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How Resilient were Financial Markets? Evidence from West Asia North Africa (WANA) Region

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ABSTRACT

The Covid-19 pandemic has resulted in an unprecedented contraction in the global economic and financial markets and has posed massive disruption to the financial sector and Islamic financial markets were also on 'no exception'. The present study examines the resilience of conventional and Islamic bond markets in the West Asia North Africa region. For empirical analysis GARCH tests were applied to the daily data of bond and Sukuk indices from January 2019 to February 2021. Results indicated positive mean returns for all the period under study. Further, GARCH results confirmed the persistence of higher volatility in the selected indices under study.

Keywords: Covid-19, GARCH Model, Sukuk, Volatility.

INTRODUCTION

The Covid-19 pandemic has hit the world in an unprecedented manner and resulted in massive contraction in the global economic and financial performance. Even though Covid-19 initially started as a health emergency, soon it became an economic catastrophe similar to the Global Financial Crisis of 2008 (Hasan et al. 2022). The pandemic has posed a massive disruption to the financial sector and Islamic financial markets were also on 'no exception'. There have been various reports published on the state of contraction of growth. There are also couple of estimates regarding the growth, unemployment and other financial integrals of various countries. There have been many studies which tried to examine the impact of pandemic on the financial markets.

Past few years witnessed monumental growth of Islamic financial industry at a growth rate of 10.3% annually and reached US\$3.50 trillion in the global market capitalisation in 2020 (Sherif 2020). Meanwhile Islamic finance has attracted investors attention which include both Muslims and non-Muslim investors particularly after the resilience it showed after the crisis, mainly the global financial crisis of 2008 (Akhtar and Jahromi 2017). Those assets which follow the

Islamic financial principles are expected to expose less to Covid-19 adversely, this scenario motivates to investigate into the resilience of Islamic financial markets with that of conventional markets in the context of Covid-19 as it proved its resilience in the time of global financial crisis.

There have been studies carried on the comparison of both the markets and many of them provided a mixed result, some proving resilience of conventional indices over Islamic indices, while others produced the results vice versa. Against this backdrop, this study tried to examine the resilience of both conventional and Islamic bond markets based on parameters like return and volatility. The remaining part of this study is as follows. Part 2 comprises literature review and part 3 explains the data and methods. Part 4 includes the empirical findings and discussions and ending with the conclusions in part 5.

LITERATURE REVIEW

There are numerous literatures published on both conventional and Islamic finance. Among those there is significant amount of studies which attempted to compare the performance of both these financial markets. Most of the studies attempted to compare the performance of both conventional stocks with that of Islamic stocks, while relatively few others attempted to study the performance of Islamic bonds, also called Sukuk, with that of conventional bonds.

Debate over the Islamic and conventional stock indices end up in few headings. Few of the studies say that due to sharia screening of Islamic stocks it might be riskier than conventional peers. Another argument says that Islamic stock indices outperform conventional stock indices, because it avoids poor performing stocks. There are also studies which explored the decoupling of both markets and the overall analysis shows mixed results. (Sherif 2020) (Aarif et al., 2021). There are also studies conducted on the relatively new Islamic financial asset, Sukuk which is gaining popularity among investors and policy makers as a novel tool for financing. Those studies which tried to compare both bonds and Sukuk found that these two are entirely different instruments based on their underlying structure. Especially Sukuk, unlike bonds, work under various contractual structures (Alam et al., 2013). Few studies also explored the diversification benefit by including Sukuk as an asset in the portfolios and suggested that they can create benefit during the time of economic slowdowns (Pirgaip et al., 2021) (Al-Yahyaee et al. 2020).

Daoudi Jawad and Faris (2019) in a comparative study between bond and Sukuk examined the volatility behaviour of MENA Sukuk and Bond indices for 2013-2019 period using GARCH tests and found that Sukuk are less volatile than bonds. The conditional volatility for bonds has

more turbulence and risk. They opined that MENA Sukuk are less risky and more stable in comparison with MENA Bond. Bokhtiar Hasan et al. (2022) explored the resilience of Islamic financial markets and conventional financial markets during Covid-19 pandemic period. The study used two bond and five Islamic stock indices and their conventional counterparts for the analysis. For conventional and Islamic stocks, indices from World, Europe, Developed, Emerging and US regions were considered. On the other hand, GCC and the World were chosen for bond markets. They found that stock indices from both markets were affected similarly by the turbulence made by Covid-19 hence failing to provide diversification benefits. In contrast, Sukuk exhibited low dependence on conventional bonds, which indicates diversification benefit proving the resilience of Sukuk during crisis period.

To explore the diversification benefits in MENA region, Asl and Rashidi (2021) assessed the financial performance of few companies from the area during Covid-19 period. They empirically investigated the spillovers between stock and security indices, including both conventional bond and Sukuk. Time period of the study was from 2013 to 2020. By employing tests like VAR and GARCH, they found that there is no evidence of shock, volatility and asymmetric shock spillover between Sukuk and stock index of MENA implying Sukuk is behaving independently.

Parimambudi et al. (2023) analysed the interconnectedness between bond and Sukuk in GCC and MENA countries. They used TVP VAR extended connectedness method for the analysis of data ranging from January 2020 to October 2023. The period included major events like Covid pandemic, Russia-Ukraine war and Israel-Palestine War. The study found interconnectedness between bond and Sukuk market in both regions. They suggested that Sukuk in these both regions can be used as a diversification asset as compared to bonds.

Still the world is facing the ripples of pandemic, many academic works attempted to explore the impact of this health emergency of Covid 19 crisis on various financial markets. Among those there are few studies which attempted to study the impact of pandemic on the Islamic financial markets, hedging capabilities and diversification benefits. From the review of literature its evident that there have been comparative studies taken place and their findings are contrary and mixed. This paper will attempt to examine the resilience of both conventional and Islamic bond markets, by investigating in terms of their return and volatility pattern before and during the pandemic period.

DATA AND METHODS

Data

This study tries to examine the resilience of conventional and Islamic bond market during Covid 19 crisis period. Bond and Sukuk of indices of two major regions were selected for the analysis. The regions are Middle East and North Africa (MENA) region and Gulf Cooperation Council (GCC) countries respectively. The indices representing the aforesaid regions are listed in the table 1. Daily closing prices (in US Dollar) for the indices were collected from Bloomberg Database for the period 01-01-2019 to 26-02-2021. The total period was subclassified into Covid and Pre-Covid period following the classification of Hasan et al. (2022). The daily log returns were calculated using the following equation.

$$\text{Log Returns} = \ln\left(\frac{P_t}{P_{t-1}}\right)$$

In the above equation, P_t and P_{t-1} is the closing price of index on current day and previous day respectively. The graph plotting the returns are in the figure 1.

Table 1: Indices selected for the study

Region	Index
MENA	S&P MENA Bond Index
	S&P MENA Sukuk Index
GCC	S&P GCC Bond Index
	S&P GCC Sukuk Index

Method

GARCH (1,1) model

Autoregressive Conditional Heteroscedasticity (ARCH) model is developed by Robert Engle (1982) for capturing time varying volatility in financial time series data. The model says that volatility of the present period is correlated with the volatility of the previous period and the presence of ARCH effect indicates autocorrelation in the variance. The basic ARCH model is as follows:

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2$$

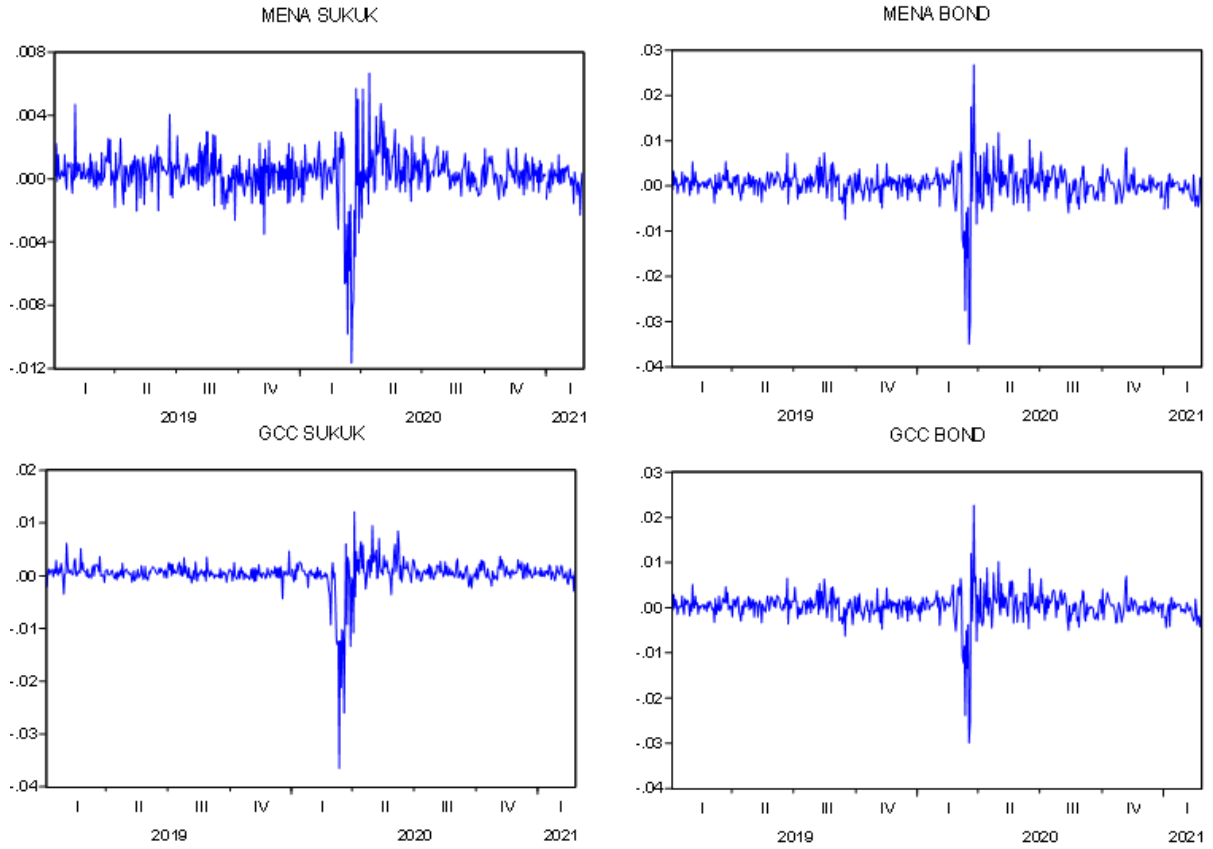


Figure 1: Return series of the indices

Later due to the shortcomings of the model, Bollerslev and Taylor developed Generalised Autoregressive Conditional Heteroscedasticity (GARCH) model in 1986 (Brooks 2019). As per GARCH, the conditional variance of current time depends on the squared residual terms of previous period and also on its conditional variance as well. GARCH (1,1) can be expressed as GARCH (p, q) formulation, where current conditional variance is parametrized to depend upon p lags of squared error and q lags of conditional variance.

$$\sigma_t^2 = \alpha_0 + \alpha_1 u_{t-1}^2 + \alpha_2 u_{t-2}^2 + \cdots + \alpha_p u_{t-p}^2 + \beta_1 \sigma_{t-1}^2 + \beta_2 \sigma_{t-2}^2 + \cdots + \beta_q \sigma_{t-q}^2$$

And a GARCH (1,1) model is expressed as:

$$\sigma_t^2 = \alpha_i + \sum_{i=1}^p \alpha_i \varepsilon_{t-i}^2 + \sum_{j=1}^q \beta_j \sigma_{t-j}^2$$

Where ' p ' is the ARCH term and ' q ' is the GARCH term and magnitude of parameters of α and β (ARCH and GARCH) determine the persistence of volatility.

RESULTS AND DISCUSSION

Descriptive statistics

The descriptive statistics of the collected data were computed for all the three periods. Firstly, the descriptive statistics of all the selected bond and Sukuk indices were calculated for total period and is presented in table 2. From the table, its seen that during the total period, MENA bond with a return of 0.000347 outperformed MENA Sukuk in terms of return which is 0.000297. While for GCC, Sukuk had higher returns (0.000343) than its conventional counterpart (0.000336) for the total period. Observing the standard deviation values, it could be seen that bond indices from both the region has higher value of risk than their Islamic counterparts.

Table 2: Descriptive statistics for total period

	MENA Bond	MENA Sukuk	GCC Bond	GCC Sukuk
Mean	0.000347	0.000297	0.000336	0.000343
Std. Dev	0.003890	0.001540	0.003321	0.003132
Maximum	0.026843	0.006674	0.022718	0.012128
Minimum	-0.035001	-0.011653	-0.029930	-0.036501
Skewness	-2.287305	-1.933937	-2.397702	-5.323937
Kurtosis	30.57637	17.42736	30.19753	52.47145
Jarque Bera	18167.16	5187.287	17732.82	59538.65
Probability	0.000000	0.000000	0.000000	0.000000

Source: Authors' calculation.

The descriptive statistics for Pre Covid period are presented in the table 3. The Pre Covid period ranges from 01-01-2019 to 31-12-2019. The returns of bond and Sukuk from MENA region is 0.000524 and 0.000378 respectively. As evident, returns of MENA bond is higher than that of MENA Sukuk with greater standard deviation. But for GCC region the Sukuk (0.000568) exhibited higher returns than that of bond (0.000488). The standard deviation was relatively higher for bond index.

Table 3: Descriptive statistics for Pre-Covid Period

	MENA Bond	MENA Sukuk	GCC Bond	GCC Sukuk
Mean	0.000524	0.000378	0.000488	0.000568
Std. Dev	0.002051	0.001081	0.001832	0.001135
Maximum	0.007319	0.004708	0.006584	0.006130
Minimum	-0.007414	-0.003503	-0.006222	-0.004366
Skewness	0.028876	0.167579	0.068965	0.661669
Kurtosis	4.337941	4.544268	4.246622	7.570428

Jarque Bera	19.35401	26.94781	16.97626	244.3237
Probability	0.000063	0.000001	0.000206	0.000000

Source: Authors' calculation

Descriptive statistics for Covid period ranging from 01-01-2020 to 26-02-2021 is presented in table 4. Contrasting to the pre Covid period, the Sukuk index of MENA had higher return than bond and vice versa in the case of GCC. The bond index of GCC has return of 0.000205 and Sukuk had a return of 0.000148. The standard deviation of both bond indices is higher implying higher level of risk.

Table 4: Descriptive statistics for Covid period

	MENA Bond	MENA Sukuk	GCC Bond	GCC Sukuk
Mean	0.000194	0.000227	0.000205	0.000148
Std. Dev	0.004959	0.001848	0.004204	0.004140
Maximum	0.026843	0.006674	0.022718	0.012128
Minimum	-0.035001	-0.011653	-0.029930	-0.036501
Skewness	-1.990213	-2.050410	-2.140447	-4.193381
Kurtosis	21.31231	14.97398	21.61413	31.33483
Jarque Bera	4375.171	1995.738	4544.949	10878.62
Probability	0.000000	0.000000	0.000000	0.000000

Source: Authors' calculation.

Before proceeding further, the unit root tests for the selected indices were performed. Augmented Dickey Fuller test was employed for checking the presence of unit root. At 5% level, all the indices were found to be stationary at level. The result of the test is displayed in the table 5. Also, all the series were checked with ARCH LM test to know the presence of ARCH effects and it was found that for total period and Covid period, the statistics were significant. For pre Covid period, the results were insignificant, thus ARCH effects were not present. Further proceeded for GARCH (1,1) model for total period and Covid period and the results are presented in the table 6 and table 7.

Table 5: Unit root test results

Index	ADF statistic	P Value
Total period		
MENA Bond	-12.32993	0.0000
MENA Sukuk	-9.910147	0.0000
GCC Bond	-12.05389	0.0000
GCC Sukuk	-6.082432	0.0000
Pre Covid		

MENA Bond	-9.165877	0.0000
MENA Sukuk	-19.83715	0.0000
GCC Bond	-9.251940	0.0000
GCC Sukuk	-15.33443	0.0000
Covid Period		
MENA Bond	-12.25697	0.0000
MENA Sukuk	-6.405147	0.0000
GCC Bond	-12.08414	0.0000
GCC Sukuk	4.214624	0.0007

Source: Authors' calculation.

GARCH (1,1)

Table 6 and 7 presents the GARCH results for total period and Covid period of the selected indices. In the GARCH results, Ω is the constant and α and β are the ARCH and GARCH terms respectively. If the sum of $\alpha + \beta$ is closer to 1, it means that volatility is highly persistent, which means higher changes in the series is further followed by higher changes and smaller changes is followed by further smaller changes, thus clustering of volatility.

Table 6: Results of GARCH for total period

	MENA Bond	MENA Sukuk	GCC Bond	GCC Sukuk
Ω	4.96E-07 (0.0001)	9.42E-08 (0.0000)	3.81E-07 (0.0001)	1.08E-07 (0.0000)
α	0.217892 (0.0000)	0.142085 (0.0000)	0.212134 (0.0000)	0.213022 (0.0000)
β	0.731571 (0.0000)	0.796816 (0.0000)	0.735888 (0.0000)	0.769131 (0.0000)
$\alpha + \beta$	0.949463	0.938901	0.948022	0.982153

Source: Authors' calculation

From the table 6, all the coefficients of the constant for all the indices for total period of the analysis are found to be positive. The sum of ARCH and GARCH parameters ($\alpha + \beta$) for all the bond and Sukuk indices in total period is closer to 1, which means that volatility shocks have a very high level of persistence implying that volatility remains high and it will take time for the mean reversion.

Table 7: Result of GARCH for Covid period

	MENA Bond	MENA Sukuk	GCC Bond	GCC Sukuk
Ω	4.49E-07 (0.0300)	4.54E-08 (0.0161)	2.78E-07 (0.0397)	1.57E-07 (0.0028)

α	0.353125 (0.0000)	0.154386 (0.0000)	0.340175 (0.0000)	0.307446 (0.0000)
β	0.663195 (0.0000)	0.822913 (0.0000)	0.681026 (0.0000)	0.699378 (0.0000)
$\alpha + \beta$	1.01632	0.977299	1.021201	1.00684

Source: Authors' calculation

The GARCH results for the Covid period of the indices under study is presented in table 7. Here also the coefficients of the constant for all the indices turned out to be positive. The sum of parameters ($\alpha + \beta$) for only MENA Sukuk is less than 1, but closer to it. This means that volatility is highly persistent and will revert to mean in future. But for all other indices, the sum of parameters is greater than 1. Which means the shock is explosive in nature, volatility increase over time rather than reverting to it mean, suggesting an unstable volatility process.

CONCLUSION

This particular study attempted to examine the resilience of conventional and Islamic financial markets during crisis period in the West Asia North Africa region. Two bond indices and their Sukuk counterparts from MENA and GCC region were analysed. The indices were examined for total period, pre Covid period and Covid period. All the indices exhibited positive mean returns for all the periods under study. Further all the indices were stationary at level during Augmented Dickey Fuller test. Before proceeding to GARCH tests, series were checked to detect the presence of ARCH effect the presence was confirmed in the total period and Covid period with ARCH LM test. Results of the GARCH tests, showed persistence of volatility, where higher shocks are followed by further higher shocks and smaller shocks are followed by further smaller shocks for the all the indices for the total period. But for the Covid period, volatility of all indices except MENA Sukuk were explosive in nature. The Sukuk indices were found to be relatively better than bond indices in the analysis.

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