



Islamic stocks, conventional stock market, or cryptocurrencies? Looking for a Safe Haven during Covid-19

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Abstract:

This paper investigates the safe haven potential of Islamic stocks within the context of the London stock market, alongside other prominent hedging assets, namely gold, Brent crude, and Bitcoin, using the M-DCC GARCH model. The study finds that Islamic finance no longer demonstrates robust safe haven characteristics but instead serves as a diversifier during periods of market stability. In contrast, gold exhibits notable hedging properties both prior to the COVID-19 pandemic and during market turmoil, outperforming all assets except Bitcoin

Key words: Islamic stocks, safe haven, M-DCC GARCH model, covid-19.

JEL Classification Codes: G11, G15, G17, G21.

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1. Introduction:

The spread of the recent coronavirus 19 pandemic and its social and economic consequences are not completely new, where the world had already witnessed some relatively similar past health crisis, starting with the flu pandemic of (1918-1920), the SARS in 2002-2004, the HINI in 2009, MERS in 2012, Ebola between 2014 and 2015 to the ZIKA 2016 (Ma, Rogers, & Zhou, 2020). Despite the sharp economic downturns resulted due to the spread of these epidemics in the affected countries, covid-19 is considered to be one of the most severe global health crises, where it has and still emerging rapidly across all corners of the world where more than 200 country was affected in a short time (Tenreiro, 2020). Given the current situation, a vast number of governments were obliged to implement urgent containment measures to reduce and control the spread of the virus following varied strategies depending on the severity and lifetime of the pandemic (Ibn-Mohammed et al., 2020), including national lockdown, closing borders, restricting business and social distancing... As a consequence, schools, community centres, non-governmental organizations and many non-essential services and businesses have been obliged to close down (Brodeur, Gray, Islam, & Bhuiyan, 2020; Rahman et al., 2020).

These measures have caused international trade distribution and drove the world's economies and to the deepest recession since 2008 in addition to other financial damages. where (Goodell, 2020) has compared the economic and social costs of the quarantine measures with the high costs of the Global Financial Crisis of 2007-2009 damages (Yarovaya, Elsayed, & Hammoudeh, 2020).

Given the huge impact of the twin crisis worldwide (health and economic crises), the literature on the effect of covid-19 started to grow rapidly, where several studies assessed the diverse economic and financial effects of this pandemic. (Baldwin & Weder di Mauro, 2020; Ibn-Mohammed et al., 2020; Jackson, Weiss, Schwarzenberg, & Nelson, 2020), stated that this pandemic crisis is economically different from a region to another, where unlike previous breakdowns, the G7 (i.e. USA, Korea, Japan, France, Italy, Germany and UK) plus China are the hardest-hit economies. (Kickbusch et al., 2020; McKibbin & Fernando, 2020; Ozili & Arun, 2020) among others discussed the impact of the outbreak of covid-19 on the global economic assessing different restrictive measures which were adopted during this period.

Additionally, the scenario of Covid-19 has bred a severe impact on the financial markets where contrary to previous financial crises, this crisis is considered a "once-in-

a-century” (Gates, 2020). (Albulescu, 2020; Sharif, Aloui, & Yarovaya, 2020; Shehzad, Xiaoxing, & Kazouz, 2020) are among other scholars who studied the behaviour of different developing stock markets such as USA, Japanese and Chinese stock markets during this period whereabout they found that Asian stock markets are less-hit by the outbreak than the American stock market. The financial markets uncertainty has triggered the need to look for a safe haven asset to rebalance the investment portfolios.

In view of the above, this paper will first describe the impact of covid-19 outbreak on different investment assets, and then investigates which of the financial assets is considered as a safe haven during economic instability caused by the pandemic which caused a severe widespread bear market. (Tronzano, 2020) described a “safe haven” as the financial asset that allow investors to rebalance their portfolios, providing hedging benefits during periods of market downturns. These assets must be uncorrelated or negatively correlated during time of market disturbance (Baur & Lucey, 2010; Bouri, Shahzad, Roubaud, Kristoufek, & Lucey, 2020).

Many researchers have identified different safe havens or hedge assets in financial literatures such as precious metals especially gold, oil and agricultural commodities as the soybeans, the exchange rate of the key international currencies such as (EUR/USD, GBP/USD), in addition to the cryptocurrencies including Bitcoin and Tether (Ji, Zhang, & Zhao, 2020). However, to the best of our knowledge, there is unexpectedly a limited empirical literature that carries a safe haven analysis on Islamic stocks during times of recession and financial turmoil. during the last decade, global capital markets have witnessed the introduction and the expansion of Islamic assets, which are considered as ethics-filtered assets. These sharia-compliant assets have not only expanded in Islamic emerging markets but also in conventional capital markets. The Sharia-compliant stocks and Islamic bonds (sukuk) are viewed as innovations in the international financial system since they operate differently from their conventional counterparts. (Hkiri, Hammoudeh, Aloui, & Yarovaya, 2017) This paper fills the literature gap by hypothesising the possibility of treating Islamic Sukuk as a safe haven under the current market conditions during covid-19 crisis, especially after proving it resilience during 2008 global financial crisis.

In order to answer the research question empirically, this study evolves around the performance of the “London stock market” including several financial assets: Gold, Oil Brent, Islamic sukuk presented with MSCI-UK Islamic index and Dow Jones Islamic index, conventional shares FTSE-100 index, MSCI-UK, and Dow Jones-UK index, in

addition to the Bitcoin as a cryptocurrency using daily data that covers the pre-period and the period of covid-19 crisis. We examine the correlation between these assets to identify which one is a safe haven by implementing Multivariate Dynamic Conditional Correlation (M-DCC) GARCH model.

The United Kingdom recorded the sharpest economic recession since the 2008 financial crisis, and as any other country, the British government has adopted different stimulus package and measures to limit covid-19 damages on the health from one side and on the economy in the other side. Even though the lockdown was only announced in later March, a 5.8% GDP decrease was recorded to achieve a 20% during the lockdown period (Leslie & McCurdy, 2020). Those steps did not only effect GDP, but it has also breed a huge impact on the financial market where the FTSE 100 for example has registered the worst plunge since the black Monday in 1987 with 24.8% (Griffith, Levell, & Stroud, 2020; Tahat & Ahmed, 2020).

The rest of our paper is organised as follows: section 2 reviews some of the existing literature on assessing different safe-havens investments, section 03 analyses and describe the data used, section 04 discussed the applied econometric method and its features, section 05 presents the results, finally section 6 concludes.

2. Literature review:

Before discussing the different related literature, the difference between safe haven and safe asset must be pointed. (Baur & Lucey, 2010) was the first who distinguish between these two concepts, a safe asset can be either a diversifier or a hedge in a portfolio that applies in all times, while safe-haven assets are relevant during bearish markets (Baur & McDermott, 2016; Gorton, Lewellen, & Metrick, 2012).

In the words of (Baur & Lucey, 2010) definitions are as follow.

"A diversifier is an asset that is positively correlated (but not perfectly correlated) with another asset or portfolio on average."

"A hedge is an asset that is uncorrelated or negatively correlated with another asset or portfolio on average during normal time."

"A safe haven is defined as an asset that is uncorrelated or negatively correlated with another asset or portfolio in times of market stress or turmoil."

Through our survey of different related literature, we can state several assets which has served as a safe haven during global financial crisis such as gold, oil, agricultural commodities index, cryptocurrencies, international exchange rates, etc.

2.1. Gold as a safe haven:

A large number of scholars have investigated the status of gold as a hedge or/and a safe haven when related to conventional and Islamic stocks, bonds and currency markets.

(Baur & Lucey, 2010) inspect whether gold is a safe haven for US, UK, and German stocks or bonds, results confirms that gold acts as a safe haven for all three stock markets however this is not the case for bonds. (Lucey & Li, 2015) investigate the role of gold with the extension of other precious metals (silver, platinum and palladium) results suggest that gold may not act as a safe haven all times especially when a precious metal can take in the status in an investor portfolio. More recent studies tested the safe haven characteristics of gold crisis against stock markets. (Boubaker, Cunado, Gil-Alana, & Gupta, 2020) argued that gold serves as a strong hedge during bullish market regime, (Triki & Maatoug, 2020) examined the relationship between US stock market and gold, where the results indicate that S&P500 is less correlated with gold in tranquil times while it is strongly correlated during tension, which means that gold can act as a good diversifier but not as a safe haven. These results confirms the findings of (He, O'Connor, & Thijssen, 2018). Another angle of this concept is the examination of gold as a safe haven against currencies, (Joy, 2011; Nguyen, Bedoui, Majdoub, Guesmi, & Chevallier, 2020; Reboredo, 2013) are among others who agreed on the hedging role of gold in a currency portfolio in turmoil and uncertainty periods. In addition, some researches assessed the relationship between gold and Islamic stocks where (Alkhazali & Zoubi, 2020; Chkili, 2017) are one of the few studies that examines the role of gold in providing a safe haven effects for Islamic stock market returns where investors in Islamic indices should include gold in their portfolios.

2.2. Islamic investment as a safe haven:

Islamic investment, known by its features free from the elements of Riba (interest), Gharar (uncertainty), Maysir (speculation) and Haram (unethical), has flourished recently. The growth of Islamic financial markets worldwide has inspired academicians as well as investors to pay more attention to this sector especially after its resistance during the global financial crisis of 2008. The following studies discussed the role of Islamic assets in portfolio diversification and as a safe haven during periods of market disturbance.

Several researchers agreed on the diversification and hedging role of Islamic assets due to its low risk merit such as (Bahloul, Mroua, & Naifar, 2017; Saiti, Bacha, & Masih, 2014; Shamsuddin, 2014) who used different econometric tools to investigate the correlation between Islamic and conventional stocks, to test the safe haven act of Islamic world indices during financial crisis Islamic stocks provide better diversification than conventional stocks. Another study (Akhtar & Jahromi, 2017) explores the effect of the global financial crisis on both Islamic and conventional stock and bond indexes over eleven Islamic and eight non-Islamic countries, the results indicate that Islamic stocks perform as a safe haven especially in UK and US Islamic markets. yet, other results contracted these assumption (Rejeb & Arfaoui, 2019; Shahzad, Aloui, Jammazi, & Shahbaz, 2019) find that Islamic stock and bond markets may not be totally immune to the financial crises.

2.3. Searching for a safe haven during covid-19

A safe haven asset value and particularities are not universal, it differs according to the asset itself, the market studied, and the nature of the market turmoil (Ji, Zhang, & Zhao, 2020). Under this notion, few studies were assessed during covid-19 crisis to explore whether the usual safe haven investments during 2008 crisis are always hedging against covid-19 bearish market.

Cryptocurrencies, a modern digital currency, get the attention of several researchers during covid-19 turmoil. using a standard GARCH (Corbet, Hou, Hu, Larkin, & Oxley, 2020) scrutinise the relationship between the largest cryptocurrencies during covid-19, results suggest that these digital assets serves as a safe haven during this period and provide diversification benefits for investors. Another study by (Conlon, Corbet, & McGee, 2020) used the approach of relative portfolio downside risk to test the safe haven characteristics of three cryptocurrencies; Bitcoin, Ethereum and Tether against a range of international equity indices including: MSCI World; S&P 500 (US); FTSE 100 (UK); FTSE MIB (Italy); IBEX (Spain) and CSI 300 (China). Results reveal that Bitcoin and Ethereum are not a safe haven in the majority of the equity markets, while Tether acted as a safe haven for all indexes examined.

Oil is another investment asset witnessed significant downturn during the novel coronavirus outbreak. (Dutta, Das, Jana, & Vo, 2020) investigates the correlation between oil and gold markets using a DCC GARCH model to examine if gold and/or bitcoin can avail as safe haven asset for international oil markets under the extreme volatile caused

by covid-19, results indicate that that. Bitcoin acts only as a diversifier for crude oil while gold is considered as a safe haven asset for global crude oil markets. A parallel study (Salisu, Vo, & Lawal, 2020) employed VARMA-GARCH model to determine the role of gold as a safe haven or hedge against crude oil. the findings confirm the role of gold as safe haven against oil price risks.

(Samadi, Owjimehr, & Halafi, 2020) applied Wavelet Coherence Analysis to look into the co-movements between stock exchange, foreign exchange, oil, and gold markets, during intense period of uncertainty including covid-19 pandemic in Iran. Main findings favour the role of oil and gold markets as a safe haven where it can be an alternative for risk aversion investors.

Most of the discussed literature examined the relationship between gold/ oil/ Bitcoin Vs stock prices using different econometric approaches; MV approaches with correlation coefficients, efficient frontier, Copula, Markov-Switching or multi-factor regressions. Many also use GARCH models or the mean–variance–skewness approach.

3. Data and methodology:

3.1.Data description:

This study is focused on the London stock market, analyzing eight key stock indices: FTSE 100, DJ-UK, DJ-UK Islamic, MSCI-UK, MSCI-UK Islamic, gold, oil Brent, and bitcoin. The dataset comprises price values expressed in GBP and was collected from reputable sources, primarily the S&P Global Capital IQ database, with the exception of bitcoin, which was obtained from the UK Investing database. The data covers the period from January 1, 2019, to October 3, 2020.

To investigate the impact of the COVID-19 pandemic on the performance of each financial asset, the data was split into two phases: the UK pre-COVID-19 period (January 1, 2019, to March 11, 2020) and the high COVID-19 spread period (March 11, 2020, to October 3, 2020). The aim was to examine the return relationships between these variables and determine the safe-haven characteristics of each asset, particularly within the context of the bear stock market resulting from the prevailing tribulations.

This research provides a rigorous analysis of the London stock market, offering insights into the performance dynamics of various financial assets during the challenging times brought about by the COVID-19 crisis. The findings hold significance for UK

investors seeking to navigate the complexities of the market and make informed decisions amidst ongoing turbulence.

Table 01. descriptive statistics for the pre-period of covid-19 in UK

	DJ_UK	DJ_UK ISLAMIC	FTSE100	GOLD	MSCI_UK	MSCI_UK ISLAMIC	OIL	Bitcoin
Mean	-0.015031	0.004205	-0.013602	0.024782	-0.001889	-0.001013	-0.037162	0.060789
Median	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.157072
Maximum	0.980775	1.592677	0.967261	1.521776	1.950584	1.168905	4.891242	6.338142
Minimum	-3.560961	-2.509570	-3.473769	-2.051953	-2.236593	-3.143941	-7.812051	-21.59651
Std. Dev.	0.353882	0.360018	0.352013	0.292820	0.347558	0.317632	0.812978	2.131846
Skewness	-3.141394	-1.373865	-3.033553	-0.406161	-0.833529	-2.807611	-2.303123	-4.839796
Kurtosis	28.67433	13.19267	27.03682	11.83224	12.77590	27.82539	26.91949	54.13696
Jarque-Bera	12662.94	2019.860	11139.24	1425.865	1782.545	11741.93	10754.65	23136.76
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	-6.538374	1.829127	-5.916797	10.78017	-0.821682	-0.440794	-16.16539	12.46171
Sum Sq. Dev.	54.35078	56.25197	53.77843	37.21262	52.42578	43.78643	286.8450	927.1326
Observations	435	435	435	435	435	435	435	435

Source: Data processing outputs

Table 02. descriptive statistics for the during the period of covid-19 in UK

	DJ_UK	DJ_UK ISLAMIC	FTSE100	GOLD	MSCI_UK	MSCI_UK ISLAMIC	OIL	Bitcoin
Mean	-0.005312	0.034548	0.000921	0.030901	0.010186	0.035784	0.005686	0.073263
Median	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.020514
Maximum	3.685574	3.918440	3.763909	2.508208	3.870613	3.376274	11.20422	6.903870
Minimum	-5.033324	-5.709096	-4.999809	-2.057937	-5.753758	-4.248021	-10.24343	-6.346022
Std. Dev.	0.769667	0.806018	0.770486	0.544235	0.850760	0.689466	2.268846	1.517673
Skewness	-1.068041	-1.507596	-1.038988	0.272760	-1.322068	-1.134900	0.127356	0.132636
Kurtosis	13.78948	18.03161	13.76512	8.175185	15.89223	15.22236	12.34043	6.994493
Jarque-Bera	1033.334	2007.640	1026.758	231.3095	1479.426	1320.013	745.7595	200.4774
Probability	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
Sum	-1.088931	7.082247	0.188780	6.334682	2.088118	7.335771	1.165660	31.86958
Sum Sq. Dev.	120.8469	132.5315	121.1043	60.42313	147.6538	96.97425	1050.123	999.6462
Observations	205	205	205	205	205	205	205	205

Source: Data processing outputs

Tables 01 and 02 present a comprehensive analysis of the summary statistics for gold, oil, and bitcoin markets, alongside Islamic and conventional stock markets, during the pre-COVID-19 and COVID-19 periods. Notably, Table 01 unveils intriguing insights from the pre-pandemic era, where both Islamic and conventional indices, namely MSCI-UK, FTSE 100, Dow Jones UK, Brent oil, and bitcoin, exhibited negative mean returns, while gold and Dow Jones Islamic displayed positive returns. However, all mean returns

were relatively modest when compared to their corresponding standard deviations, indicating inherent volatility in the markets.

In stark contrast, the COVID-19 period witnessed a shift, with all variables demonstrating positive mean returns, albeit of smaller magnitude than their respective standard deviations. It is worth highlighting that the DJ conventional index emerged as an exception, showing a negative mean return during this tumultuous period. Furthermore, the return distributions showcased distinctive characteristics: negatively skewed for both Islamic and conventional stock markets, suggesting a prevalence of negative returns over positive ones (Bala & Takimoto, 2017). Conversely, the oil, gold, and bitcoin markets displayed positively skewed return distributions throughout both time periods.

Table 03. Simple correlation analysis pre-covid-19.

Probability	DJ_UK	DJ_UK ISLAMIC	FTSE100	GOLD	MSCI_UK	MSCI_UK ISLAMIC	OIL	BITCOIN
DJ_UK	1.000000							

DJ_UK ISLAMIC	0.759161	1.000000						
	0.0000	-----						
FTSE100	0.971291	0.788165	1.000000					
	0.0000	0.0000	-----					
GOLD	-0.086928	0.026684	-0.102798	1.000000				
	0.0000	0.0000	0.0000	-----				
MSCI_UK	0.683652	0.893923	0.725312	0.015451	1.000000			
	0.0000	0.0000	0.0000	0.0000	-----			
MSCI_UK ISLAMIC	0.772436	0.748007	0.802875	-0.087678	0.699177	1.000000		
	0.0000	0.0000	0.0000	0.0000	0.0000	-----		
OIL	0.446417	0.352456	0.458319	0.021252	0.337047	0.518892	1.000000	
	0.0000	0.0000	0.0000	0.6585	0.0000	0.0000	-----	
BITCOIN	0.006109	0.021124	-0.003489	0.109804	-0.015437	-0.004542	0.004874	1.000000
	0.8989	0.6604	0.9422	0.0220	0.7482	0.9247	0.9193	-----

Source: Data processing outputs

Table 04. Simple correlation analysis during covid-19

Probability	BITCOIN	DJ_UK	DJ_UK ISLAMIC	FTSE100	GOLD	MSCI_UK	MSCI_UK ISLAMIC	OIL
BITCOIN	1.000000							

DJ_UK	0.463644	1.000000						
	0.0000	-----						
DJ_UK ISLAMIC	0.455946	0.885967	1.000000					
	0.0000	0.0000	-----					
FTSE100	0.456507	0.978576	0.889247	1.000000				
	0.0000	0.0000	0.0000	-----				
GOLD	0.312732	0.198172	0.252888	0.199425	1.000000			
	0.0000	0.0044	0.0003	0.0041	-----			
MSCI_UK	0.407983	0.884163	0.959820	0.917606	0.198919	1.000000		
	0.0000	0.0000	0.0000	0.0000	0.0042	-----		
MSCI_UK ISLAMIC	0.506879	0.826449	0.851958	0.839506	0.302664	0.853649	1.000000	
	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	-----	
OIL	-0.019691	-0.082791	-0.051034	-0.073685	-0.045302	-0.061587	-0.047496	1.000000
	0.7793	0.2379	0.4674	0.2937	0.5189	0.3804	0.4989	-----

Source: Data processing outputs

The correlation analysis presented in **Table 03** provides valuable insights into the interrelationship among various asset classes during the pre-COVID-19 period. Notably, the strongest correlation coefficients are observed between Islamic indices and their conventional counterparts. DJ Islamic index exhibits a significant correlation coefficient of 0.795 with the conventional index, while MSCI conventional and Islamic indices demonstrate a noteworthy correlation coefficient of 0.699. These findings highlight the close association between Islamic and conventional indices during this period.

Similarly, **Table 04** reveals that the correlation coefficients between Islamic and conventional indices remain remarkably high during the COVID-19 period, further emphasizing their strong interdependence. Specifically, MSCI and DJ indices display correlation coefficients of 0.885 and 0.959, respectively. This persistent correlation underscores the interconnectedness of Islamic and conventional markets during times of market turmoil.

Furthermore, the analysis indicates that gold exhibits weak correlations with other assets during both periods. It is noteworthy that gold's correlation remains relatively low, suggesting its potential as a diversification tool within investment portfolios.

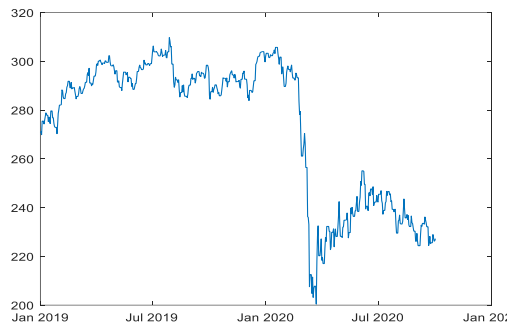
Another intriguing observation is the correlation between oil and both Islamic and conventional stock markets. The coefficients show positive correlations ranging from 0.337 to 0.518 during normal market conditions. However, during the current market turmoil, the correlation between oil and other variables becomes insignificant, indicating the disrupted relationship.

Likewise, the correlation coefficients of bitcoin are found to be insignificant during tranquil market conditions, except for its correlation with gold, which registers a coefficient of 0.109.

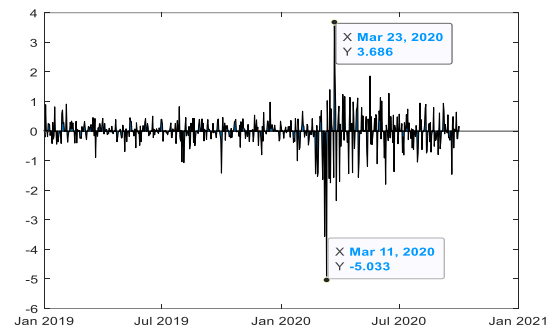
These correlation findings offer valuable insights into the dynamics between different asset classes, highlighting the interdependencies and potential diversification opportunities for investors in both normal and turbulent market conditions.

Figure 01. UK stock indexes daily prices and log returns.

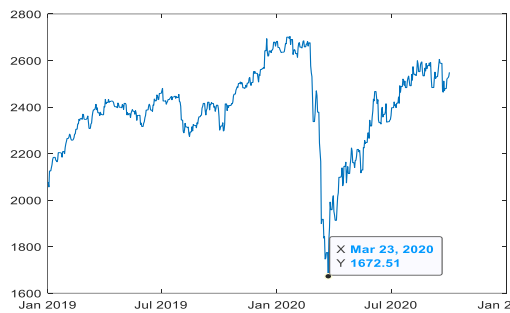
Dow jones prices



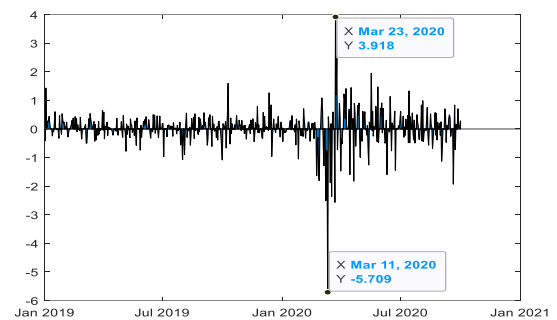
Dow Jones Returns



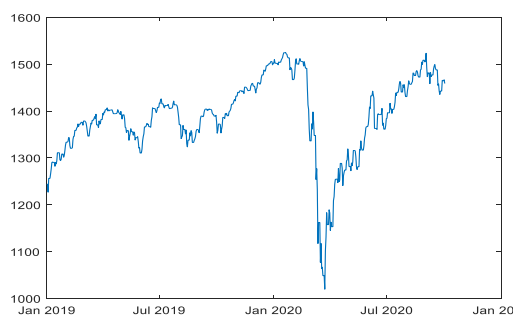
Dow Jones Islamic prices



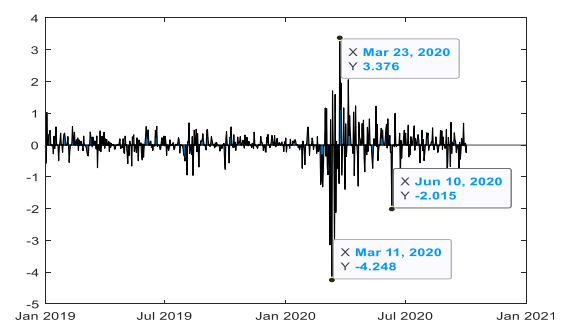
Dow Jones Islamic Returns



MSCI-Islamic prices



MSCI-Islamic returns



MSCI_UK prices

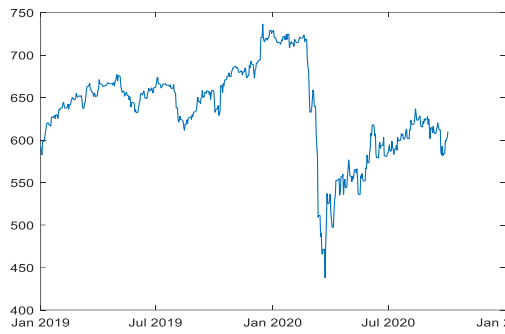


MSCI_UK returns

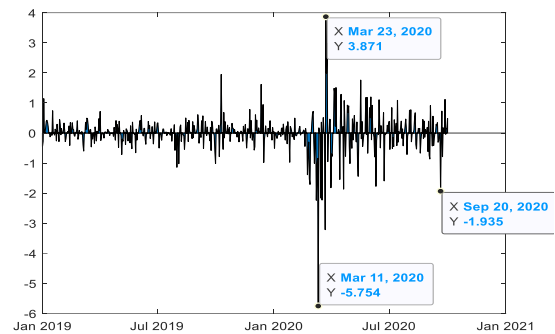


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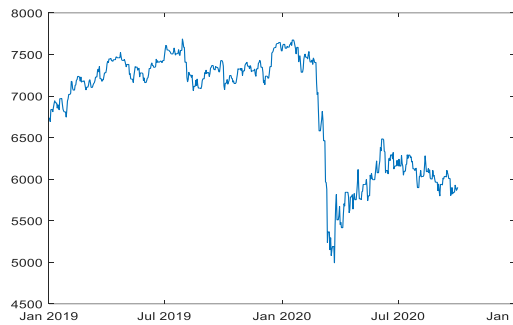
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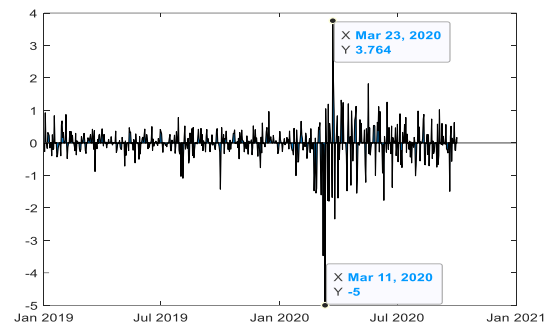
FTSE prices



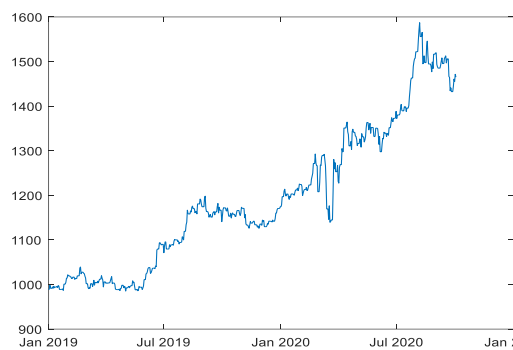
FTSE Returns



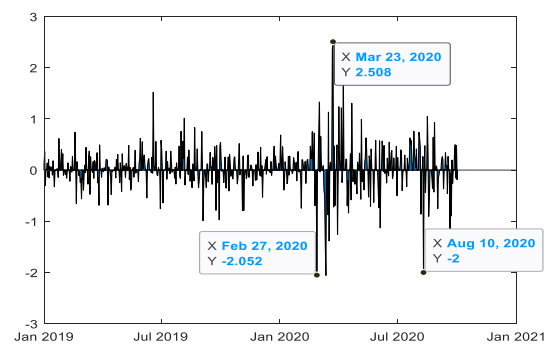
Gold Price



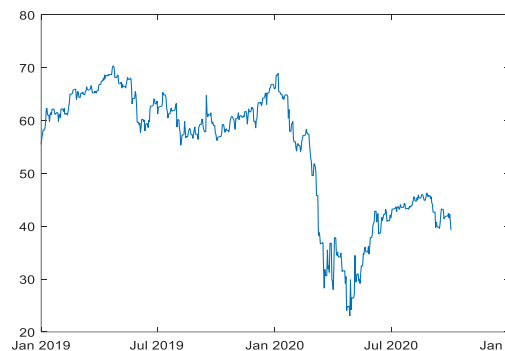
Gold Return



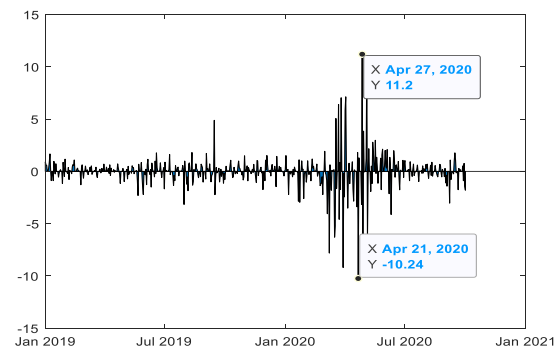
Oil price



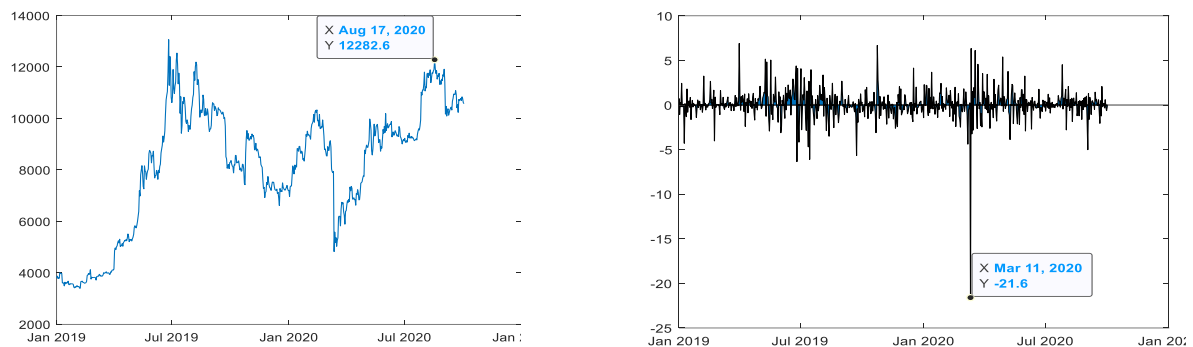
Oil return



Bitcoin Price



Bitcoin return



Source: Data processing outputs

Notes: Daily data from Jan. 2019 to October. 2020. Actual prices (graphs at left) and calculated returns[†] (graphs at right) of Conventional stock market (Dow Jones, MSCI-UK, FTSE 100), Islamic stock market (Dow Jones- UK Islamic, MSCI-UK Islamic) in addition to gold, oil and bitcoin.

Figure 01 showcases the captivating dynamics of price, return, and volatility for both conventional indexes and their Islamic counterparts, alongside the movements of gold, oil, and bitcoin, revealing a remarkable shift during the COVID-19 pandemic. The visuals vividly depict the heightened volatility experienced in both Islamic and conventional markets as a direct consequence of the global spread of COVID-19 and the stringent measures imposed by the British government, including extensive lockdown measures. Each graph unveils distinctive fluctuation patterns, with a noteworthy observation being the sharpest negative returns observed across all markets on March 11, 2020.

Furthermore, amidst this economic upheaval, gold prices demonstrated an upward trajectory, defying the initial shock caused by the British lockdown. In contrast, both bitcoin and oil experienced a sharp decline during this tumultuous period, reflecting the profound impact of the economic downturn.

These visually compelling representations of market dynamics provide valuable insights into the rapid and dramatic shifts in prices, returns, and volatilities, highlighting the unprecedented challenges faced by investors during the COVID-19 crisis.

[†] These indices are transformed to compounded stock market returns by calculating the natural logarithmic differences of the daily stock prices, that is, $r_{i,t} = \log \left(\frac{P_{i,t}}{P_{i,t-1}} \right) * 100$, where P_t and P_{t-1} represent the stock price index at time t and $t-1$, respectively. For more see (Saiti, Bacha, & Masih, 2014).

3.2. Methodology:

Multivariate GARCH models, notably BEKK (Baba, Engle, Kraft, & Kroner) and CCC (Constant Conditional Correlation), have emerged as widely utilized tools in financial research to capture volatility spillovers and correlations across various markets. These models enable researchers to explore the dynamic nature of assets, examining their roles as diversifiers, hedges, and potential safe havens.

In this study, we adopt a DCC (Dynamic Conditional Correlation) MGARCH model to precisely investigate the conditional correlations among the study variables, considering the complete series of returns. Our primary objective is to determine whether Islamic finance can serve as a safe haven during periods of market turmoil. This approach builds upon the influential work of Engle (2002), who introduced a class of multivariate GARCH models as an extension of Bollerslev's (1990) constant correlation estimator.

By employing the DCC MGARCH model, our research aims to provide a meticulous understanding of the intricate correlations and interdependencies between Islamic and conventional financial markets. The findings will contribute to the existing literature and offer valuable insights for investors, portfolio managers, and policymakers, facilitating informed decision-making processes in turbulent market environments.

The model can be demonstrated as follows:

$$\begin{cases} \mathbf{H}_t = \mathbf{D}_t \mathbf{R}_t \mathbf{D}_t, \\ \mathbf{D}_t = \text{diag}(h_{11,t}^{0.5}, \dots, h_{mm,t}^{0.5}), \\ \mathbf{Q}_t = (1 - \alpha - \beta) \mathbf{R} + \alpha \mathbf{e}_{t-1} \mathbf{e}_{t-1}' + \beta \mathbf{Q}_{t-1}, \\ \mathbf{R}_t = (\text{diag} \mathbf{Q}_t)^{-0.5} \mathbf{Q}_t (\text{diag} \mathbf{Q}_t)^{-0.5}, \end{cases}$$

Where $\mathbf{D}_t$ is a diagonal matrix of time varying deviation, $\mathbf{R}_t$ time varying conditional correlation matrix, $\mathbf{H}_t$ time varying conditional time varying covariance matrix.

The estimation of a DCC model is consisted of two main stages

Table 05. DCC MGARCH steps

Step 01	Step 02
The estimation of univariate generalised autoregressive conditional heteroscedasticity GARCH (1,1) by estimating the volatility parameter for each variable.	The estimation of time-varying conditional correlation using the standardized residuals from stage one. (the estimation of DCC MGARCH parameters)

Source: by the authors

The DCC MGARCH model is defined in eq01:

$$R_t = \sigma_{i,t}^2 = \sigma_{u,i,t}^2(1 - \alpha_i - \beta_i) + \alpha_i \sigma_{i,t-1}^2 + \beta_i \varepsilon_{i,t-1}^2 \dots \dots \dots (1)$$

Where α_i and β_i are non-negative numeral parameters with $\alpha_i + \beta_i < 1$ and $\sigma_{u,i,t}^2$ is the unconditional correlation matrix of the standardized residuals ε_t . with $i=1,2,\dots,8$

4. Empirical findings:

Table 06 and Table 07 unveil the compelling findings derived from the GARCH (1,1) and DCC MGARCH estimations, respectively, providing valuable insights into the estimated unconditional volatilities and correlations among the selected financial assets in both pre-COVID-19 and turbulent COVID-19 periods. These tables present the maximum likelihood estimations of α_i and β_i for the comprehensive set of eight investment assets under examination. Notably, during tranquil markets (pre-COVID-19), all returns volatilities estimates exhibit remarkable statistical significance at a level of less than 1%, indicating their robustness and reliability. However, amidst the challenging backdrop of the COVID-19 downturn, a notable transformation occurs as the majority of returns lose their statistical significance, with the exception of gold, which maintains its significance for the α_i parameter. This meticulous analysis sheds light on the dynamic nature of volatilities and correlations, unraveling the impact of the COVID-19 crisis on financial assets.

Table 06. estimate of the DCC MGARCH model in the pre-covid-19

Parameter	Estimate	Standard error	T-ratio [Prob]
α_DJ_UK	0.121952	0.055635	2.192 (0.0289)
$\alpha_DJ_UK\ Islamic$	0.093798	0.037529	2.499 (0.0128)
$\alpha_MSCI_uk\ Islamic$	0.179829	0.056592	3.178 (0.0016)
α_MSCI_uk	0.129850	0.054308	2.391 (0.0172)
α_FTSE	0.127945	0.053771	2.379 (0.0178)
α_GOLD	0.070528	0.051219	1.377 (0.0692)
α_OIL	0.063342	0.031119	2.035 (0.0424)
$\alpha_Bitcoin$	0.190185	0.11573	1.643 (0.0010)
β_DJ_uk	0.850459	0.055343	15.37 (0.0000)
$\beta_DJ_uk\ Islamic$	0.825590	0.053050	15.56 (0.0000)
$\beta_MSCI_uk\ Islamic$	0.811848	0.041390	19.61 (0.0000)
β_MSCI_uk	0.811625	0.045185	17.96 (0.0000)
β_FTSE	0.847050	0.046532	18.20 (0.0000)
β_GOLD	0.806211	0.064556	12.49 (0.0000)
β_OIL	0.947611	0.025596	37.02 (0.0000)
$\beta_Bitcoin$	0.515036	0.17949	2.870 (0.0043)
$\sigma 1$	0.068559	0.018176	3.772 (0.0002)
$\sigma 2$	0.795764	0.10238	7.772 (0.0000)
DF	2		

Source: data processing outputs

Parameter	Estimate	Standard error	T-ratio [Prob]
α_{DJ_uk}	0.021876	0.014792	1.479 (0.1407)
$\alpha_{DJ_uk Islamic}$	0.020895	0.013890	1.504 (0.1341)
$\alpha_{MSCI_uk Islamic}$	0.044129	0.028863	1.529 (0.1279)
α_{MSCI_uk}	0.032009	0.017700	1.808 (0.0720)
α_{FTSE}	0.022109	0.015195	1.455 (0.1472)
α_{GOLD}	0.095228	0.054960	2.455 (0.0143)
α_{OIL}	0.158671	0.087443	1.815 (0.0711)
$\alpha_{Bitcoin}$	0.006577	0.0062525	1.052 (0.2941)
β_{DJ_uk}	0.956107	0.021571	44.32 (0.0000)
$\beta_{DJ_uk Islamic}$	0.948973	0.023329	40.68 (0.0000)
$\beta_{MSCI_uk Islamic}$	0.918516	0.040827	22.50 (0.0000)
β_{MSCI_uk}	0.934972	0.024796	37.71 (0.0000)
β_{FTSE}	0.955423	0.022531	42.41 (0.0000)
β_{GOLD}	0.859887	0.044659	19.25 (0.0000)
β_{OIL}	0.855457	0.051091	16.74 (0.0000)
$\beta_{Bitcoin}$	0.959175	0.022557	42.52 (0.0000)
σ_1	0.037540	0.016605	2.261 (0.0250)
σ_2	0.757982	0.060433	12.54 (0.0000)
DF	2		

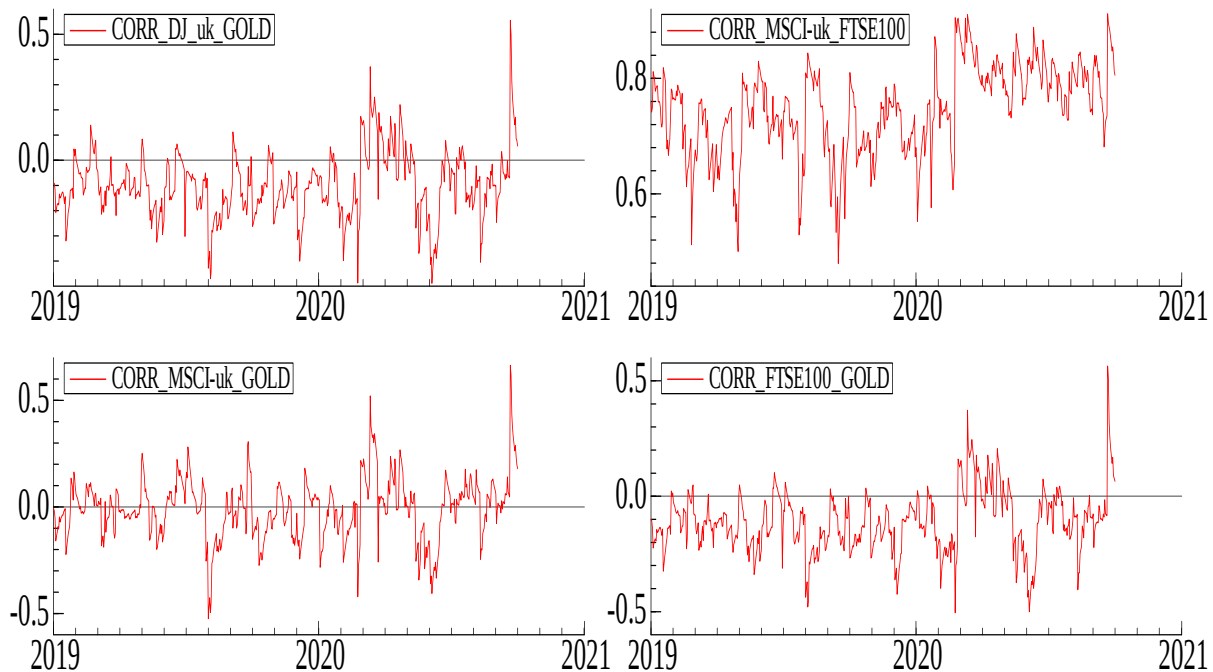
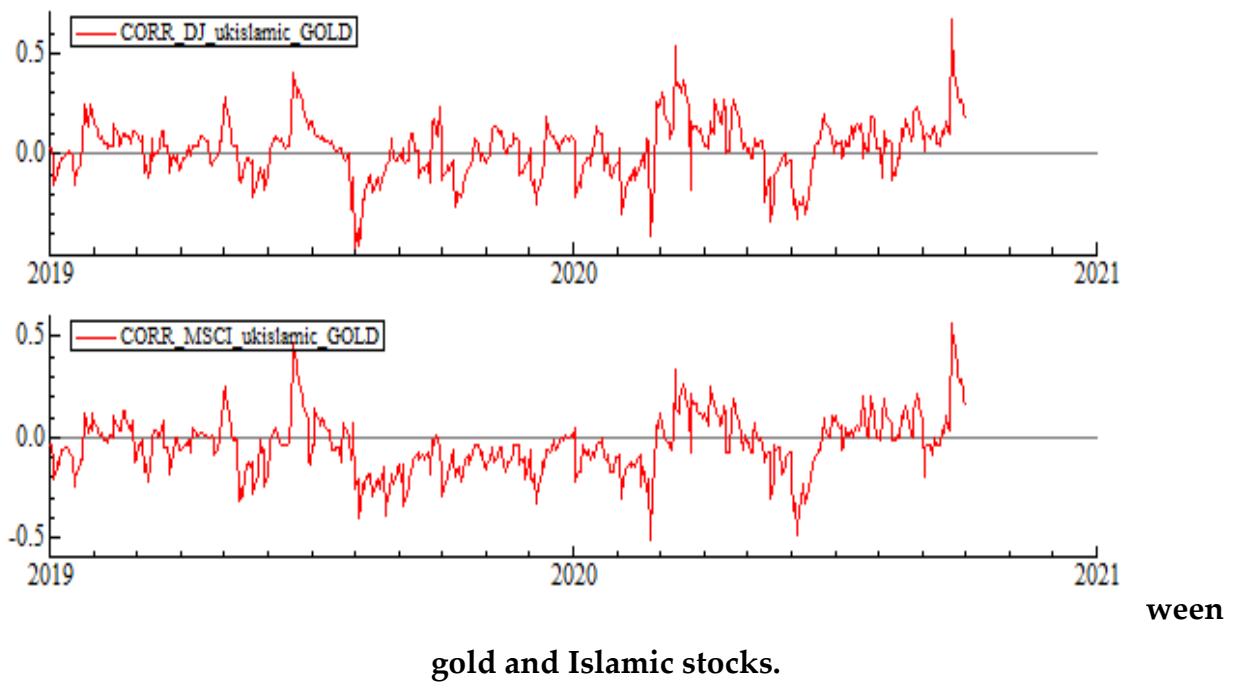
Source: data processing outputs

Table 07. estimate of the DCC MGARCH model in the pre-covid19

Figures 02, 03, and 04 illuminate the dynamic correlations that exist among various key components within the financial landscape. These figures specifically shed light on the correlations between Gold-Islamic stocks, Gold-conventional stocks, Islamic stocks-Conventional stocks, as well as oil and bitcoin with all the other assets.

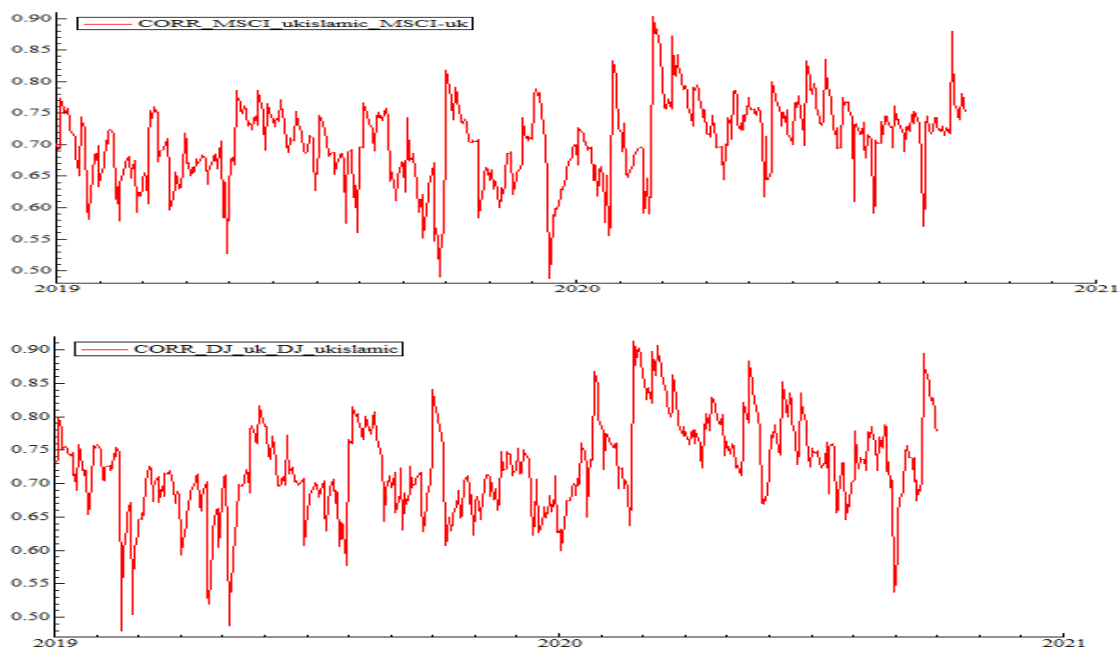
The visual representation provided by these figures offers valuable insights into the interplay and relationships between these significant elements. By examining the correlation patterns, we gain a deeper understanding of the interconnectedness and dependencies among these assets.

Figure 02. the dynamic conditional correlation bet



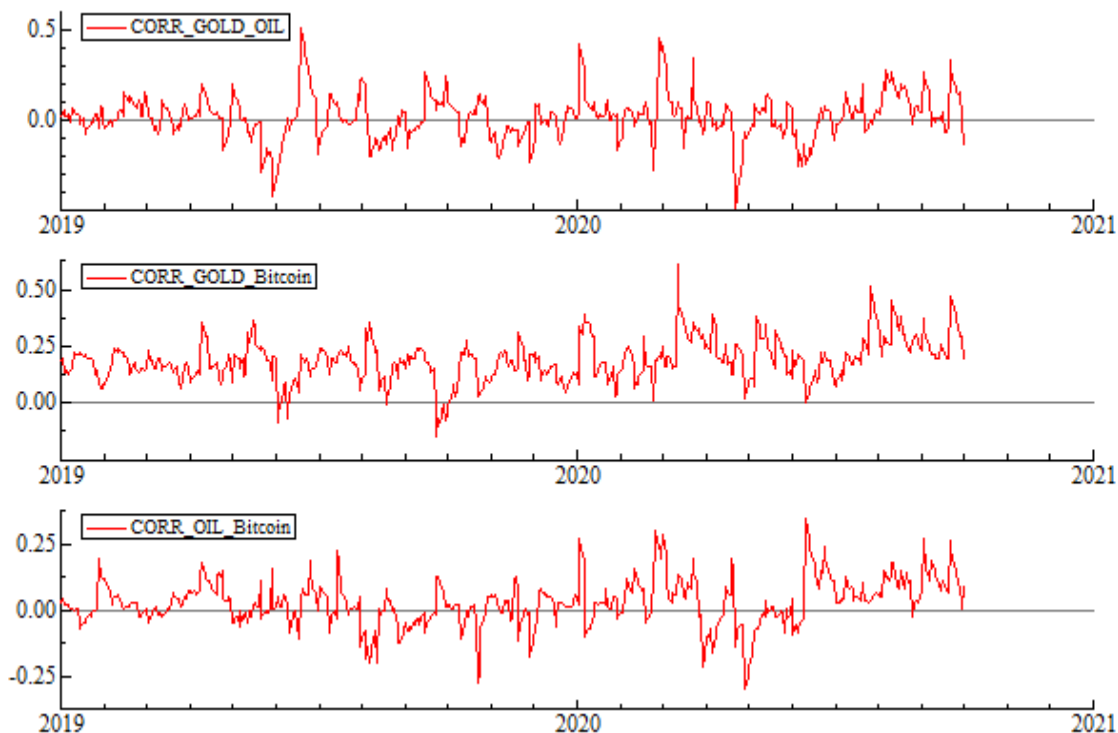
Source: data processing outputs

Figure 03. the dynamic conditional correlation between Islamic and conventional stocks.



Source: data processing outputs

Figure 04. the dynamic conditional correlation for oil and bitcoin.



Source: data processing outputs

The figures presented above provide valuable insights into the dynamics of financial markets during the novel coronavirus pandemic. Notably, a robust negative correlation is evident between gold and Islamic stocks, mirroring the pre-COVID-19 period. This suggests that gold can serve as a hedge during bullish markets, showcasing its hedging characteristics in both normal and stress times across various markets, with the exception of cryptocurrencies.

Integrating gold assets within portfolios can potentially mitigate systematic risks associated with Islamic and conventional stock markets, as well as the oil market, during the COVID-19 crisis. This finding aligns with previous studies (Baur & Lucey, 2010; Baur & McDermott, 2010; Baur & McDermott, 2016) and confirms the role of gold as a safe haven for British and international investors amidst the pandemic, as also highlighted by the research conducted by Salisu et al. (2020).

In contrast to earlier research (Akhtar & Jahromi, 2017; Bahloul, Mroua, & Naifar, 2017), the Islamic stocks market demonstrates a strong correlation with its conventional counterparts, as well as other markets, during the current crisis. This diverges from the behavior observed during the global financial crisis of 2008. It is important to note that Islamic investments do not serve as a safe haven in the current downturn, supporting the findings of Rejeb & Arfaoui (2019). However, Islamic stocks do exhibit strong diversification characteristics during tranquil periods.

Regarding Bitcoin and oil, their correlations fluctuate between positive and negative values, with a preference for negative trends during the pandemic. This implies that Bitcoin holds promise as a hedge against market downturns.

These findings contribute to our understanding of market dynamics during the COVID-19 pandemic, providing valuable insights for investors and policymakers. Recognizing the role of gold as a hedge and understanding the behavior of Islamic stocks, Bitcoin, and oil enables more informed decision-making and effective risk management strategies in these challenging times.

Conclusion:

Our study focuses on major financial assets in the London Stock market to investigate the effects of volatility and dynamic correlations between Islamic stocks, conventional stocks, gold, oil, and bitcoin markets during the COVID-19 pandemic. Utilizing the DCC MGARCH model, we aim to test the hypothesis that "Islamic Stocks

can be a safe haven." However, our findings reject this hypothesis, indicating that only gold exhibits characteristics of a safe haven across all markets in the UK. Conversely, bitcoin serves as a diversifier during this phase and can act as a safe haven against oil fluctuations, aligning with the results of Bouri, Gupta, Tiwari, and Roubaud (2017).

Nevertheless, according to S&P forecasts, the Islamic investment industry has the potential for further integrated and transformative growth, particularly through enhanced standardization and the adoption of financial technology. By limiting its correlation with conventional stocks, the Islamic investment industry can seize opportunities for greater standardization and transformation, ensuring a more resilient and robust market presence.

In conclusion, our research sheds light on the volatility effects and dynamic correlations among various financial assets during the COVID-19 pandemic in the UK. The findings highlight the significance of gold as a safe haven and the diversification potential of bitcoin. These insights are crucial for investors and policymakers in effectively managing risks and making informed investment decisions during challenging times. As the Islamic investment industry continues to evolve, embracing technological advancements and strengthening its standardization efforts will contribute to its growth and resilience in the face of future uncertainties.

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