	5.180469	0.019627	1.178959	
	GARCH(-1)	0.861977***	27.47778	0.949174***	40.96611	
Variance	NCS	-2.68E-05**	-2.039598	-6.15E-06	-1.160032	
	NDT	-0.00037	-9.41E-01	-0.00053	-0.646861	
	R-squared	0.0014		0.0056		
	DW Test	1.93		1.97		
Varias	Variable	Conver	ntional	Islaı	nic	
Korea		Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.136157**	1.973588	0.160293*	1.744413	
Mean	RETURN_C(-1)	-0.039527	-0.62697	-0.070657	-1.140149	
	С	0.403715***	2.943892	0.531297***	4.7731	
	RESID(-1)^2	0.188399***	3.021179	0.2056***	3.799626	
	GARCH(-1)	0.645722***	6.934467	0.641558***	9.186404	
Variance	NCS	-0.00058***	-2.672109	-0.00066***	-1.52E+99	
	NDT(-1)	-0.06163***	-5.36E+98	-0.01352	-0.164055	
	R-squared	0.009		0.01		
	DW Test	2.02		2.02		
New Zeelend	Variable	Conver	ntional	Isla	nic	
New Zealand	variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
Maar	С	0.02545	0.42288	0.049706	0.653865	
Mean	RETURN_C(-1)	0.110772*	1.750456	0.069811	1.220493	
	С	0.699587***	4.916709	0.072109	1.166577	
	RESID(-1)^2	0.212439***	4.551926	0.131393***	3.3296	
	GARCH(-1)	0.413246***	5.121653	0.855323***	16.3595	
Variance	NCS	-0.00096	-0.14504	-0.00197	-0.182637	
	NDT	0.041817	0.185334	-0.00769	-0.012566	
	R-squared	1.40E-02		0.003		
	DW Test	1.9		1.97		

		Conve	ntional	Isla	Islamic		
Singapore	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic		
	С	-0.055044	-0.490377	0.087987	1.163689		
Mean	RETURN_C(-1)	0.005967	0.07488	0.033963	0.588207		
	С	1.304964***	10.62226	0.203406***	3.151627		
	RESID(-1)^2	0.148019***	3.286621	0.136349***	3.444491		
	GARCH(-1)	0.477927***	6.307243	0.721403***	10.87201		
Variance	NCS	-0.0017***	-1.1E+100	0.000268	1.205063		
	NDT	-0.0003	-0.000506	-0.51109***	-2.900088		
	R-squared	0.062		0.0001			
	DW Test	1.96		2			
		Conve	ntional	Isla	mic		
Sweden	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic		
	С	0.085961	1.044291	0.100536	1.211725		
Mean	RETURN_C(-1)	-0.129245*	-1.916298	-0.110672*	-1.647425		
	С	0.073827***	11.61756	0.060221***	9.041665		
	RESID(-1)^2	0.010822***	7.934371	-0.00279**	-2.232058		
	GARCH(-1)	0.975709***	2.20E+101	0.998198***	832.7407		
Variance	NCS	-3.03E-04***	-1.30E+100	-2.31E-04***	-1.10E+100		
	NDT	-0.00101**	-2.587614	-0.00121**	-2.530247		
	R-squared	0.003		0.002			
	DW Test	1.99		2.03			
Spain	Variable	Conve	ntional	Isla	mic		
Span	variable	Coefficient	z-Statistic	Coefficient	z-Statistic		
Maan	С	-0.024382	-0.354979	0.019806	0.285592		
Mean	RETURN_C(-1)	-0.018439	-0.340111	-0.05971	-1.055253		
	С	3.547753***	24.00673	0.112705***	4.236687		
	RESID(-1)^2	0.14999***	1.43671	0.067042***	4.422464		
	GARCH(-1)	0.599942***	8.489441	0.90914***	42.89752		
Variance	NCS(-1)	-8.85E-05***	-3.46E+99	-4.8E-06***	-2.934614		
	NDT(-1)	0.001569***	2.822132	-0.00029***	-2.833852		
	R-squared	0.02		0.03			
	DW Test	1.99		1.96			
UK	Variable	Conve	ntional	Isla	mic		
0K	variable	Coefficient	z-Statistic	Coefficient	z-Statistic		
Mean	С	-0.009339	-0.132626	0.005604	0.072625		
wican	RETURN_C(-1)	-0.053751	-0.827499	0.051931	0.749794		
	С	0.049037***	4.69768	3.814134***	8.888463		
	RESID(-1)^2	0.027646***	2.528138	0.059132***	4.40245		
	GARCH(-1)	0.952121***	69.33327	0.921107***	53.01408		
Variance	NCS	-3.07E-05***	-10.05785	-3.45E-05***	-6.54E+99		
	NDT	-0.00168	-9.70E+100	-0.00137	-3.337248		
	R-squared	0.004		0.013			
_	DW Test	1.91		2			

LIC A		Conventional	l (S&P 500)	Islamic (FTSE)		
USA	variable -	Coefficient	z-Statistic	Coefficient	z-Statistic	
Maria	С	0.167218***	3.037708	0.157246***	2.601671	
Mean	RETURN_SP500(-1)	-0.18719***	-2.939813	-0.170268***	-2.616237	
	С	3.388551***	10.95683	3.51586***	11.75076	
	RESID(-1)^2	0.148943*	1.924292	0.148365**	1.810489	
	GARCH(-1)	0.582962***	7.540464	0.581871***	7.617026	
Variance	NCS	-1.38E-05***	-6.50E+100	-1.44E-05***	-7.70E+100	
	NDT	-0.00024***	-4.64E+99	-0.00025***	-4.37E+99	
	R-squared	0.067		0.07		
	DW Test	2.42		2.25		
LICA	T 7 ' 11	Conventional	(NASDAQ)			
USA	variable -	Coefficient	z-Statistic			
Maan	С	0.209442***	2.74829			
Mean	RETURN_NASDAQ (-1)	-0.200665***	-3.462163			
	С	4.081649***	13.01917			
	RESID(-1)^2	0.146181*	1.860228			
	GARCH(-1)	0.574783***	7.708357			
Variance	NCS	-1.67E-05***	-2.30E+100			
	NDT	-0.00059***	-6.60E+99			
	R-squared	0.087				
	DW Test	2.34				

Table 6. GARCH (1 1) Results for Developing Economies

D	Variable	Conventional		Islamic	
DIAZII		Coefficient	z-Statistic	Coefficient	z-Statistic
Mean	С	0.076887	0.616495	0.154067	1.315607
	RETURN_C(-1)	-0.117431**	-2.088872	-0.064356	-1.123772
	С	10.0933***	5.262398	9.187784***	5.455841
	RESID(-1)^2	0.120069***	4.418991	0.149999***	1.386478
	GARCH(-1)	0.820499***	18.88048	0.599991***	4.35722
Variance	NCS	-0.00011***	-6.1E+100	-9.58E-05***	-1E+100
	NDT	-0.00021***	-2.63E+00	-0.00275***	-2.50E+100
	R-squared	0.015		0.013	
	DW Test	2.137		2.245	
India	Variable	Conventional		Islamic	
India		Coefficient	z-Statistic	Coefficient	z-Statistic
Maan	С	0.125765*	1.65769	0.202711	3.755386
Mean	RETURN_C(-1)	0.030714	0.48014	-0.224546	-5.255922
Variance	С	0.975694***	11.0536	3.239122***	12.20884
	RESID(-1)^2	0.451776***	7.102248	0.148888**	2.186266
	GARCH(-1)	0.181483***	5.11965	0.590781***	9.420103
	NCS	-4.16E-07***	-2.707241	-4.52E-06***	-2.1E+100
	NDT	-2.80E-04***	-3.40E+100	-3.80E-04***	-2.00E+100

	Variable	Conventional		Islamic		
India		Coefficient	z-Statistic	Coefficient	z-Statistic	
	R-squared	0.0023		0.012		
	DW Test	2.11		2.21		
	Variable	Conver	ntional	Islamic		
Indonesia		Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	-0.065365*	-1.720919	-0.077219	-0.325397	
Mean	RETURN_C(-1)	0.044378	1.021234	0.046196	0.338629	
	С	2.025991***	11.31061	0.272777***	2.944664	
	RESID(-1)^2	0.469116***	4.70575	0.244833***	3.829599	
	GARCH(-1)	0.15255***	3.498137	0.680353***	8.760455	
Variance	NCS	-0.00011***	-3.98E+99	-7.01E-05***	-3.010319	
	NDT	-0.00427***	-6.31E+99	-0.00203***	-3.58681	
	R-squared	2.70E-02		2.50E-03		
	DW Test	1.96		1.93		
	37 11	Conventional		Islamic		
Malaysia	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	-0.127714**	-2.398248	-0.125576**	-2.027528	
Mean	RETURN_C(-1)	0.036708	0.696346	0.033313	0.59473	
	С	0.040324***	4.105482	1.175143***	5.149323	
	RESID(-1)^2	0.070379***	3.992543	0.243775***	2.779791	
	GARCH(-1)	0.894656***	42.435	0.162033	1.066573	
	NCS	-1.37E-05***	-2.9E+100	-0.00011***	-4.17287	
Variance	NDT	0.000681***	5.29E+99	-0.00122***	-1.82E+99	
	R-squared	0.0027		0.006		
	DW Test	1.87		1.9		
Marria		Conver	ntional	Islamic		
Mexico	variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.024788	0.212616	0.170771*	1.767984	
Mean	RETURN_C(-1)	0.046524	0.778469	0.062947	0.984827	
	С	4.12611***	3.1235	1.717819***	8.780637	
	RESID(-1)^2	0.108456	1.411462	0.126786***	1.468984	
	GARCH(-1)	0.501808***	2.994669	0.376763***	5.285728	
Variance	NCS	-0.00013***	-1.1E+100	-0.00018***	-1.4E+100	
	NDT	-0.00133*	-1.708032	0.001267***	6.13E+99	
	R-squared	0.0014		0.0056		
	DW Test	1.93		1.97		
	Variable	Conver	Conventional		Islamic	
Pakistan		Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.126386**	2.227095	0.010902	0.198151	
Mean	RETURN_C(-1)	0.102945*	1.719405	0.091746*	1.889137	

Delviston	Variable	Conventional		Islamic		
Pakistan		Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.134764***	3.689298	1.069949***	5.235712	
	RESID(-1)^2	0.085031***	2.890857	0.094326***	3.313688	
	GARCH(-1)	0.847211***	25.52919	0.528499***	7.259776	
Variance	NCS	-1.46E-05*	-1.912954	-0.00012***	-3.749843	
	NDT	-0.00324***	-3.74E+99	-0.00239***	-2.5E+100	
	R-squared	0.023		0.0003		
	DW Test	1.98		2.19		
	Variable	Conventional		Islan	nic	
Qatar		Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.025882	0.543788	-0.155459**	-2.287086	
Mean	RETURN_C(-1)	-0.02535	-0.333384	-0.412114***	-3.501854	
	С	0.021	11.18952	1.27564	4.299035	
	RESID(-1)^2	-0.005	-3E+100	0.142457	1.161542	
	GARCH(-1)	0.9901	3.6E+102	0.587169	5.458176	
Variance	NCS	0	-8.928805	-0.0005	-2.87548	
	NDT	-0.03	-4.41E+99	-0.00782	-8.35E+99	
	R-squared	0.008		0.0071		
	DW Test	2.06		2.06		
Bussie	Variable	Conventional		Islan	Islamic	
Kussia		Coefficient	z-Statistic	Coefficient	z-Statistic	
Maan	С	0.062506	0.713468	0.066757	0.736505	
Mean	RETURN_C(-1)	8.29E-02	1.202872	6.15E-02	9.65E-01	
	С	0.173707***	2.619035	0.142353***	3.057116	
	RESID(-1)^2	0.108908***	4.854132	0.079922***	4.164687	
	GARCH(-1)	0.853689***	29.2255	0.889956***	39.66122	
Variance	NCS	8.98E-06*	1.786855	9.42E-07	0.334344	
	NDT	-0.00051**	-2.21266	-0.00098**	-2.146977	
	R-squared	0.012		0.0036		
	DW Test	1.86		2.08		
Cardle A fries	Variable	Conventional		Islamic		
South Africa		Coefficient	z-Statistic	Coefficient	z-Statistic	
Maan	С	0.190892***	2.810857	0.118853	1.082958	
Mean	RETURN_C(-1)	0.062335	1.28E+00	0.01687	0.251178	
Variance	С	3.15759***	8.144585	2.766753***	25.67265	
	RESID(-1)^2	0.466023***	3.994228	0.569749***	5.702195	
	GARCH(-1)	0.077326***	2.672822	0.135491**	2.425526	
	NCS	-7.27E-05**	-2.051179	-0.000151***	-5.74E+98	
	NDT	-0.00151***	-7.4E+99	-0.000109***	-8.34E+98	
	R-squared	0.006		0.015		
	DW Test	2.01		2.98		

	Variable	Conventional		Islamic		
Saudi Arabia		Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.129292***	2.661295	0.126181**	2.510775	
Mean	RETURN_C(-1)	0.042969	0.702576	0.045343	0.722248	
	С	1.39E+00***	2.88E+00	1.449121***	2.948217	
	RESID(-1)^2	0.139328*	1.71861	0.138162*	1.761929	
	GARCH(-1)	0.55809***	3.800899	0.556553***	3.905607	
Variance	NCS	-0.00013***	-3E+100	-0.00017***	-7.2E+99	
	NDT	-0.02366***	-8.9E+100	-0.01556***	-1.3E+100	
	R-squared	0.02		0.0017		
	DW Test	2.01		1.97		
	37 11	Conver	Conventional		Islamic	
Taiwan	Variable	Coefficient	z-Statistic	Coefficient	z-Statistic	
	С	0.196996***	2.697047	0.210868**	2.429695	
Mean	RETURN_C(-1)	0.022185	0.343759	-0.007702	-0.12505	
	С	0.721295***	6.252498	1.021013***	3.074552	
	RESID(-1)^2	1.34E-01***	3.138034	0.110159**	1.958668	
	GARCH(-1)	0.487491***	6.15E+00	0.548576***	3.741851	
Variance	NCS	-3.69E-05***	-7.59E+99	-4.12E-05	-2.64708	
	NDT	-0.0003	-1.31716	-0.00094	-1.34	
	R-squared	0.01		0.009		
	DW Test	1.94		1.98		
Thailand	Variable	Conver	ntional	Islar	nic	
		Coefficient	z-Statistic	Coefficient	z-Statistic	
Mean	С	-0.042766	-0.212003	-0.004476	-0.020067	
wican	RETURN_C(-1)	-0.053368	-0.436313	-0.028672	-0.257906	
	С	2.440693***	8.13036	1.841808***	9.642259	
	RESID(-1)^2	0.37566***	3.995606	0.604105***	5.289399	
	GARCH(-1)	0.234009***	4.146609	0.224767***	5.312708	
Variance	NCS	-2.70E-04***	-4.00E+100	-1.80E-04***	-5.75E+99	
	NDT	-0.0499***	-9.01E+00	-0.02566***	-8.20E+99	
	R-squared	0.0004		0.001		
	DW Test	2.2		2.23		
Turkey	Variable	Conventional		Islamic		
Turkey		Coefficient	z-Statistic	Coefficient	z-Statistic	
Maar	С	-0.015546	-0.127824	-0.015639	-0.097256	
Mean	RETURN_C(-1)	0.089037	2.909696	-0.022308	-0.195024	
	С	4.84981***	5.071588	2.964133***	11.30825	
	RESID(-1)^2	-0.03115***	-2.64E+99	0.037303	0.981	
	GARCH(-1)	2.06E-01	1.30E+00	0.476438***	8.187944	
Variance	NCS	0.000121***	2.95E+00	0.0000311***	2.68E+98	
	NDT	-0.02307***	-5.264086	-0.01481***	-3.7E+100	
	R-squared	0.004		0.008		
	DW Test	2.03		1.98		

LIAE	Variable	Conventional		Islamic	
UAE		Coefficient	z-Statistic	Coefficient	z-Statistic
Mean	С	0.000102	0.00616	0.088943**	1.944639
	RETURN_C(-1)	0.114188***	2.948186	0.044174	0.785434
	С	0.88682***	8.005839	0.644763***	6.676313
	RESID(-1)^2	0.351679***	3.933647	0.251194***	3.741941
	GARCH(-1)	0.361002***	4.482149	0.458032***	6.040759
Variance	NCS	-1.82E-04***	-3.49E+99	-9.69E-05***	-6.06E+99
	NDT	-0.0149***	-3.89E+99	-0.02132	-6.66E+99
	R-squared	0.029		0.026	
	DW Test	1.81		1.9	
<u> </u>	Variable	Conventional (Shanghai Composite)		Islamic (FTSE)	
China –	Variable (SE)	Coefficient	z-Statistic	Coefficient	z-Statistic
	С	0.058979	1.155164	0.091866	1.391676
Mean	RETURN_SE(-1)	0.050962	0.808068	0.06821	1.136274
	С	0.904438***	3.579411	0.617883***	5.924105
	RESID(-1)^2	0.114219**	2.430282	0.48595***	4.973335
	GARCH(-1)	0.75428***	10.7033	0.249831***	3.75E+00
Variance	NCS	-0.00017**	-2.188626	-6.97E-05***	-4.12E+99
	NDT(-1)	-0.00715***	-8.03E+99	-0.008236**	-1.95972
	R-squared	0.0044		0.0035	
	DW Test	2.037		2.074	
<u> </u>	Variable	Conventional (Shenzhen)			
China		Coefficient	z-Statistic		
	С	0.120276	1.617241		
Mean	RETURN_SZ(-1)	0.102384	1.431774		
Variance	С	0.494923***	3.261099		
	RESID(-1)^2	0.165329***	2.861993		
	GARCH(-1)	0.605838***	7.615218		
	NCS(-1)	-0.00029*	-1.77976		
	NDT(-1)	-0.02516***	-8.64E+99		
	R-squared	0.0014			
	DW Test	2.023			

to other countries, signifying higher volatility and arbitrage opportunities within these markets between conventional and Islamic indices. Conversely, most other countries, excluding New Zealand and Singapore, manifest negative coefficients for both indices, suggesting that current-day returns do not align with lagged returns due to heightened volatility. In developing countries, except for India, Taiwan, and Turkey, lagged returns demonstrate consistent effects on current-day returns, indicative of substantial volatility. Conversely, the remaining countries, except Thailand, depict a positive relationship between lagged returns and current-day returns.

Comparing mean results between developed and developing countries reveals distinct patterns. Developed economies primarily show a negative relationship between lagged returns and stock returns, indicative of high volatility, whereas developing economies, with a few exceptions, exhibit a positive relationship between lagged returns and next-day stock returns. These results underscore the presence of heightened volatility attributed to COVID-19 pandemic news.

Furthermore, Tables 5 and 6 present variance results in the GARCH (1, 1) model's second segment. These results encompass "Residual," indicating ARCH outcomes, which model the variance volatility stemming from previous day news shocks. Concurrently, GARCH assesses volatility based on both prior series returns and prior time series volatility. The study observes that most ARCH and GARCH (1, 1) values attain statistical significance, signifying substantial volatility during the COVID-19 pandemic period. This aligns with the findings derived from the mean equation, reaffirming the notable presence of volatility in stock return series, with variations between conventional and Islamic indices.

Examining GARCH and ARCH values provides valuable insights into the impact of volatility and news shocks from previous periods on stock market indices. In the developed group of countries, there are distinct patterns in GARCH values for Islamic and conventional indices. For example, Islamic indices in Australia, Canada, France, Korea, the UK, and the USA tend to have lower GARCH values, indicating relatively lower volatility. However, in the remaining developed countries, GARCH values are generally higher for Islamic indices compared to conventional ones, suggesting that Islamic indices are more volatile in these countries.

In contrast, when looking at the developing group of countries' results in Table 6, a different trend emerges. Islamic indices in countries such as Brazil, Malaysia, Mexico, Pakistan, Qatar, Saudi Arabia, Thailand, and China tend to exhibit lower GARCH values compared to their conventional counterparts. This implies that, in these developing nations, the impact of previous period volatility is weaker on Islamic indices than on conventional ones. However, in other developing countries, conventional indices have lower GARCH values, indicating that they are less affected by previous period volatility compared to Islamic indices.

To gain a comprehensive view of the combined impact of the previous day's returns and news shocks, we consider the (ARCH+GARCH) values. In the developed group, only Australia, Canada, and the Netherlands have lower (ARCH+GARCH) values for Islamic indices, indicating that, on average, Islamic indices are less influenced by the combined volatility of returns and news shocks in these countries. In the remaining developed countries, (ARCH+GARCH) values are higher for Islamic indices, indicating that they are more affected by past volatility.

Conversely, in the developing group of countries, the majority, including Brazil, China, UAE, Qatar, Saudi Arabia, Malaysia, Mexico, and Pakistan, exhibit lower (ARCH+GARCH) values for Islamic indices. This suggests that in these developing nations, the combined impact of the previous day's returns and news shocks is less pronounced on Islamic indices compared to conventional ones. However, in other developing countries, conventional indices have lower (ARCH+GARCH) values, indicating that they are less influenced by past volatility compared to Islamic indices.

A noteworthy observation is the differential impact of the number of COVID-19 cases (NCS) and the number of deaths (NDT) on both Islamic and conventional indices within the same country. For instance, in Australia, NCS and NDT have a more significant negative impact on Islamic indices compared to conventional ones. In contrast, in Canada, NCS affects the conventional index more, while NDT has a higher impact on the Islamic index. These variations highlight the intricate relationship between COVID-19 factors and stock indices' performance in different countries.

Examining developed countries like France, Germany, Hong Kong, Italy, Singapore, Sweden, and Spain, it becomes evident that COVID-19 cases have a strong negative impact on conventional indices, while other countries show stronger impacts on Islamic indices. A similar pattern is observed for COVID-19 deaths, with some exceptions. For example, in the US, the US-FTSE 100 is more affected by cases and deaths compared to the S&P 500 but less affected than the US-NASDAQ.

In developing economies, there are varying degrees of impact from COVID-19 cases and deaths on both Islamic and conventional indices. Some countries exhibit a higher negative impact from cases on conventional indices, while others are more affected on Islamic indices. The same variability applies to the impact of deaths, with differences among countries.

Taiwan, Singapore, and New Zealand, which reported fewer COVID-19 cases, display weak impacts from both cases and deaths on their stock indices. These results underscore that the effect of COVID-19 factors on Islamic and conventional indices varies, presenting opportunities for investors and arbitrageurs.

Summing up the analysis we can state that Islamic indices outperform the conventional in the majority of developing countries, while in developed countries this trend is not that common except few countries. Hence the results support our hypothesis H1, which supposed that Islamic indices perform better than conventional ones. But in a few countries, the results do not support hypothesis H1, because the conventional indices in these countries outperform the Islamic ones. Our results are in line with those by Ryandono et al. (2021); Milly and Sultan (2012); Bannigidadmath (2015); Azad et al. (2018); Ebrahim et al. (2016); Arif et al. (2021), who argued that due to the presence of Islamic stocks in slow responding markets, they perform well as compared to the conventional ones. Meanwhile, our results are contradicting Yarovaya et al. (2020b) who argued that Islamic indices are more sensitive to crises.

V. Robustness

To check the authenticity of our results and to verify the argument that, there is a difference in returns of Islamic and conventional stock indices we apply the Mann-Whitney U test or Wilcoxon rank-sum. The Mann-Whitney U test is a non-parametric test used to compare two independent samples and determine if there is a statistically significant difference between their distributions. It assesses whether one group tends to have higher or lower values than the other, without assuming any specific distribution shape. Mann-Whitney test can tell us if there is any difference in the means of the two types of indices

 Table 7. Mann-Whitney U test or Wilcoxon rank-sum test results for Developed Countries

Country	Z	Prob > z	
Australia	-20.088	0.0000	
Canada	-23.764 0.		
France	-23.953	0.0000	
Germany	-23.828	0.0000	
Hong Kong	-17.191	0.0000	
Italy	-23.890	0.0000	
Japan	23.351	0.0000	
Korea	23.574	0.0000	
Netherland	23.953	0.0000	
New Zealand	-23.670	0.0000	
Singapore	23.890	0.0000	
Spain	-23.953	0.0000	
Sweden	23.701	0.0000	
UK	-23.796	0.0000	
US Nasdaq	-23.796	0.0000	
USsp500	-4.699	0.0000	
Brazil	-23.574	0.0000	
China (SE)	23.543	0.0000	
China (SZ)	23.543	0.0000	
India	23.670	0.0000	
Indonesia	-23.228	0.0000	
Malaysia	16.984	0.0000	
Mexico	-23.733	0.0000	
Pakistan	22.999	0.0000	
Qatar	-23.922	0.0000	
Russia	23.733	0.0000	
Saudi Arabia	-23.733	0.0000	
South Africa	-23.701	0.0000	
Taiwan	Taiwan -23.254		
Thailand	-23.254	0.0000	
Turkey	23.733	0.0000	
UAE	-23.700	0.0000	

for each country or not. If the results are significant then we can claim that our results are robust and there is actually a difference between the mean values of Islamic and conventional stock indices.

Table 7 show the results of the Mann-Whitney test. The results show that there is a significant difference between the distribution of the two groups. We test each conventional index with another Islamic index in each country. The results for both Islamic and conventional indices are significant, which means that our results are robust and we can claim that the Islamic and conventional indices have different distribution patterns in each country. Hence Islamic indices can serve as safe havens for investors.

VI. Conclusion

This study delves into the performance of Islamic and conventional stock indices during the COVID-19 pandemic and reveals intriguing findings. Islamic stocks often outperformed conventional ones during crisis periods and exhibited strong post-crisis recovery in many countries. However, long-term results varied. While Islamic stocks-maintained dominance in some places, conventional stocks took the lead in others. Cumulatively, Islamic stocks tended to recover more quickly than conventional indices in several countries, especially during the initial quarters of 2020. Still, over the long term, conventional stocks prevailed.

Notably, Islamic indices displayed lower volatility in developing nations, offering a potential safe haven for investors. However, only a few developed countries showed similar patterns. Surprisingly, Islamic indices were more affected by negative shocks in some countries but recovered faster, implying higher risk and potential arbitrage opportunities for investors.

The impact of COVID-19 cases and deaths on these indices varied by country, creating arbitrage possibilities during crisis periods. Developing economies generally favored Islamic indices, while developed ones exhibited mixed responses. During the second quarter of 2020, Islamic indices outperformed conventional counterparts in many countries.

In conclusion, Islamic indices provide attractive arbitrage opportunities for investors, particularly in developing nations and during crisis periods. They can also serve as short-term safe-havens. However, conventional indices tend to dominate in the long run, albeit with variations across countries.

This study provides valuable insights into stock market behavior during crises, particularly during the Covid-19 pandemic. It differs from previous research by examining a wide range of countryspecific indices, offering a more detailed perspective. Additionally, it contributes practical knowledge for investors looking to capitalize on opportunities presented by the unique behavior of Islamic stocks worldwide. Unlike earlier studies that focused on short-term events, this study covers a significant time frame, including both the crisis and recovery phases of the pandemic. Overall, it enriches the literature by expanding the scope of analysis and providing practical insights for investors.

References

- Abbes, M. B. (2012). Risk and return of Islamic and conventional indices. *International Journal of Euro-Mediterranean Studies*, 5, 1-23.
- Abdullah, F., Hassan, T., & Mohamed, S. (2007). Investigation of the performance of Malaysian Islamic unit fund trusts, comparison with conventional unit fund trusts. *Management Finance*, 33, 142-153.
- Abushammala, S. N. M. (2022). The impact of the COVID-19 pandemic on household financial well-being. *Global Business and Finance Review*, 27(4), 65-80.
- Ahmad Z., & Ibrahim H. (2002). A study of the performance of the KLSE Syari'ah index. *Malaysian Management Journal*, 6(1), 25-34.
- Alam, M., & Ansari, V. A. (2020). Are Islamic indices a viable investment avenue? An empirical study of Islamic and conventional indices in India. *International Journal* of Islamic and Middle Eastern Finance and Management, 13(3), 503-518. doi:10.1108/IMEFM-03-2019-0121

- Alam, Mn., Alam, Ms., & Chavali, K. (2020). Stock market response during COVID-19 lockdown period in India: An event study. *The Journal of Asian Finance, Economics* and Business, 7(7), 131-137. doi:10.13106/JAFEB.2020.V OL7.NO7.131
- Alber, N. (2020). The effect of coronavirus spread on stock markets: The case of the worst six countries. SSRN, 3578080. https://ssrn.com/abstract=3578080 or doi:10.2139/ssrn.35 78080
- Al-Khazali, O., Lean, H. H., & Samet, A. (2014). Do Islamic stock indexes outperform conventional stock indexes? A stochastic dominance approach. *Pacific Basin Finance Journal*, 28, 29-46.
- Al-Zoubi, H., & Maghyereh, A. I. (2007). The relative risk performance of Islamic finance: A new guide to less risky investments. *International Journal of Theoretical & Applied Finance*, 10, 235-249.
- Alzyadat, J. A., & Asfoura, E. (2021). Relationship between Islamic stocks and conventional stock sectors during normal and crisis periods: Extreme co-movements and portfolio management analysis. *Journal of Asian Finance, Economics and Business*, 8(5), 913-921.
- Arif, M., Naeem, M. A., Hasan, M., Alawi, S. M., & Taghizadeh-Hesary, F. (2021). Pandemic crisis versus global financial crisis: Are Islamic stocks a safe-haven for G7 markets? *Economic Research-Ekonomska Istraživanja*, 35(1), 1707-1733. doi:10.1080/1331677X.2021.1910532
- Ashraf, D., & Mohammad, N. (2014). Matching perception with the reality - Performance of Islamic equity investments. *Pacific-Basin Finance Journal*, 28, 175-189.
- Assefa, T. A., & Jackson, D. (2010). The relative performance of ADRs and U.S. stocks in October 2007 and October 2008. *Global Business & Finance Review*, 15(2). https://ssr n.com/abstract=2208117
- Azad, A., Azmat, S., Chazi, A., & Ahsan, A. (2018). Sailing with the non-conventional stocks when there is no place to hide. *Journal of International Financial Markets*, *Institutions, and Money*, 57, 1-16. doi:10.1016/j.intfin.201 8.04.001
- 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. doi:10.1093/rapstu/raaa008
- Bashir, B. A. (1983). Portfolio management of Islamic banks: Certainty model. *Journal of Banking and Finance*, 7, 339-354.
- Bialkowski, J., Etebari, A., Wisniewski, T. P. (2012). Fast profits: Investor sentiment and stock returns during Ramadan. *Journal of Banking & Finance*, 36, 835-845.
- Bollerslev, T. (1986). Generalized autoregressive conditional heteroskedasticity. *Journal of Econometrics*, 31(3), 307-327. doi:10.1016/0304-4076(86)90063-1
- Cao, K. H., Li, Q., Liu, Y., & Woo, C. K. (2020). Covid-19s adverse effects on a stock market index. *Applied Economics Letters*, 28(14), 1157-1161. doi:10.1080/13504851.2020.1 803481

- Chen, D., & Huang, B. (2012). Financial crises and stock market indices: Markov switching approach. *Global Business and Financial Review*, 17, 101-120.
- Corbet, S., Larkin, C., & Lucey, B. (2020). The contagion effects of the COVID-19 pandemic: Evidence from gold and cryptocurrencies. *Finance Research Letters*, 35, 101554. doi:10.1016/j.frl.2020.101554
- Derigs, U., & Marzban, S. (2008). Review and analysis of current Shariah-compliant equity screening practices. *International Journal of Islamic and Middle Eastern Finance and Management*, 1(4), 285-303.
- Ebrahim, M. S., Jaafar, A., Omar, F. A., & Salleh, M. O. (2016). Can Islamic injunctions indemnify the structural flaws of securitized debt? *Journal of Corporate Finance*, 37, 271-286. doi:10.1016/j.jcorpfin.2016.01.002
- Engle, R. (1982). Autoregressive conditional heteroskedasticity with estimates of United Kingdom inflation. *Econometrica*, 50(4), 987-1008.
- Girard, E. C., & Hassan, M. K. (2008). Is there a cost to faith-based investing: Evidence from FTSE Islamic indices? *Journal of Investing*, 17, 112-121.
- Gormsen, N. J., & Koijen, R. S. (2020). Coronavirus: Impact on stock prices and growth expectations. *The Review of Asset Pricing Studies*, 10(4), 574-597. doi:10.1093/rapstu/raaa013
- Hakim, S., & Rashidian, M. (2002). Risk and return of Islamic stock market. In *Paper presented at the Presentation to Economic Research Forum Annual Meetings*, Sharjah, UAE.
- Hammoudeh, S., Kim, W. J., & Sarafrazi, S. (2016). Sources of fluctuations in Islamic, U.S., EU and Asia equity markets: The roles of economic uncertainty, interest rates. *Emerging Markets Finance and Trade*, 52, 1195-1209.
- Hammoudeh, S., Mensi, W., Reboredo, J. C., & Nguyen, D. K. (2014). Dynamic dependence of the global Islamic equity index with global conventional equity market indices and risk factors. *Pacific-Basin Finance Journal*, 30, 189-206. doi:10.1016/j.pacfin.2014.10.001
- Hayat, R., & Kraeussl, R. (2011). Risk and return characteristics of Islamic equity funds. *Emerging Markets Review*, 12, 189-203.
- He, Q., Liu, J., Wang, S., & Yu, J. (2020). The impact of COVID-19 on stock markets. *Economic and Political Studies*, 8(3), 275-288. doi:10.1080/20954816.2020.1757570
- Ho, C. S. F., Rahman, N. A. A., Yusuf, N. H. M., & Zamzamin, Z. (2014). Performance of global Islamic versus conventional share indices: International evidence. *Pacific-Basin Finance Journal*, 28, 110-121.
- Hoepner, A., Rammal, H., & Rezec, M. (2011). Islamic mutual funds' financial performance and international investment style: Evidence from 20 countries. *European Journal of Finance*, 17, 829-850.
- Hussein, K. A. (2004). Ethical investment: Empirical evidence from FTSE Islamic index. *Islamic Economic Studies*, 12(1), 21-40.
- Hussein, K., & Omran, M. (2005). Ethical investment revisited:

Evidence from Dow Jones Islamic indexes. *Journal of Investment*, 14(3), 105-124.

- Jawadi, F., Jawadi, N., & Louchichi, W. (2014). Conventional and Islamic stock price performance: An empirical investigation. *International Economics*, 137, 73-87.
- Jithendranathan, T. (2008). Homogeneous beliefs, trading volume and co-movements of stock market returns: A study of Russian and the US markets. *Global Business* and Finance Review, 13(1), 23-34. https://ssm.com/abstrac t=1670745
- Karsten, I. (1982). Islam and financial intermediation. *IMF Staff Papers*, 29, 108-142.
- Khamis Hamed Al-Yahyaee, Mensi, W., Rehman, M. U., Vo, X. V., & Kang, S. H. (2020). Do Islamic stocks outperform conventional stock sectors during normal and crisis periods? Extreme co-movements and portfolio management analysis. *Pacific-Basin Finance Journal*, 62, 101385.
- Khan, K., Zhao, H., Zhang, H., Yang, H., Shah, M. H., & Jahanger, A. (2020). The impact of COVID-19 pandemic on stock markets: An empirical analysis of world major stock indices. *Journal of Asian Finance, Economics and Business*, 7(7), 463-474.
- Khanthavit, A. (2020). Measuring COVID-19 effects on world and national stock market returns. *Journal of Asian Finance, Economics and Business*, 8(2), 1-13.
- Kim, J., & Shamsuddin, A. (2008). Are Asian stock markets efficient? Evidence from new multiple variance ratio tests. *Journal of Empirical Finance*, 15, 518-532.
- Kinateder, H., Campbell, R., & Choudhury, T. (2021). Safe haven in GFC versus COVID-19: 100 turbulent days in the financial markets. *Finance Research Letters*, 43, 101951.
- Majdoub, J., & Mansour, W. (2014). Islamic equity market integration and volatility spillover between developing and US stock markets. *The North American Journal of Economics and Finance*, 29, 452-470.
- Mann, H. B., & Whitney, D. R. (1947). On a test of whether one of two random variables Is stochastically larger than the other. *Annals of Mathematical Statistics*, 18, 50-60. doi:10.1214/aoms/1177730491
- Milly, M., & Sultan, J. (2012). Portfolio diversification during the financial crisis: Analysis of faith-based investment strategies. In *Building bridges across the financial communities: The global financial crisis, social responsibility, and faith-based finance* (pp. 334-352). Harvard Law School, Islamic Finance Project.
- Narayan, P. K., & Bannigidadmath, D. (2015). Does financial news predict stock returns? New evidence from Islamic

and non-Islamic stocks. *Pacific-Basin Finance Journal*, 35, 18-36. doi:10.1016/j.pacfin.2015.12.009

- Phillips, P. C. B., & Perron, P. (1988). Testing for a unit root in time series regression. *Biometrika*, 75(2), 335-346. doi:10.1093/Biomet/75.2.335
- Rahman, M. L., Amin, A., & Al Mamun, M. A. (2021). The COVID-19 outbreak and stock market reactions: Evidence from Australia. *Finance Research Letters*, 38, 101832. doi:10.1016/j.frl.2020.101832
- Raphie, H., & Roman, K. (2011). Risk and return characteristics of Islamic equity funds. *Developing Markets Review*, 12, 189-203.
- Ryandono, M. N. H., Muafi, M., & Guritno, A. (2021). Shariah stock reaction against COVID-19 pandemic: Evidence from Indonesian capital markets. *The Journal* of Asian Finance, Economics, and Business, 8(2), 697-710. doi:10.13106/JAFEB.2021.VOL8.NO2.0697
- Said, S. E., & Dickey, D. A. (1984). Testing for unit roots in autoregressive-moving average models of unknown order. *Biometrika*, 71(3), 599-607. doi:10.2307/2336570
- Salman, A., & Ali, Q. (2021). Covid-19 and its impact on the stock market in GCC. Journal of Sustainable Finance & Investment. doi:10.1080/20430795.2021.1944036
- Sansa, N. A. (2020). The impact of the COVID-19 on the financial markets: Evidence from China and USA. *Electronic Research Journal of Social Sciences and Humanities*, 2(2), 29-39. doi:10.2139/ssrn.3567901
- Shamsuddin, A. (2014). Are Dow Jones Islamic equity indices exposed to interest rate risk? *Economic Modelling*, 39, 273-281.
- Sherif, M. (2020). The impact of Coronavirus (COVID-19) outbreak on faith-based investments: An original analysis. *Journal of Behavioral and Experimental Finance*, 28, 100403.
- Wilcoxon, F. (1945). Individual comparisons by ranking methods. *Biometrics Bulletin*, 1(6), 80-83. doi:10.2307/3001968
- Yarovaya, L., Elsayed, A. H., & Hammoudeh, S. (2021). Determinants of spillovers between Islamic and conventional financial markets: Exploring the safe haven assets during the COVID-19 pandemic. *Finance Research Letters*, 38, 101979.
- Yarovaya, L., Matkovskyy, R., & Jalan, A. (2020). The COVID-19 black swan crisis: Reaction and recovery of various financial markets. SSRN Electronic Journal. https://ssrn.com/abstract=3611587