

# Flight to Quality from Islamic Stocks to Sukuk: Are Islamic Investors Worse off During a Crisis?

*(Peralihan ke Aset Berkualiti dari Saham Islam ke Sukuk: Adakah Pelabur Islam Lebih Terjejas Semasa Krisis?)*

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## ABSTRACT

*This study examines flight-to-quality behaviour from Shariah-compliant stocks (Islamic stocks) to sukuk during a crisis and determines whether Islamic investors, who are restricted to Shariah-compliant assets, are at a disadvantage compared with conventional investors. By conducting dynamic conditional correlation (DCC) analysis, this research investigates the correlations between global sukuk, bonds, stocks, Islamic stock indices and gold prices from January 2020 to May 2021. The data are sourced from Bloomberg and the Standard and Poor website. This study focuses on the COVID-19 pandemic period and captures its significant impact on global financial markets and investor behaviour. The findings reveal that whilst flight to quality from Islamic stocks to sukuk occurred initially, the correlations between the assets became positive as the market downturn continued, which indicates limited long-term benefits. Sukuk demonstrated lower volatility and faster mean reversion compared with conventional and Islamic stocks, which highlights their risk management and portfolio diversification potential. Despite this, Islamic investors were not necessarily worse off during the crisis. The initial flight to quality suggests that Islamic investors can find refuge in sukuk, which can stabilise their portfolio. However, as the downturn persisted and correlations increased, the benefits diminished, which indicates that though sukuk can manage certain risks, they cannot completely shield Islamic investors from market downturns. This study contributes to the limited literature on Islamic capital market instruments during a crisis and demonstrates the utility of DCC MGARCH analysis in capturing dynamic relationships between asset classes. This research underscores the strategic importance of sukuk in managing risks and enhancing portfolio diversification during market downturns. The findings can inform investment strategies for resilience against financial crises and highlight the need to understand investor behaviour and sentiment in Islamic finance (i.e. behavioural finance).*

*Keywords: Sukuk; islamic stock; portfolio diversification; risk management*

## ABSTRAK

*Kajian ini meneliti fenomena peralihan ke aset berkualiti daripada saham patuh syariah (saham Islam) kepada sukuk semasa krisis, dengan menilai sama ada pelabur Islam, yang terhad kepada aset patuh syariah, berada dalam keadaan tidak menguntungkan berbanding pelabur konvensional. Menggunakan analisis korelasi bersyarat dinamik (DCC-MGARCH), kajian ini mengangkar korelasi antara sukuk global, bon, saham, indeks saham Islam, dan harga emas harian bagi tempoh Januari 2020 hingga Mei 2021. Kajian ini memberi tumpuan kepada tempoh pandemik COVID-19, yang memberikan impak besar terhadap pasaran kewangan global dan tingkah laku pelabur. Data diperolehi daripada pangkalan data Bloomberg dan Standard and Poor (S&P). Penemuan menunjukkan bahawa walaupun terdapat peralihan ke aset berkualiti awal dari saham Islam ke sukuk, korelasi antara aset-aset ini menjadi positif apabila kemerosotan pasaran berterusan, menunjukkan manfaat jangka panjang yang terhad. sukuk menunjukkan volatiliti yang lebih rendah dan pemulihan purata yang lebih cepat berbanding dengan saham konvensional dan Islam, menonjolkan potensinya untuk pengurusan risiko dan kepelbagaian portfolio. Walaupun demikian, pelabur Islam tidak semestinya berada di kedudukan yang kurang baik semasa krisis. Peralihan kepada aset berkualiti pada peringkat awal mencadangkan bahawa pelabur Islam boleh beralih kepada sukusukuk untuk menstabilkan portfolio. Walau bagaimanapun, apabila kemerosotan berterusan dan korelasi meningkat, manfaatnya berkurang, menunjukkan bahawa walaupun sukuk menyediakan beberapa pengurusan risiko, mereka tidak sepenuhnya melindungi pelabur Islam dari kemerosotan pasaran. Kajian ini menyumbang kepada pengayaan literatur mengenai instrumen pasaran modal Islam semasa krisis COVID-19 dan menunjukkan kesesuaian penggunaan analisis DCC-MGARCH bagi menggambarkan hubungan dinamik antara kelas aset. Penyelidikan ini menekankan kepentingan strategik sukuk dalam menguruskan risiko dan meningkatkan kepelbagaian portfolio semasa*

*kemerosotan pasaran. Penemuan ini memberi maklumat kepada strategi pelaburan yang bertujuan untuk ketahanan terhadap krisis kewangan dan menyoroti keperluan untuk memahami tingkah laku pelabur dan sentimen dalam kewangan Islam.*

*Kata kunci: Sukuk; saham islam; kepelbagaian portfolio; pengurusan risiko*

JEL: G01; G11; G12; G15; C58; E44

## INTRODUCTION

Declared by the WHO on 11 March 2020, the COVID-19 pandemic significantly impacted global financial markets and led investors to seek safe investments (Zhang et al. 2020). The pandemic crisis, coupled with fears of a prolonged economic downturn, negatively affected equity markets and heightened their volatility (Ashraf et al. 2020). In mid-March 2020, the CBOE Volatility Index (VIX), which measures market expectations of near-term volatility and is typically called the 'fear gauge', soared to its second-highest level since the 2008 financial crisis, which reflected heightened investor uncertainty (Shehzad et al. 2020). The developments emphasise the need to examine how Islamic stocks and sukuk performed during the crisis, particularly, in terms of risk mitigation, portfolio diversification and investor behaviour. The evaluation of the stability provided by sukuk during such uncertain times can offer insights into the resilience of Islamic capital market instruments compared with that of conventional assets.

Islamic finance, which is based on principles such as risk sharing and the prohibition of *riba* (interest), has gained considerable attention for its perceived stability and low risk, especially during a financial crisis (Uddin et al. 2020). Sukuk, or Islamic bonds, can be structured in various ways, such as asset backed and asset based or through profit-sharing and profit-and-loss-sharing models. Although some sukuk are asset backed and can promote risk sharing between issuers and investors (Bhuiyan et al. 2020), others may not have a direct claim to specific underlying assets but nonetheless follow Shariah-compliant principles. The underlying assets and profit-sharing principles of many sukuk can provide a tangible link with the actual economy, which makes them suitable for infrastructure financing and volatility transfer reduction during a crisis (Hassan et al. 2018; Bhuiyan et al. 2019). Danila (2023) found that, though the COVID-19 pandemic caused significant volatility across global financial markets, sukuk demonstrated a relatively stable performance compared with conventional bonds, especially in emerging markets. This study explores whether sukuk can provide a safe haven for Islamic investors during a crisis, such as the COVID-19 pandemic, by leveraging their unique structural advantages, such as asset-backing and risk-sharing mechanisms (Naeem et al. 2021).

In the context of this study, Islamic investors are those who are restricted to Shariah-compliant assets, such as sukuk and Islamic stocks. Unlike conventional investors, who can freely invest in any asset class, Islamic investors must adhere to strict guidelines that prohibit investment in interest-bearing instruments (*riba*) and industries considered to be unethical (e.g. alcohol and gambling; Md Husin et al. 2024). Such restrictions are rooted in the principles of *maqasid al-Shariah*, particularly, *hifz al-maal* (protection of wealth), which emphasises the ethical management and preservation of wealth in accordance with Shariah. Thus, Islamic investors have fewer options compared with regular investors during a crisis, which can influence their investment behaviour. The risk-sharing structure and stability of sukuk align with the *maqasid al-Shariah* principles, which makes them an attractive option, especially during times of heightened uncertainty (Naeem et al. 2023; Danila 2023). Therefore, Islamic investors may exhibit different behaviours compared with conventional investors, as they seek compliance with religious principles and financial security through instruments such as sukuk, rather than conventional bonds (Naifar 2023). The literature reveals several key findings on flight to quality and diversification during the COVID-19 pandemic. For instance, Narayan (2021) highlighted the significant impact of the pandemic on financial markets and noted that investors have increasingly sought safe havens. Yarovaya et al. (2020) found that sukuk acted as a safe haven during the COVID-19 pandemic and demonstrated their relative stability compared with conventional stocks. Similarly, Naeem et al. (2021) observed that the connectedness of global sukuk in regional financial systems increased during the crisis, which indicates their potential role in portfolio diversification and risk management. In addition, Papadamou (2020) discovered that, despite the initial episodes of positive flight to quality from stocks to bonds, the positive behaviour became negative as the pandemic progressed, which reflects the dynamic nature of investor behaviour during extreme market conditions. Furthermore, studies on Islamic stocks suggested that they exhibit unique behaviour during a crisis. For instance, Islamic stocks, which adhere to Shariah principles, have shown different risk-return profiles compared with conventional stocks and can potentially offer additional diversification benefits (Akhtar et al. 2017; Balcilar et al. 2016).

Despite the increasing volume of research on the effects of COVID-19 on financial markets, studies that examined flight to quality from Islamic stocks to sukuk are relatively scarce. Previous investigations underscored Islamic asset performance during the 2008 global financial crisis (GFC), and much of the recent research focused primarily on conventional assets, which have created a knowledge gap in understanding the dynamics of Shariah-compliant investments during times of crisis (Yarovaya et al. 2020; Naeem et al. 2021). This study aims to address this gap by analysing the correlations between Islamic investments, such as sukuk and Islamic stocks, compared with conventional stocks and bonds.

Specifically, this study aims to (1) determine whether Islamic investors benefit from moving their investment from Islamic stocks to sukuk during a crisis, (2) compare the flight-to-quality behaviour of Islamic investors with that of conventional investors, (3) examine whether sukuk can provide diversification benefits to Islamic investors (who are restricted to Shariah-compliant assets) and (4) assess the risk management benefits of sukuk. By addressing the gaps, this study offers valuable insights for Islamic and conventional investors to improve their ability to make informed strategic investment decisions during periods of crisis to maximise returns and minimise risks.

The initial findings of this study indicate that during the early months of the pandemic, considerable flight to quality from Islamic stocks to sukuk occurred. The dynamic conditional correlation (DCC) analysis shows that sukuk provided a relative safe haven compared with Islamic stocks, which aligns with the theoretical expectations of risk diversification. However, as the market decline persisted, the correlation between sukuk and Islamic stocks became positive, which suggests that the benefits of switching to sukuk will be limited over an extended period of market stress. The findings imply that, though sukuk can offer short-term protection during initial market shocks, their effectiveness as a safe haven will diminish during a prolonged crisis. This nuanced understanding is crucial for Islamic and conventional investors in strategising their portfolio allocations during periods of heightened market volatility.

This study conducts DCC MGARCH analysis, which was chosen for its ability to capture time-varying correlations between multiple financial assets. The method's ability to model time-varying correlations can help us understand the risk management benefits and portfolio diversification role of different financial instruments under extreme market conditions (Ji et al. 2022). The COVID-19 pandemic period, which serves as an exogenous shock with direct economic repercussions, was selected owing to its significant and unique impact on global financial markets. The pandemic period contrasts with the GFC, which was driven by internal financial system weaknesses (Roy & Kemme 2020). The sample consists of 367 daily observations from January 2020 to May 2021, collected from Bloomberg and the Standard and Poor (S&P) Dow Jones Indices website.

## LITERATURE REVIEW

### UNDERLYING THEORIES

This study is anchored in modern portfolio theory (MPT), developed by Markowitz (1952), which emphasises the importance of portfolio risk diversification between different assets. Specifically, MPT suggests that low-risk investments, such as bonds or sukuk, should be combined with high-risk investments, such as stocks, to achieve maximum portfolio returns at optimised risk levels. The diversification benefits proposed by MPT are crucial for understanding the flight-to-quality phenomenon observed during the COVID-19 pandemic, in which investors sought to rebalance their portfolios by moving away from risky Islamic stocks towards safe sukuk.

Another relevant theory is mean reversion theory, which was proposed by De Bondt and Thaler (1985). The theory posits that asset prices will eventually return to their mean level after reaching an extreme point owing to a crisis or bad news. The application of the theory in the context of the COVID-19 pandemic can help determine whether Islamic stocks and sukuk overreacted to the initial market shock and whether their prices reverted to their previous mean level over time.

Behavioural finance theories also play a significant role in understanding the findings of this study. The flight-to-quality phenomenon, in which investors shift from risky assets to safe ones during periods of uncertainty, is deeply rooted in behavioural finance. Theories such as the ostrich effect (Galai & Sade 2006; Karlsson et al. 2009), which describes investors' tendency to avoid negative financial information, and the impact of investor sentiment on asset correlations (Andersson et al. 2008) can provide insights into the psychological factors that drove investors' behaviour during the pandemic. The theories can help explain why investors moved from Islamic stocks to sukuk in response to the heightened market volatility and uncertainty.

In summary, flight to quality occurs when investors shift their capital from risky assets, such as stocks, to safe assets, such as bonds, gold or sukuk, during periods of heightened uncertainty or financial crisis. Such behaviour is driven by investors' desire to preserve their capital and reduce their exposure to volatility. Theoretical foundations such as MPT (Markowitz 1952) emphasise the importance of diversifying between risky and safe assets to optimise returns at low risk. In addition, behavioural finance theories, such as the ostrich effect (Galai & Sade 2006) and herding behaviour (Bikhchandani & Sharma 2000), can explain why investors collectively flee to safe investments during market downturns. Flight to quality is typically observed through changes in asset correlations, in which a negative correlation can be seen between risky and safe assets (Naeem et al. 2023; Danila 2023).

The principles of *maqasid al-Shariah* can provide a unique lens through which to analyse the study's findings. *Maqasid al-Shariah*, or the objectives of Islamic law, emphasise ethical investment, risk sharing and the prohibition of *riba* (interest). Sukuk, or Islamic bonds, can be structured in various ways, including asset backed and asset based or through profit-sharing and profit-and-loss-sharing models. Although some sukuk are asset backed, which can promote risk sharing between issuers and investors (Bhuiyan et al. 2020), others may not have a direct claim to specific underlying assets but nonetheless follow Shariah-compliant principles. Ethical considerations in Islamic finance, which are rooted in *maqasid al-Shariah*, aim to create a stable and equitable financial system, which can offer resilience during a financial crisis (Hambali & Adhariani 2023; Musari & Hidayat 2023). This study determines whether sukuk can provide a safe haven for

Islamic investors during a crisis, such as the COVID-19 pandemic, by leveraging their unique structural advantages and adherence to Islamic finance principles. The appeal of sukuk lies in their alignment with the *hifz al-maal* (protection of wealth) principle of *maqasid al-Shariah*, which emphasises preserving and using wealth ethically, avoiding interest (*riba*) and engaging in risk sharing, rather than risk transfer. The shift from risky assets, such as Shariah-compliant stocks, to stable instruments, such as sukuk, reflects the application of *hifz al-maal*, as Islamic investors seek the protection and sustainability of their wealth in compliance with Shariah (Abdurroziq et al. 2022). The shift is significant in the context of a financial crisis, in which sukuk can provide a resilient option with low volatility (Naeem et al. 2023; Danila 2023).

#### IMPACT OF COVID-19 ON CAPITAL MARKETS

The COVID-19 pandemic had a catastrophic impact on people's livelihood and the global economy (Arellano et al. 2020; Goodell 2020). The anxiety, uncertainty and high fatality rates caused by the pandemic led to substantial interest from researchers on the crisis (Goodell 2020). Narayan (2021) analysed 138 publications on the impact of COVID-19 on business and economics and found that financial markets, COVID-19 policies and energy markets are the most examined areas, particularly, the equity market. Narayan (2021) determined that most of the studies focused on financial markets owing to the availability of daily secondary data, such as stock prices, indices and spot and futures prices. Research examined the pandemic's influence on stock markets (Salisu et al. 2020), mutual funds (Mirza et al. 2020), commodities (Gharib et al. 2020) and cryptocurrencies (Goodell & Goutte 2021), with some paying attention to the bond market (Papadamou 2020). However, a notable gap exists in research on flight to quality from Islamic stocks to sukuk during the COVID-19 pandemic.

During a crisis, investors typically prefer the safety of government bonds, which can trigger flight to quality, in which portfolios are rebalanced towards safe assets (Caballero & Krishnamurthy 2008). Most flight-to-quality events are country specific, rather than global (Baele et al. 2020). The COVID-19 pandemic is a clear example of a global event marked by high turbulence and uncertainty. Flight to quality is driven by investors' risk aversion and the need to preserve capital during periods of heightened market volatility. The behaviour has been observed in various market segments, including for government bonds, gold and other safe-haven assets. For instance, during the initial phase of the pandemic, considerable inflow into US Treasuries occurred, which caused yields to plummet (Correa et al. 2020). Similarly, demand for gold surged, because it is traditionally viewed as a safe store of value during uncertain times (Baur & McDermott 2010; Shahzad et al. 2019). In addition to traditional safe-haven assets, corporate bonds have seen increased demand during periods of market stress. During the COVID-19 pandemic, a noticeable shift was seen from equities to high-quality treasury bonds, which reflects investors' search for safe investment opportunities (Cai et al. 2023). The shift was further supported by central bank interventions, such as the Federal Reserve's bond-buying programmes, which aim to stabilise financial markets and provide liquidity (Fleming et al. 2022).

Furthermore, Papadamou (2020) found that episodes of positive flight to quality from stocks to bonds became negative during the COVID-19 crisis in 10 countries across Europe, Asia, the United States and Australia. Paule-Vianez et al. (2021) discovered that increased COVID-19-induced fear led to changes in sovereign bond yields in G7 countries. Andries et al. (2021) concluded that rising infection rates and quarantine measures increased uncertainty and led to high sovereign risk premiums. The COVID-19 factor can also explain investor behaviour in low-risk markets, such as Germany, and financial markets penalised sovereigns with limited fiscal capacity (Augustin et al. 2021). Izadin et al. (2025) also observed that during the COVID-19 pandemic, Malaysian government bonds exhibited equity-like characteristics, diverging from their traditional safe-haven role due to shifts in investor sentiment. Flight-to-quality behaviour is not limited to the COVID-19 pandemic and was also observed during previous financial crises. For example, during the 2008 GFC, significant movement of capital from equities to bonds and other low-risk assets was observed (Gorton & Metrick 2012). Such behaviour underscores the importance of understanding investors' sentiment and risk perception during times of crisis, because such factors play a crucial role in shaping market dynamics.

Investors' sentiment can significantly impact the link between stocks and bonds during a crisis (Andersson et al. 2008). Behavioural finance studies identified several psychological factors that can influence investor behaviour during a crisis. The ostrich effect describes investors' tendency to avoid negative financial information, which can lead to delayed reactions to market downturns (Galai & Sade 2006; Karlsson et al. 2009). Information overload can overwhelm investors and cause them to make suboptimal decisions or avoid trading (Agnew & Szykman 2005). In addition, poor past experiences, such as substantial financial losses, can result in heightened risk aversion and prompt investors to seek safe assets (Thaler & Johnson 1990). During the COVID-19 pandemic, such behavioural factors played a crucial role in driving flight-to-quality behaviour. Faced with unprecedented uncertainty and volatile markets, investors exhibited risk-averse behaviour and shifted their portfolios from equities to bonds and other safe-haven assets (Aslanidis et al. 2020). Papadamou (2020) emphasised that the heightened anxiety and fear caused by the pandemic led to increased demand for government bonds, which reinforced the flight-to-quality trend. Moreover, the media's constant coverage of the pandemic and its economic repercussions further amplified investors' fear and uncertainty and exacerbated their risk-averse behaviour (Smales 2021).

Behavioural finance theories suggest that investors' herding behaviour can intensify flight-to-quality movements. Meanwhile, herding occurs when investors follow the actions of others, rather than relying on their own analysis, which

can lead to amplified market trends and increased volatility (Bikhchandani & Sharma 2000). During the COVID-19 pandemic, herding behaviour was evident, as investors collectively moved towards safe assets, further driving down yields on government bonds and increasing their prices (Bouri et al. 2021). Understanding such behavioural factors is essential to comprehend the dynamics of financial markets during a crisis and develop strategies to mitigate their impact.

#### ISLAMIC FINANCE IN CAPITAL MARKETS

The Islamic financial sector became highly prominent after the 2008 GFC, as research indicated that it outperforms conventional finance and demonstrates low risk and enhanced stability (Uddin et al. 2020). Islamic finance has seen remarkable growth, expanding from USD 200 billion in 2003 to an anticipated USD 4 trillion in assets by 2030 (Alam & Seifzadeh 2020). Such growth has been driven by the adoption of Islamic financial principles in Muslim and non-Muslim countries (Alam 2019). Islamic finance is grounded in Shariah principles, which prohibit *riba* (interest) and emphasise asset-backed and equity-based financing. Sukuk, or Islamic bonds, can protect investors by tying returns to the performance of underlying assets, which can promote risk sharing between issuers and subscribers (Bhuiyan et al. 2020). The structure makes sukuk well suited for infrastructure financing and can reduce volatility during a crisis. Over the past few decades, the stability and ethical foundation of Islamic finance have attracted a diverse range of investors, which has led to its expansion across different regions and financial markets.

Islamic finance extends beyond mere financial transactions and aims to fulfil wide socioeconomic objectives, as outlined by *maqasid al-Shariah* (the goals of Islamic law). Such objectives encompass the safeguarding of faith, life, intellect, progeny and wealth (Abdurroziq et al. 2022). By promoting risk sharing and linking returns with tangible assets, sukuk align with the aforementioned objectives and can provide a stable and ethical investment framework. Sukuk contracts can have different structures, depending on the nature of the business contracts (*mudrabah* or *musharakah*) or the characteristics of the underlying assets (*ijarah*). Such diversification in sukuk structures allows for flexibility and adaptation to various financial needs and market conditions, which can enhance their appeal as a financial instrument. Furthermore, Islamic stocks must adhere to Shariah principles, which can ensure ethical practices and align with the moral values of Islamic investors (Md Husin et al. 2024).

Islamic financial instruments, such as sukuk, can offer significant diversification benefits and lower volatility compared with their conventional counterparts during a financial crisis (Akhtar et al. 2017). Balcilar et al. (2016) observed that the correlation between sukuk and bond markets strengthens in times of financial distress. Sukuk can achieve lower volatility and higher returns compared with conventional bonds in regions like the United States and Europe (Hassan et al. 2018). In addition, Kenourgios et al. (2016) found that Islamic equity and bond indices do not significantly comove with their conventional counterparts, which suggests that Islamic securities can serve as effective hedging instruments during market turmoil. Furthermore, Balcilar et al. (2016) highlighted that Islamic bonds offer distinct diversification advantages over conventional bonds because of their unique response to global market shocks. The insights underscore the potential of Islamic financial instruments to enhance portfolio diversification and provide stability during economic uncertainties, which can make them appealing options for Islamic and conventional investors.

Despite the obvious benefits of sukuk, some studies found no significant difference between sukuk and traditional bonds, thereby casting doubt on sukuk's financial innovation. Aloui et al. (2015) explored correlations among Islamic stocks and sukuk in GCC countries and concluded that Islamic assets exhibit comparable correlations with those of conventional stocks and bonds. Umar (2017) and Mansor et al. (2011) observed minimal differences between Islamic and conventional performance and suggested that attempts to replicate conventional investment results may undermine the principles of Islamic finance. Naifar et al. (2017) contended that sukuk and conventional bonds are not merely alternatives, and their combined use can enhance portfolio stability and performance. Meanwhile, Bhuiyan et al. (2020) found that incorporating a sukuk index in a traditional bond portfolio could reduce risks. The mixed findings indicate the need to conduct comprehensive research to comprehend the nuanced differences and potential synergies between Islamic and conventional financial instruments.

However, the recent crisis reemphasised the importance of Islamic stocks and sukuk as key instruments for managing risk during financial turmoil. Naeem et al. (2023) highlighted that sukuk have strong hedge and safe-haven properties and provided stability and diversification for investors during the COVID-19 pandemic. Similarly, Danila (2023) found that sukuk exhibit lower volatility compared with conventional bonds, which makes them an appealing option for risk-averse investors in emerging markets. Meanwhile, Arif et al. (2021) demonstrated that Islamic stocks can serve as a robust safe haven for G7 markets and offered better protection during the COVID-19 pandemic than during the 2008 GFC. Both asset classes have proven to be resilient, which underlines their crucial role in portfolio diversification during a global crisis.

Despite the increasing volume of research on the effects of COVID-19 on financial markets, studies that examined flight to quality from Islamic stocks to sukuk are relatively scarce. Previous investigations underscored Islamic asset performance during the 2008 GFC, and much of the recent research focused primarily on conventional assets, which have created a knowledge gap in understanding the dynamics of Shariah-compliant investments during times of crisis (Yarovaya et al. 2020; Naeem et al. 2021). Alahouel and Loukil (2022) found no evidence of flight to quality from Islamic stocks to sukuk, because the correlation between the two remains positive, particularly, over short investment horizons. This finding suggests a close relationship between the assets during financial uncertainty and challenges the traditional view of flight-

to-quality behaviour. By addressing the gap, this study seeks to investigate whether Islamic investors will benefit from shifting from Islamic stocks to sukuk during a crisis and compare the outcomes with those of conventional investors to provide deep insights into the role of sukuk in managing risk and enhancing portfolio diversification during financial disruptions.

TABLE 1. Literature review

Scenario	Supporting References	Supporting References
A: From conventional (stock) to conventional (bond)	Papadamou et al. (2020) - demonstrated a flight-to-quality trend from stocks to bonds across multiple regions during the COVID-19 pandemic Cai et al. (2023) - observed a shift from equities to high-quality treasury bonds during the initial phase of the pandemic	Papadamou et al. (2020) - demonstrated a flight-to-quality trend from stocks to bonds across multiple regions during the COVID-19 pandemic Cai et al. (2023) - observed a shift from equities to high-quality treasury bonds during the initial phase of the pandemic
B: From conventional (stock) to Shariah compliant (stock)	Arif et al. (2021) - found that Islamic stocks acted as a safe haven for G7 stock markets during the COVID-19 pandemic and offered diversification benefits and protected equity investments during the crisis; such benefits highlight the appeal of Shariah-compliant stocks to risk-averse investors seeking stability during volatile periods like the pandemic.	Arif et al. (2021) - found that Islamic stocks acted as a safe haven for G7 stock markets during the COVID-19 pandemic and offered diversification benefits and protected equity investments during the crisis; such benefits highlight the appeal of Shariah-compliant stocks to risk-averse investors seeking stability during volatile periods like the pandemic.
C: From conventional (stock) to sukuk	Naeem et al. (2023) - found that sukuk provided strong safe-haven and hedge properties for stock markets during the COVID-19 pandemic and offered a low-risk alternative for investors; hedge ratio and effectiveness estimates showed that adding sukuk to a portfolio can provide substantial diversification and risk mitigation benefits, thereby making sukuk an appealing option for risk-averse investors.	Naeem et al. (2023) - found that sukuk provided strong safe-haven and hedge properties for stock markets during the COVID-19 pandemic and offered a low-risk alternative for investors; hedge ratio and effectiveness estimates showed that adding sukuk to a portfolio can provide substantial diversification and risk mitigation benefits, thereby making sukuk an appealing option for risk-averse investors.
D: From conventional (bond) to sukuk	Bhuiyan et al. (2020) - found that incorporating a sukuk index in a traditional bond portfolio could lower risk Danila (2023) - found that sukuk demonstrated lower volatility than conventional bonds during the COVID-19 pandemic; sukuk acted as a safe-haven asset; highlighted the potential for investors to shift from conventional bonds to sukuk as a risk mitigation strategy during economic downturns	Bhuiyan et al. (2020) - found that incorporating a sukuk index in a traditional bond portfolio could lower risk Danila (2023) - found that sukuk demonstrated lower volatility than conventional bonds during the COVID-19 pandemic; sukuk acted as a safe-haven asset; highlighted the potential for investors to shift from conventional bonds to sukuk as a risk mitigation strategy during economic downturns
E: From Shariah compliant (stock) to sukuk	Aloui et al. (2015) - explored correlations between Islamic stocks and sukuk in GCC countries; concluded that Islamic assets exhibit comparable correlations with those of conventional stocks and bonds Alahouel and Loukil (2022) - observed the absence of flight-to-quality behaviour, because correlations are positive, especially at a short investment horizon	Aloui et al. (2015) - explored correlations between Islamic stocks and sukuk in GCC countries; concluded that Islamic assets exhibit comparable correlations with those of conventional stocks and bonds Alahouel and Loukil (2022) - observed the absence of flight-to-quality behaviour, because correlations are positive, especially at a short investment horizon

## DATA AND METHODOLOGY

### DATA

This study conducted DCC analysis by using the daily global sukuk index, global bond index, global stock index, global Islamic stock index and global gold price. All the data were collected from Bloomberg and the S&P Dow Jones Indices website. A sample size of 367 observations from January 2020 to May 2021 was used to represent the performance of Islamic investments, such as sukuk and Islamic stocks, during the COVID-19 pandemic.

This study chose the COVID-19 pandemic to represent a crisis owing to its unique and significant impact on global financial markets, which contrasts sharply with the GFC. Whilst the GFC was driven by internal financial system weaknesses, specifically, excessive debts and risky activities (Roy & Kemme 2020), the COVID-19 pandemic was an exogenous shock with direct economic repercussions. This distinction underscores the relevance of Islamic finance, which emphasises risk sharing and close ties to actual economic sectors and can provide a robust safety net against such external disruptions. During the pandemic, US stocks plummeted by 37% between 12 February and 23 March 2020, which led to multiple trading suspensions on the New York Stock Exchange (Frazier 2021). In addition, VIX soared from 14x to 85x in mid-March 2020 (Ashraf et al. 2020), which marked its second-highest surge since the GFC (Shehzad et al. 2020). Given the factors, the COVID-19 crisis period was chosen as the focal point to examine movement from Islamic stocks to sukuk and assess the financial stability offered by Islamic finance during such turbulent times.

### METHODOLOGY

This study employed the DCC multivariate generalised autoregressive conditional heteroskedasticity (MGARCH) model to analyse the dynamic relationships between conventional and Islamic stocks, sukuk, bonds and gold during the COVID-19 pandemic. The DCC MGARCH model is well suited for the analysis, because it allows for the examination of time-varying correlations between multiple financial assets and can provide a nuanced understanding of how such correlations evolve over time. Unlike static correlation models, the DCC MGARCH model can capture the dynamic nature of financial markets, which is essential for understanding investor behaviour during periods of economic stress.

The model's ability to capture time-varying correlations is crucial for observing flight-to-quality behaviour, in which investors shift from risky assets to safe ones during periods of heightened uncertainty. By examining the dynamic correlations between conventional stocks, Islamic stocks, sukuk, bonds and gold, this study identified shifts in investor preferences and detected periods when the correlations between risky assets and safe assets, such as gold or sukuk, increased, which indicates flight-to-quality behaviour (Engle 2002; Tsai 2014). By employing the DCC MGARCH model,

this study can effectively investigate mean reversion properties and assess how correlations between conventional and Islamic financial instruments, as well as gold, change in response to market volatility and external shocks, like the COVID-19 pandemic. The comprehensive approach can provide valuable insights into the diversification benefits and safe-haven properties of the assets and aid investors in making informed decisions during a crisis.

#### DYNAMIC CONDITIONAL CORRELATION MGARCH

The assessment methodology involved two stages. In the first stage, a series of univariate GARCH models was evaluated for each remaining series. In the second stage, standardised residuals from the first step were used to estimate the dynamic correlation parameters, independent of the number of correlated series. The multistage approach offers computational advantages over MGARCH models in terms of the number of parameters (Engle 2002). The model extends the constant conditional correlation GARCH model. The model is structured, assuming that the returns of  $N$  assets are conditionally normally distributed, as follows:

$$r_t | I_{t-1} \sim N(0, D_t R_t D_t), \quad (1)$$

where  $D_t$  is the diagonal matrix of standard deviations from univariate GARCH models, and  $R_t$  is the dynamic correlation matrix. The DCC MGARCH model is defined by the following equations:

$$Q_t = (1 - \alpha - \beta)Q + \alpha u_{t-1} u_{t-1}^T + \beta Q_{t-1}, \quad (2)$$

$$R_t = \text{diag}(Q_t)^{-1/2} Q_t \text{diag}(Q_t)^{-1/2}, \quad (3)$$

where

- $Q_t$  is a positive semidefinite matrix,
- $R_t$  is the unconditional variance matrix of  $u_i$ ,
- $u_i \sim N(0, R)$  are the standardised residuals from the GARCH models,
- $\alpha > 0, \beta > 0$  and the model is mean reverting under condition that  $\alpha + \beta < 1$ .

In practice, the model can accurately approximate time-varying correlations, even for large covariance matrices. In addition, the original correlations will remain unchanged when new variables are introduced into the system (Engle, 2002).

#### RESULTS

DCC MGARCH analysis was conducted to identify the dynamic comovement of the variables and examine the limitations of Islamic investors owing to their option restriction for Shariah-compliant assets during a crisis.

TABLE 2. Descriptive analysis and unit root test

	GSUKUK	GBOND	IGSTOCK	GSTOCK	LOGGOLD	VIX
Mean	108.0021	247.0056	201.3271	288.8626	7.4821	26.8518
Median	108.9129	249.4211	200.7800	283.3000	7.4870	24.4600
Maximum	110.4235	258.3050	244.8700	353.4300	7.6322	82.6900
Minimum	100.6099	226.7503	128.5800	187.3300	7.2939	12.1000
Std. Dev.	2.3445	6.9833	28.4909	39.6387	0.0706	11.1209
Skewness	-1.3819	-0.5161	-0.2744	-0.1700	-0.4509	2.1023
Kurtosis	4.2283	2.2054	2.1776	2.2611	2.4468	8.8760
Jarque-Bera test	139.8723***	25.95003***	14.94729***	10.11702***	17.11317***	798.3239***
Min/Mean	-6.84%	-8.20%	-36.13%	-35.15%	-2.52%	-54.94%
Min/Max	-8.89%	-12.22%	-47.49%	-47.00%	-4.43%	-85.37%
ADF	-7.16113***	-13.4327***	-11.7437***	-10.9749***	-17.9214***	-9.43054***

\*\*\* significance level < 1%

Table 2 shows the characteristic and summary statistics of the variables used in this study. The observations show that global Islamic and conventional stocks suffered significantly during the pandemic period, with minimum and average returns at -36.13% and -35.15%, respectively. Although the performance of bonds and sukuk suffered (-6.84% and -8.20%, respectively), their returns were much less affected compared with those of Islamic and conventional stocks. The result supports flight-to-quality theory, which states that investors exit the stock market during a crisis to protect their investment in safe assets, such as bonds and sukuk. In addition, the relatively satisfactory performance of gold, with a minimum-to-mean return of -2.52%, highlights its role as a safe-haven asset during the pandemic. However, investors may also move to cash or cash equivalents or diversify into other safe-haven assets, such as treasury securities or certain currencies (Baur & McDermott 2010; Shahzad et al. 2019; Gorton & Metrick 2012).

Similarly, skewness measures the asymmetry of probability distributions, and the results show that both indices are negatively skewed, which indicates a high probability of decreased returns during the pandemic. This finding is also true for safe assets, such as bonds, sukuk and gold. Furthermore, the standard deviation reveals that conventional stocks are the riskiest, at 39.6387, followed by Islamic stocks, at 28.4909. By contrast, gold and sukuk are less risky, with a standard

deviation of 0.0706 and 2.3445, respectively. Finally, the augmented Dickey–Fuller test results suggest that all the variables in this study are stationary at the first difference, which confirms their suitability for further time-series analysis. The findings underscore the stability of sukuk and gold during periods of financial instability, making them attractive options for risk-averse investors (Yarovaya et al. 2020; Naeem et al. 2021; Bhuiyan et al. 2020). In addition, the broad behaviour reflects a strategic reallocation to minimise exposure to volatile and risky assets during uncertain times (Caballero & Krishnamurthy 2008; Correa et al. 2020).

TABLE 3. General correlation

	GSUKUK	GBOND	IGSTOCK	GSTOCK	LOGGOLD	VIX
GSUKUK	1.000000					
GBOND	0.889647	1.000000				
IGSTOCK	0.806784	0.774080	1.000000			
GSTOCK	0.741983	0.657197	0.978459	1.000000		
LOGGOLD	0.699780	0.851238	0.522625	0.364277	1.000000	
VIX	-0.574525	-0.360871	-0.659952	-0.709062	-0.233127	1.000000

The findings on the general correlation between the various financial instruments reveal several significant insights into their interrelationships during the observed period. The correlation between GSUKUK and GBOND is strong, at 88.96%, which indicates that the two asset classes tend to move in tandem. The strong positive correlation suggests that sukuk and bonds behaved similarly during the pandemic, which may reflect their role as relatively safer investment options compared with stocks. The high correlation between the instruments supports the notion that investors who seek stability may find sukuk and bonds to be effective components of a diversified portfolio during periods of economic uncertainty (Bhuiyan et al. 2020).

By contrast, the correlation between VIX and the other financial instruments is notably negative, particularly, GSUKUK (-57.45%), IGSTOCK (-65.99%) and GSTOCK (-70.91%). VIX, which is often referred to as the ‘fear index’, typically rises during periods of high market volatility and investor uncertainty. The negative correlations indicate that, as market volatility increases, the returns on such asset classes decrease. An inverse relationship is expected, because high VIX values reflect considerable market fear and risk aversion, which can prompt investors to move away from risky assets, like stocks, towards safe assets, like sukuk and bonds. The finding aligns with behavioural finance theory, which states that investors exhibit risk-averse behaviour during times of heightened uncertainty (Caballero & Krishnamurthy 2008; Galai & Sade 2006).

Gold (LOGGOLD) also shows interesting correlation patterns, with a strong positive correlation with GBOND (85.12%) and a moderate correlation with GSUKUK (69.98%) and IGSTOCK (52.26%). This finding suggests that gold, which is traditionally viewed as a safe-haven asset, behaved similarly to bonds during the pandemic and offers a refuge for investors during turbulent times. The low, yet positive, correlation of gold with Islamic stocks indicates that though gold can provide a certain level of safety, it is not as closely linked with the performance of Islamic stocks as it is to that of bonds. Overall, the findings highlight the interconnectedness of the different asset classes and underscore the importance of considering various investment options to manage risk and enhance portfolio stability during a crisis. The analysis links with the research objectives of determining the role of sukuk in providing portfolio diversification and assessing the risk management benefits of sukuk during the COVID-19 pandemic (Yarovaya et al. 2020; Naeem et al. 2021).

TABLE 4. Unconditional correlations and volatilities

	GBOND	GSUKUK	GSTOCK	IGSTOCK	GOLD
GBOND	0.0033				
GSUKUK	0.5037	0.0018			
GSTOCK	0.1010	0.2697	0.0155		
IGSTOCK	0.0905	0.2452	0.9786	0.0157	
GOLD	0.4314	0.2019	0.2026	0.2265	0.0147

Table 4 presents the unconditional correlations and volatilities of the various financial instruments and offers insights into their behaviour during the study period. The diagonal elements of the table represent the volatility of each asset class, whereas the off-diagonal elements represent the correlation between pairs of assets. Sukuk (GSUKUK) are the least volatile asset, with a volatility of 0.0018, whereas Islamic stocks (IGSTOCK) and conventional stocks (GSTOCK) exhibit the highest volatility, at 0.0157 and 0.0155, respectively. Conventional bonds (GBOND) also show a low volatility of 0.0033, and gold (LOGGOLD) maintains a low volatility of 0.0147, which reinforces its status as a stable asset. The findings confirm that sukuk have lower risk compared with the other assets, making them a preferable investment during periods of high market uncertainty.

The correlation values reveal the relationships between the different asset classes. Sukuk show a moderate positive correlation with Islamic stocks (24.52%) and conventional stocks (26.97%), which indicates its role in diversification. By contrast, conventional bonds have a high correlation with Islamic stocks (77.41%) and conventional stocks (65.72%), which suggests that they move closely with the stock market. Gold exhibits a moderate correlation with conventional bonds (43.14%) and sukuk (20.19%), which underlines its utility as a diversification tool. In addition, sukuk’s stronger negative correlation with VIX (-57.45%) compared with that with conventional bonds (-36.09%) suggests that sukuk can offer better protection during periods of high market volatility, which positions the asset as a superior safe haven during a crisis.

Although gold also serves as an effective safe haven, with a negative correlation with VIX (-23.31%), sukuk's characteristics during the COVID-19 pandemic highlight their potential as a superior safe haven asset for conventional and Islamic investors. The insights align with the research objective of assessing the risk management benefits of sukuk and their role in providing stability during a financial crisis (Yarovaya et al. 2020; Naeem et al. 2021).

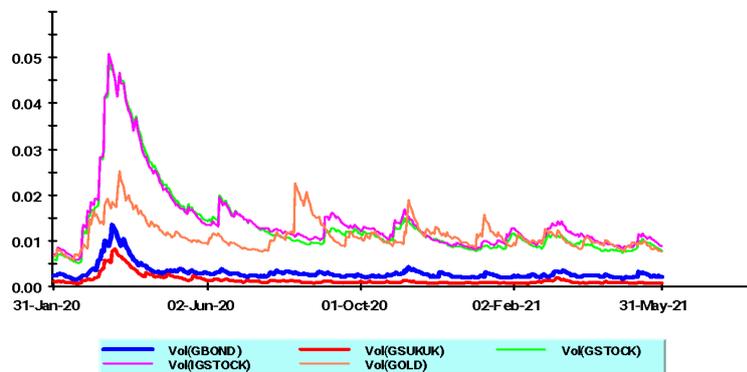


FIGURE 1. Plot of conditional volatilities

Figure 1 illustrates the conditional volatility of the various financial assets over time during the COVID-19 pandemic, namely, conventional bonds (GBOND), global sukuk (GSUKUK), conventional stocks (GSTOCK), Islamic stocks (IGSTOCK) and gold (GOLD). The plot reveals a significant spike in volatility for all the assets around mid-March 2020, which coincides with the start of the COVID-19 pandemic. The period caused widespread market panic and uncertainty, as fear of the economic impact of lockdowns, supply chain disruptions and a sudden halt in economic activities led to sharp declines in global financial markets. Conventional bonds and sukuk show a slight increase in volatility but remain relatively stable compared with the other assets. Specifically, the volatility of sukuk stabilised quickly, which underscores their effectiveness as a low-risk investment during a crisis (Yarovaya et al. 2020). The low volatility of bonds and sukuk during this peak period highlights their role as safe-haven assets that can provide stability when other markets are highly volatile. The behaviour aligns with flight to quality, in which investors move their capital from risky assets to safe ones during periods of financial uncertainty (Caballero & Krishnamurthy 2008).

By contrast, conventional and Islamic stocks exhibit the highest volatility during the early pandemic period, with a significant spike in mid-March 2020. The sharp increase reflects the severe market uncertainty and investor panic, which led to massive sell-offs in stock markets worldwide. Gold also experienced a spike in its volatility at the start of the pandemic, which reflects its role as a safe-haven asset, though its volatility remained moderate compared with that of stocks. Despite the initial increase, gold demonstrates relative stability, which highlights its utility in risk diversification (Naeem et al. 2021). The distinct reactions of the asset classes underscore the importance of sukuk and bonds as stable investment options during a crisis, whereas gold serves as an effective diversification tool. The findings align with the research objective of assessing the risk management benefits of sukuk and their role in providing stability during a financial crisis (Yarovaya et al. 2020; Naeem et al. 2021).

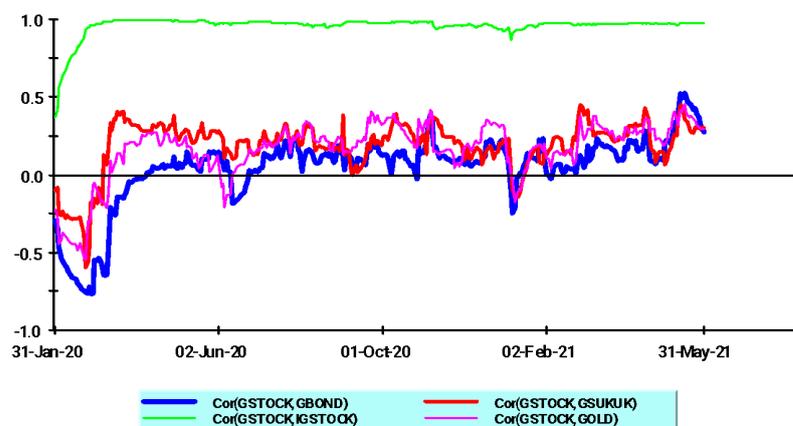


FIGURE 2. Plot of conditional correlations (GSTOCK)

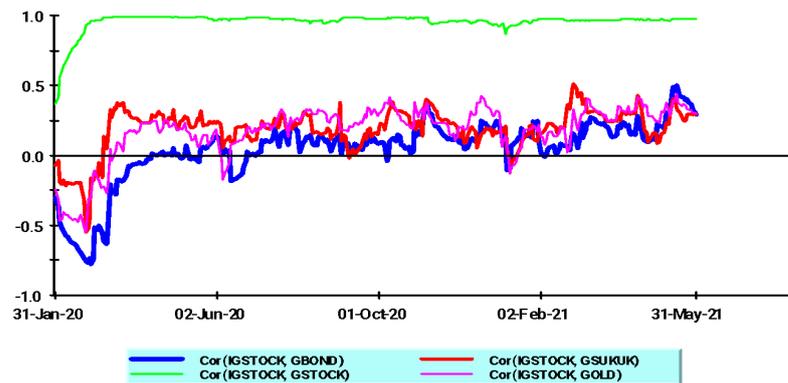


FIGURE 3. Plot of conditional correlations (IGSTOCK)

Figures 2 and 3 offer a detailed analysis of the conditional correlation of conventional stocks (GSTOCK) and Islamic stocks (IGSTOCK) with conventional bonds (GBOND), global sukuk (GSUKUK) and gold (GOLD) over the course of the COVID-19 pandemic. The plots provide a visual representation of how the asset classes interacted under extreme stress and the subsequent recovery of financial markets during the pandemic period. The data highlight the dynamic shifts in investor behaviour and market relationships in response to the unfolding crisis.

Figure 2 shows the conditional correlation of GSTOCK with GBOND, GSUKUK and GOLD. At the start of the pandemic, around mid-March 2020, the correlation between GSTOCK and GBOND was negative. The negative correlation is indicative of flight-to-quality behaviour, in which investors move their capital from risky assets, such as stocks, to safe assets, such as bonds, during periods of high uncertainty to preserve their capital (Caballero & Krishnamurthy 2008). As the pandemic progressed and markets began to stabilise, the correlation became positive, which suggests a return to typical market dynamics, in which stocks and bonds move in sync as investor confidence is restored. The correlation between GSTOCK and GSUKUK remained generally positive throughout the period, with some fluctuations, which indicates that sukuk can provide diversification benefits but also tend to move in the same direction as conventional stocks, particularly, during recovery phases. Meanwhile, the correlation between GSTOCK and GOLD was relatively stable and positive but lower compared with GSUKUK, which suggests that gold can offer moderate diversification benefits but maintain some degree of synchronisation with stock market movements during certain periods (Baur & Lucey 2010).

Figure 3 depicts the conditional correlation of IGSTOCK with GBOND, GSUKUK and GOLD and showcases a pattern similar to that observed for GSTOCK. At the beginning of the pandemic, the correlation between IGSTOCK and GBOND was negative, which reflects flight-to-quality behaviour, as investors seek safety in bonds amid market turmoil. As the crisis stabilised, the correlation became positive, which indicates a normalisation in market behaviour and the reestablishment of typical investment dynamics. The correlation between IGSTOCK and GSUKUK remained positive and relatively stable, with occasional fluctuations, which suggests that Islamic stocks and sukuk generally move together, especially during stable market conditions. However, the positive correlation also implies that whilst sukuk can provide some diversification, they remain somewhat linked with the performance of Islamic stocks. Towards the end of the period, the correlation between the assets showed minor increases, which reflects a close relationship as market conditions improve.

The correlation between IGSTOCK and GOLD in Figure 3 mirrors the pattern seen in GSTOCK and GOLD. The positive and relatively stable correlation suggests that gold can consistently provide moderate diversification benefits for Islamic stock investors. Although the correlation is lower than that between stocks and bonds, it highlights gold's unique position as a safe-haven asset that can maintain a degree of independence from stock market movements, especially during periods of financial crisis. This characteristic of gold underscores its role in risk diversification and stability, making it a valuable component of a diversified investment portfolio (Naeem et al. 2021). The distinct reactions of the asset classes during the pandemic period can provide crucial insights into their behaviour under stress and highlight the importance of considering a mix of asset classes to manage risk and enhance portfolio stability.

Overall, the analysis in Figures 2 and 3 emphasises the dynamic and evolving relationships between conventional and Islamic stocks and bonds, sukuk and gold during the COVID-19 pandemic. The initial negative correlation with bonds underscores flight-to-quality behaviour, in which investors seek refuge in safe assets during periods of heightened uncertainty. As market conditions stabilise, the correlation becomes positive, which indicates a normalisation of investment behaviours and a return to typical market dynamics. Sukuk demonstrate a positive correlation with conventional and Islamic stocks, which suggests that they move somewhat in tandem with the assets but offer diversification benefits owing to their low volatility. Gold maintains a moderate and positive correlation with stocks, which reinforces its role as a safe-haven asset and in providing stability and risk diversification during financial turmoil. The findings align with the research objective of assessing the risk management benefits of sukuk and their role in providing stability and diversification during a financial crisis. The insights from the correlations support the notion that sukuk and bonds are reliable safe-haven assets, and gold remains a valuable tool for diversification (Yarovaya et al. 2020; Naeem et al. 2021).

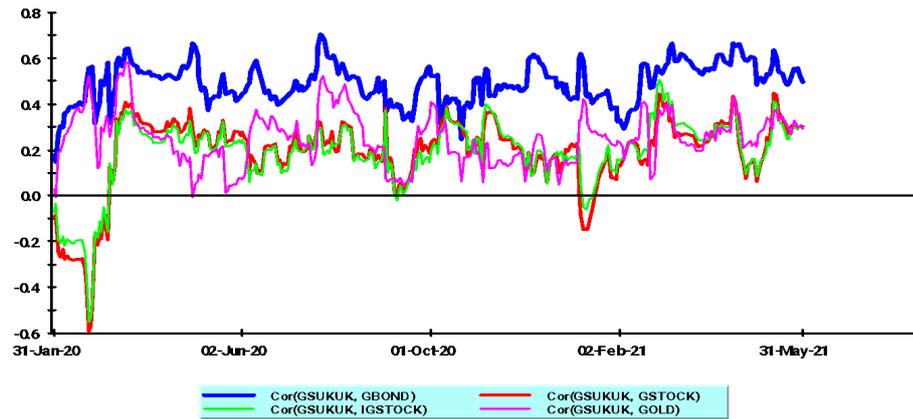


FIGURE 4. Plot of conditional correlations (GSUKUK)

Figure 4 illustrates the conditional correlation of global sukuk (GSUKUK) with conventional bonds (GBOND), Islamic stocks (IGSTOCK), conventional stocks (GSTOCK) and gold (GOLD) over time during the COVID-19 pandemic. The plot provides insights into how sukuk interacted with the other asset classes under the stress of the pandemic and the subsequent recovery.

At the start of the pandemic, around mid-March 2020, the correlation between GSUKUK and GBOND was positive and relatively high. The positive correlation suggests that sukuk and conventional bonds moved together as investors sought safe assets amid the market turmoil. The high correlation reflects flight-to-quality behaviour, in which investors move away from risky assets, such as stocks, towards safe assets, such as sukuk and bonds, to preserve their capital. Over time, the correlation remained strong, which indicates that sukuk and bonds continue to be seen as stable low-risk investments during periods of market instability. The finding aligns with the broad understanding of sukuk as an effective low-risk asset that behaves similarly to conventional bonds in times of financial uncertainty.

The correlation between GSUKUK and the other asset classes, namely, Islamic stocks (IGSTOCK), conventional stocks (GSTOCK) and gold (GOLD), exhibits considerable variability over the observed period. The correlation between GSUKUK and IGSTOCK remained generally positive but fluctuated, which suggests that, though sukuk can offer some diversification benefits, they are somewhat linked with the performance of Islamic stocks. The correlation with GSTOCK is also positive but shows considerable fluctuation, which indicates that sukuk can provide diversification benefits but may occasionally move in tandem with conventional stocks. The correlation between GSUKUK and GOLD is generally low but stable, which highlights the role of gold as an independent safe-haven asset that does not move closely with sukuk. The findings underscore the importance of sukuk in providing diversification and risk management benefits, particularly during periods of market instability, whilst highlighting the complementary role of gold in a diversified portfolio. The analysis supports the research objective of assessing the risk management benefits of sukuk and their role in providing stability during a financial crisis (Yarovaya et al. 2020; Naem et al. 2021).

In conclusion, from the perspective of Islamic investors, the findings suggest that they were not necessarily worse off during the crisis. Although the initial benefit of moving to sukuk is evident owing to their low volatility and stability, the prolonged market impact eventually led to their positive comovement with Islamic stocks, which reduced their diversification benefits. The analysis highlights flight-to-quality behaviour, in which investors moved their capital from risky Islamic and conventional stocks to safe assets, such as sukuk and bonds, during the early stages of the pandemic. The behaviour is reflected in the negative correlations between stocks and bonds, which became positive as markets stabilised. Nonetheless, the fast mean reversion properties of sukuk and their overall low volatility make them a valuable component of a diversified portfolio. Islamic and conventional investors should include sukuk to maximise their risk-adjusted returns, as suggested by MPT. Gold also demonstrates its utility as a safe-haven asset that can provide moderate diversification benefits. The findings underscore the importance of a diversified investment strategy, particularly during financial instability, to mitigate risks and enhance portfolio stability (Yarovaya et al. 2020; Naem et al. 2021).

## DISCUSSION

The primary objective of this study is to investigate flight-to-quality behaviour from Islamic stocks to sukuk during the COVID-19 pandemic to fill a significant gap in the literature. Previous research extensively explored the performance of Islamic financial instruments during the 2008 financial crisis, but focus on their behaviour during the pandemic is limited. This study aims to fill the gap by examining the correlations between Islamic investments, such as sukuk and Islamic stocks, and their conventional counterparts, such as conventional stocks and bonds. Specifically, this study aims to (1) determine whether Islamic investors benefit from moving their investment from Islamic stocks to sukuk during a crisis (by comparing the behaviour of assets during a crisis), (2) compare the flight-to-quality behaviour of Islamic investors with that of conventional investors (by observing the correlations between high- and low-risk assets), (3) examine whether sukuk

can provide portfolio diversification to Islamic investors (who are restricted to Shariah-compliant assets; a negative or low positive correlation indicates diversification benefits) and (4) assess the risk management benefits of sukuk (by discussing the reaction of assets during a crisis).

The findings of this study confirm that Islamic investors will benefit significantly from moving their investment from Islamic stocks to sukuk during a crisis. The DCC MGARCH analysis reveals that, during the COVID-19 pandemic, a marked increase can be seen in the correlation between Islamic stocks and sukuk, which indicates flight-to-quality behaviour. This movement towards sukuk, which are characterised by their low volatility and stable returns, aligns with the *hifz al-maal* (protection of wealth) principle of *maqasid al-Shariah* and highlights their role as a secure investment alternative during turbulent times. The finding is consistent with that of Yarovaya et al. (2020) and Naeem et al. (2021), who noted the stability of sukuk during financial downturns. The behaviour aligns with MPT, which emphasises the importance of diversifying investments to optimise their returns and minimise risks. By shifting to sukuk, investors can effectively balance their portfolios with low-risk assets and thus achieve improved risk-adjusted returns during a crisis.

When comparing the outcomes for Islamic investors with those for conventional investors, this study observes the presence of flight-to-quality behaviour in both groups, though the instrument differs. Conventional investors moved from stocks to conventional bonds and gold, whereas Islamic investors moved to sukuk (Md Husin et al. 2024). The DCC MGARCH model shows that sukuk maintained their low volatility and provided stable returns, akin to conventional bonds. The finding demonstrates that Shariah-compliant investors were not disadvantaged during the crisis and could achieve comparable risk management and return optimisation through sukuk. The observation is supported by Bhuiyan et al. (2020), who highlighted the diversification benefits and reduced value at risk of portfolios that included sukuk. The findings can be further understood through behavioural finance theories, which highlight how psychological factors, such as risk aversion and herd behaviour, can influence investors' decisions during a crisis. The flight-to-quality behaviour seen in Islamic and conventional investors underscores the role of investor sentiment in driving market dynamics during periods of uncertainty.

This study underscores the significant role of sukuk in providing portfolio diversification, particularly during a financial crisis. The DCC MGARCH analysis demonstrates that the correlation between sukuk and the other asset classes, including Islamic stocks, conventional stocks and bonds, is dynamic and shifts over time. During the COVID-19 pandemic, the correlation between sukuk and Islamic stocks increased, which indicates flight-to-quality movement. However, sukuk maintained a relatively low correlation with conventional bonds and stocks, which reinforces their value in a diversified portfolio. By incorporating sukuk, investors can achieve improved risk-adjusted returns and reduce the overall portfolio volatility, especially during periods of economic uncertainty. The finding aligns with that of Balcilar et al. (2016), who observed the strengthening dynamic correlation between sukuk and the bond market during a financial crisis. Mean reversion theory can also be applied, which posits that asset prices will eventually revert to their historical average after periods of extreme volatility. The stable performance of sukuk during the COVID-19 pandemic suggests that such instruments are less likely to deviate significantly from their mean and can provide a stabilising effect within diversified portfolios.

This study clearly demonstrates the risk management benefits of sukuk. The structure of sukuk, which is Shariah compliant and aligns with the *hifz al-maal* principle (protection of wealth) of *maqasid al-Shariah*, can provide inherent stability and reduce exposure to high volatility. Nonprofit-sharing and non-asset-backed sukuk can also play a crucial role in risk management and offer stability and predictable returns. Although *ijarah* (leasing) and *musharakah* (profit-sharing) sukuk are commonly associated with asset backing and equity-based financing, debt-like sukuk, such as *murabaha* (cost plus financing) and *istisna* (project financing) can also provide significant risk mitigation benefits. The different types of sukuk can ensure structured cash flows through fixed payment plans or milestone-based disbursements and reduce exposure to market volatility and uncertain asset valuations. In addition, their contractual nature can reduce default risks, which makes them a safe option for conservative investors, whilst maintaining the principles of Shariah-compliant financing. The DCC MGARCH analysis emphasises that during the COVID-19 crisis, sukuk exhibited lower volatility compared with Islamic and conventional stocks. This stability makes sukuk an effective tool for risk management, because they can offer protection against market downturns and ensure predictable returns. In addition, the consistent performance of sukuk during the crisis period underscores their potential as a reliable safe-haven asset capable of mitigating risks associated with severe market disruptions. This stability and low volatility are supported by the findings of Hassan et al. (2018), who documented the superior risk-return profile of sukuk compared with that of conventional bonds. Furthermore, the principles of *maqasid al-Shariah*, which aim to attain broad socioeconomic goals, including wealth preservation, underpin the stability and ethical foundation of sukuk. The principles can ensure that investments are not only financially viable but also ethically sound and contribute to the overall stability of financial markets during a crisis.

In summary, this study confirms that Islamic investors do not lose out when they shift from Islamic stocks to sukuk during a crisis owing to the low volatility and stable returns of sukuk. Islamic and conventional investors exhibit flight-to-quality behaviour, though Islamic investors prefer sukuk, whereas conventional investors turn to bonds and gold. Sukuk can also enhance portfolio diversification and demonstrate low correlation with conventional assets, which can reduce the overall risk. Furthermore, sukuk can provide effective risk management and offer stability during market downturns and align with the *maqasid al-Shariah* principles of wealth preservation.

## CONCLUSION

The findings of this study can provide valuable insights into the behaviour of Islamic financial instruments during the COVID-19 pandemic and thus contribute to the literature. Islamic investors can benefit from shifting their investment from Islamic stocks to sukuk during a crisis and achieve outcomes comparable to those of conventional investors who turn to traditional bonds. Sukuk have demonstrated their role in portfolio diversification by offering stability and exhibiting low correlation with other assets, which can enhance the overall portfolio performance. The risk management benefits of sukuk are also clear, because they can provide low volatility and stable returns, which makes them a strategic asset for navigating financial turbulence, whilst adhering to Shariah principles. Sukuk's Shariah-compliant structure contributes to their inherent stability and reduced exposure to high volatility. This aligns with the principles of MPT, behavioural finance theories, mean reversion theory and maqasid al-Shariah, which collectively underscore the importance of diversification, psychological factors, mean reversion and ethical investing in financial decision making. This study confirms that sukuk can offer significant risk management and portfolio optimisation advantages and supports their inclusion in Islamic and conventional investment strategies during periods of economic uncertainty.

Furthermore, the implications of the results for different stakeholders should be clarified. From the perspective of Islamic investors, the findings can offer actionable insights into portfolio rebalancing strategies by emphasising the potential of sukuk as a safe haven during periods of volatility (Naem et al. 2023). For policymakers, the results underscore the importance of promoting sukuk as a stable investment vehicle that aligns with Shariah principles, especially in times of economic uncertainty (Danila 2023). Meanwhile, for market analysts, the statistical evidence can inform improved predictions of market behaviour and investor sentiment to enhance decision making during a crisis (Alahouel & Loukil 2022). The insights can fill the gap between the empirical data and practical applications for Islamic investors.

Although this study provides robust evidence on the benefits of sukuk, it has several limitations. Firstly, the analysis was based on a specific time period, that is, the COVID-19 pandemic, which may not capture long-term trends and behaviours. Secondly, this study focused on a limited set of financial instruments and thus may have overlooked other relevant assets that could influence investor behaviour. Thirdly, this study's reliance on secondary data may introduce bias or inaccuracies, which could affect the generalisability of the findings. Finally, the unique nature of the COVID-19 crisis, which is characterised by unprecedented global disruptions, may limit the applicability of the results to other types of financial crises.

This study opens avenues for future research by highlighting the need for a broad and comprehensive examination of Islamic financial instruments across different economic cycles and crises. Future studies should consider long time periods and include a wide range of financial assets to capture comprehensive market dynamics. In addition, investigating the impact of different types of crises, such as geopolitical events or natural disasters, on Islamic finance can provide deep insights into the robustness and adaptability of such instruments. Future research could also explore the behavioural aspects of Islamic finance and examine how investor sentiment and cultural factors can influence investment decisions and market outcomes. The integration of qualitative methods, such as surveys and interviews with investors, can deepen our understanding of the motivations and preferences that can drive flight-to-quality behaviour.

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