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COMPARISON THE VOLATILITY OF ISLAMIC EQUITY INDICES AND THEIR CONVENTIONAL COUNTERPARTS BASED ON EVIDENCE FROM GCC S&P INDEX FAMILY

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ABSTRACT

An asset's volatility describes the spread of this variable which plays a vital role in several financial applications. Some of the primary usages are estimating the value of market risk, pricing financial derivatives, option-pricing techniques and is also used for risk management applications. It is crucial for financial institutions to be able to estimate their future values. This study compares the volatility of S&P GCC Composite Shariah index with conventional benchmarks from Gulf Cooperation Council (GCC) countries. The main goal is to provide evidence from a new index family whether investors who invest in Islamic equity are sacrificing performance or not. Orthogonal Generalized Autoregressive Conditional Heteroskedasticity (OGARCH) (1,1), (1,2), (2,1) and (2,2) framework is employed on daily returns data for the period of April 2007 to March 2018. The results show that S&P GCC Composite Shariah Index has similar risk profile as its conventional counterpart the S&P GCC Composite Index and that investors who wish to invest in Islamic securities are not significantly worse off than those who choose non-Islamic securities and will not sacrifice financial performance.

INTRODUCTION

Understanding the volatility of equity market has become a crucial element not only among researches and analysts, but also among investors. Investors are

concerned about the risk and returns on their investment. Simply, volatility of asset return is the measure of risk related to the financial assets or it is the standard deviation of returns [1]. The higher the fluctuations in assets price over a short period, the higher the volatility. Rizvi [2], applied MFDF analysis on a total of 22 markets divided into 11 markets each from Islamic and developed part of the world. Using daily return 2001 until 2013, they concluded that Islamic markets had highly efficient and less volatile performance particularly in crisis periods and on top of them were Malaysian, Indonesian and Turkish markets. Using a GARCH model applied on a number of global indices from the DJ family, Ben Rejeb and Mongi [3] concluded that Islamic markets are not fully immunized against financial crises effects. Nonetheless, it had successfully escaped an important part of the last Subprime crisis risky effects. While on the other hand Charles et al. [4] using the same index family and methodology, concluded that there is no significant difference in volatility between both indices.

El Khamlichi et al. [5] employed Error Correction Model on daily prices of Dow Jones, Financial Times, Standard & Poor, and Morgan Stanley's Islamic and conventional indices starting from their available date to 2011, have concluded that both Islamic and conventional indices have the same level of high volatility. By applying Ordinary least squares (OLS), Hussein [6] has examined the performance of the FTSE Global Islami Index versus the FTSE All-World Index. Using a monthly return data from 1996 until 2003 divided into two sub-periods, bull and bear periods. The results show that that Islamic indices outperform during bull period but underperform during bear period. Evidence from the same period by Hussein [7] confirms the previous, which shows that FTSE Global Islamic Index and DJIMI tend to be less volatile than its conventional counterpart. In conformity was the study conducted by Hakim and Rashidian [8], where they concluded that Islamic index was influenced by factors independent of the broad market or interest rate which is known as unsystematic risk. A different finding was concluding using a different approach, Al-Zoubi and Maghyereh [9], applied APARCH on data for the period of 1996 – 2005. It was concluded that the Dow Jones Islamic Index outperforms the Dow Jones WORLD Index in terms of risk.

Albaity and Ahmad [10] conducted their analysis by applying Vector Autoregression and Impulse Response Analyses methodology on daily return of KLSI and KLCI during the period April 1999 to December 2005 and have found that no evidence of significant statistical differences in risk-adjusted returns between Islamic and conventional stock market indices. In Malaysia, GARCH (1,1) along with VAR analysis were applied on another Islamic proxy which is RHBII. Monthly data for the period 1992 to 2000 were used in the mentioned study. Yusof and Majid [11] concluded that interest rate was not able to affect Islamic stock market volatility. In Pakistan, Karachi Meezan Islamic was providing highest returns as compared to its conventional counterpart Index [12]. The case is not very different in GCC. A study conducted by Miniaoui et al. [13] using weekly data for the period of December 2003 to the end of October 2013, with a sample size of 364 observations and applying GARCH model concluded that GCC Islamic index

exhibits similar attributes of the conventional indices in all the periods of analysis and that it has similar risk profile as its conventional counterparts.

From a diversification opportunity point of view, few studies have addressed the existence of this issue. Hakim and Rashidian [14] found that even with applying investment restrictions diversification of DJ was not affected. Guyot [15] examined the same index family and found lack of cointegration over the long term between Islamic and conventional indices which means diversification benefits do exist. Kok et al. [16] also had a similar conclusion. Therefore, this study compares the volatility of S&P GCC Composite Shariah index with conventional benchmarks from Gulf Cooperation Council (GCC) countries.

METHODOLOGY

Data Collection and Sample Selection

Daily total return data is used for analysis for the period 23 April 2007 to 30 March 2018, with a sample size of 2855 observations. The selection of the sample period was mainly based on the Islamic Index start date. The use of daily data along with the chosen model will be more accurate than the other frequency estimates [17]. All the data is extracted from Bloomberg terminal and the data analysis is performed using Eviews. Table 1 presents the indices included in this study.

Table 1: Indexes and symbols

Categories	Index Types	Symbol
Islamic Index	S&P GCC Composite Shariah	SPSHG
Conventional Index	S&P GCC Composite	SEMGGCPD
Bahrain	Bahrain Bourse All Share Index	BHSEASI
Kuwait	Kuwait Stock Exchange Index	KWSEIDX
Oman	Muscat Securities MSM 30 Index	MSM30
Qatar	Qatar Exchange Index	DSM
Saudi Arabia	Tadawul All Share Index	SASEIDX
UAE	Abu Dhabi Securities Market General Index	ADSMI

Descriptive statistics and Correlation

Descriptive statistics provide a primary understanding of the characteristics of the time series in terms of mean returns, standard deviation, and other characteristics like skewness and kurtosis. Jarque-Bera test is conducted to identify if the time series are normally distributed. Moreover, correlations are calculated to estimate the strength and direction of relationship among the indices. Furthermore, returns are plotted on graphs showing the co-movement between S&P GCC Composite Shariah and S&P GCC Composite index.

Unit-root Test of Dickey-Fuller (ADF)

Testing for the order of integration is standard in applied econometric work. The way a test is performed in applied work depends on the motive behind the

test. The most common motive is to investigate the properties of the prior to the construction of an econometric model. In this case, unit root tests are mainly a descriptive tool performed to classify series as stationary and non-stationary. A widely used test for testing I(1) versus I(0) is the Dickey-Fuller test. This test has as the null that the series is I(1) [18].

Sharpe Ratio

The Sharpe ratio [19] is a measure of volatility-adjusted performance and is calculated by dividing excess return by the standard deviation of excess return. Higher Sharpe measures are associated with superior performance

OGARCH Model

This research employs a Univariate Generalised Autoregressive Conditional Heteroscedasticity (GARCH) model which was very successful for volatility estimation in financial markets. It has been validated empirically that GARCH models generate more realistic long-term forecasts. The creation of large covariance matrices has presented a great challenge to specialists for many years. Large covariance matrices have a chief role to play in investment analysis, because the risk of a portfolio is generally determined by the covariance matrix of all the assets in the portfolio.

Calculation of such matrices is a complex task and often very simple measures of volatility and correlation are used in it. Here comes the orthogonal factor part, which helps in simplifying the process of producing these large matrices on a daily basis. This study applies orthogonal factorization in conjunction with standard volatility estimation model which is the autoregressive conditional heteroscedasticity (GARCH). “The method is computationally very simple: it takes the univariate volatilities of the first few principal components of a system of risk factors and the factor weights matrix of the principal components representation to produce a full covariance matrix for the original system.” [17]. In the world of financial markets, which is characterized by uncertainty, it makes sense to distill the important information into a few factors and cutting out any 'noise' in the data which the orthogonal GARCH method can very much help in.

RESULT AND DISCUSSION

Correlation Analysis

The correlations between the indices are positive, which presented in Table 2. The Islamic and conventional indexes are highly positively correlated with each other and they have the highest correlation with the Saudi index. This is logical as Saudi Arabia has more than 70% country allocation in both indices. Islamic and conventional index are least correlated with Bahrain Bourse All Share Index.

Table 2: Correlation analysis

	SPSHG	SEMGGCPD	BHSEASI	KWSEIDX	MSM30	DSM	SASEIDX	ADSMI
SPSHG	1.0							

	SPSHG	SEMGGCPD	BHSEASI	KWSEIDX	MSM30	DSM	SASEIDX	ADSMI
SEMGGCPD	0.9	1.0						
BHSEASI	0.2	0.2	1.0					
KWSEIDX	0.4	0.4	0.3	1.0				
MSM30	0.3	0.4	0.2	0.3	1.0			
DSM	0.4	0.5	0.2	0.3	0.4	1.0		
SASEIDX	0.6	0.7	0.1	0.2	0.3	0.3	1.0	
ADSMI	0.4	0.5	0.2	0.3	0.5	0.5	0.4	1.0

The Islamic indices tend to be highly correlated with their conventional counterparts which mean that they provide investors with Shariah-compliant alternatives of a wide variety of popular benchmarks. The results for Skewness, kurtosis, Jarque-Bera, and the correlations are in conformity with the findings of Miniaoui [13] which states that all returns are skewed to the left, which indicates negative skewness of returns and that Jarque-Bera normality test statistics show that the weekly returns are not normally distributed at 5% significance level.

Stationarity Test

To check for stationarity of the selected data series, this research employs the Dickey-Fuller unit root test that clearly shows the distributions of market returns are stationary at level. The results are shown in Table 3. Therefore, this study positively rejects the null hypothesis which states that the series has a unit root. There is no evidence of long-term correlation among the indices.

Table 3: Stationarity test

Islamic and Conventional Indices	Stationarity of Series at Level		Islamic and Conventional Indices	Stationarity of Series at Level	
	ADF Test	Stationarity		ADF Test	Stationarity
SPSHG	-47.20***	Yes	MSM30	-28.46***	Yes
SEMGGCPD	-45.58***	Yes	DSM	-40.79***	Yes
BHSEASI	-40.53***	Yes	SASEIDX	-38.19***	Yes
KWSEIDX	-38.22***	Yes	ADSMI	-37.85***	Yes
Note: *, **, *** Statistically significant at the 10%, 5% and 1% significant level					

Volatility-adjusted Performance

Risk premium which is the numerator in the Sharpe Ratio equation, is calculated by subtracting yearly deposit rates for each country as the risk-free rate from the average yearly returns for each index. For the two proxies, the average of deposit rate of GCC countries is used. The denominator is the yearly standard deviation of the returns.

The result in Table 4 implies that the application of ethical screens does not have an adverse impact on the S&P Islamic GCC index performance. The S&P Islamic GCC provides a very similar return to its conventional counterpart. To sum up, the findings reject the assumption that ethical investing offers inferior

investment performance compared to unscreened portfolios which is similar to the findings Hussein [6], Ahmad and Ibrahim [20] and Hussein et al. [21].

Table 4: Performance and ranking of the indices

Index	Sharpe	Rank
SPSHG	0.01602	7
SEMGGCPD	0.02449	6
BHSEASI	0.05075	4
KWSEIDX	0.00334	8
MSM30	0.03955	5
DSM	0.06774	3
SASEIDX	0.08193	1
ADSMI	0.06974	2

OGARCH Model

Results for OGARCH employing different factor volatility model are shown in Table 5. All the coefficients are significant at 1% significance level except of the Bahraini index which is significant at 5% significance level and that the sum of the ARCH and GARCH coefficients ($\alpha + \beta$) is approaching unity, indicating that volatility shocks are highly persistent. For TGARCH, all indices except for Bahrain, the coefficient of the (RESID<0) $*$ARCH (1), γ term is positive and statistically significant, meaning there are asymmetries in the news. Specifically, bad news has larger effects on the volatility of the series than good news.

The EGARCH that for all indices except for Bahrain, the coefficient of the RES/SQR[GARCH] (1), γ term is negative and statistically significant, indeed for the indices, bad news has larger effects on the volatility of the series than good news. The coefficient for leverage effects in the output is significantly different from zero at 1% level, indicating that asymmetric effects exist. When asymmetry term is negative, this implies that negative shocks have a greater impact on volatility rather than the positive shocks of the same magnitude.

Table 5: Estimation results (1,1)

		SPSHG	SEMGGCPD	BHSEASI	KWSEIDX	MSM30	DSM	SASEIDX	ADSMI
GARCH	α	0.0915***	0.1030***	0.2123**	0.1417***	0.1961***	0.1848***	0.1844***	0.2142***
	β	0.8997***	0.8835***	0.6545***	0.8195***	0.7908***	0.7943***	0.7933***	0.7524***
TGARCH	α	0.0574***	0.0673***	0.2031**	0.0836**	0.1839***	0.1531***	0.1374***	0.1748***
	β	0.8907***	0.8727***	0.6273**	0.8120***	0.7881***	0.8043***	0.7822***	0.7704***
	γ	0.1035***	0.1014***	0.0483	0.1259***	0.0662**	0.1033**	0.1468***	0.1104***
EGARCH	α	0.2053***	0.2270***	0.3955***	0.2969***	0.3639***	0.3415***	0.3245***	0.3912***
	β	0.9839***	0.9734***	0.8229***	0.9267***	0.9704***	0.9605***	0.9531***	0.9506***
	γ	-0.0829***	-0.0874***	-0.0261	-0.0950***	-0.0341**	-0.0521***	-0.0927***	-0.0446***

Note: *, **, *** Statistically significant at the 10%, 5% and 1% significant level

The OGARCH (1,2), (2,1) and (2,2) share the same results with OGARCH (1,1) which supports the findings. The results are shown in Table 6, which

highlight that the S&P GCC Shariah index exhibits similar attributes to the S&P GCC index in the analysis. Volatility persistence is evident in both Islamic and conventional indices, whereby, α+β is close to unity. This affirms that S&P GCC Composite Shariah has similar risk profile as its conventional counterpart. Diagnostics checks reveal lack of serial correlation in the residuals. This is shown in Table 7, the Durbin-Watson statistics for serial correlation, which is close to 2 in the Islamic and Conventional Index.

Table 6: Higher Order Estimation results

		Islamic Index	Conventional Index	Islamic Index	Conventional Index	Islamic Index	Conventional Index
		(1,2)		(2,1)		(2,2)	
GARCH	α1	0.1511***	0.1562***	0.1721***	0.1092***	0.1996***	0.2174***
	α2	-0.0733**	-0.0642			-0.0391***	-0.0285**
	β1	0.9151***	0.8962***	0.1519***	0.1549***	0.2107***	0.1994***
	β2			0.6748***	0.6297***	0.6276***	0.6086***
TGARCH	α1	0.0724	0.0937**	0.0951***	0.1146***	0.0369***	0.1572***
	α2	-0.0151	-0.0277			0.0281**	-0.0566***
	β1	0.8935***	0.8782***	0.1431**	0.1453***	0.2744***	0.1716***
	β2			0.6732***	0.6361***	0.6011***	0.6195***
	γ1	0.0979**	0.0933**	0.1738***	0.1797***	0.3083***	0.1479***
	γ2					-0.1874***	0.0406***
EGARCH	α1	-0.1291***	-0.1521***	0.3141***	0.3403***	0.2924***	0.3279***
	α2	0.2547***	0.2564***			0.0371	0.02085
	β1	0.9857***	0.9744***	0.6885***	0.6118***	0.2543***	0.3322***
	β2			-0.1248***	-0.1261***	0.7225***	0.6285***
	γ1	-0.0761***	-0.0843***	-0.0289***	-0.0249***	-0.2157***	-0.2383***
	γ2					-0.1297***	-0.1283***
Note: *, **, *** Statistically significant at the 10%, 5% and 1% significant level							

Table 7: Durbin-Watson stat

SPSHG	SEMGGCPD	BHSEASI	KWSEIDX	MSM30	DSM	SASEIDX	ADSMI
1.75	1.68	1.46	1.36	1.26	1.47	1.35	1.34

To sum up, the results for the GCC Islamic index do not differ significantly from the conventional GCC indices. Volatility estimates as measured by the model suggest that some of the GCC indices and the Islamic index, are volatile by nature and the financial crisis has not led to exaggerated volatility in these markets. These results are in agreement with Nekhili and Muhammad [22] who found evidence of high volatility spillovers persistence in all GCC markets.

This study is in conformity with El Khamlichi et al. [5] and Miniaoui [13] who have concluded that both Islamic and conventional indices have the same level of high volatility. The results are also in contrast to Rizvi [2] and Al-Zoubi and Maghyereh [9], where they suggest that the Islamic index is less risky than the conventional index.

The finding regarding Bahrain index is similar to the findings of Miniaoui [13], which is that the financial crisis impacted on the mean returns of Bahrain, while the other indices remained unaffected by the crisis and that they are inherently volatile. Khalifa et al. [23] suggest that an underlying cause of volatility in the GCC markets is the changes in the oil price.

CONCLUSION

This research examines the performance of S&P GCC Composite Shariah Index against its conventional counterpart and the GCC markets using daily return for the period of April 2007 to March 2018. SPSHG includes 185 securities of the large market capitalization, while, SEMGGCPD include 290 securities. The largest allocation is for Saudi Arabia and this is the justification for the similar movements between SPSHG and the Saudi Index. The primary objective is to identify if investors who invest in Islamic equity are sacrificing performance or not.

The obtained analyses results reveal that the Islamic index has the highest correlation with the Saudi index. The unit root results reveal that no series have a unit root problem and that all of the indices are stationary at level and therefore, no evidence of long-term correlation among the indices. Moreover, the application of ethical screens does not have an adverse impact on the S&P Islamic GCC index performance and that it provides a very similar return to its conventional counterpart. From a risk perspective S&P Islamic GCC index is ranked the 4th highest risk among the other indices and even riskier than its conventional counterpart and it has been justified for a couple of reasons. OGARCH results highlight that the S&P GCC Shariah index exhibits similar attributes to the S&P GCC index and some of the GCC countries in the analysis. Volatility persistence is evident in both Islamic and conventional indices. Finally, this study positively concludes that S&P GCC Composite Shariah has similar risk profile as its conventional counterpart and that investors who wish to invest in Islamic securities are not significantly worse off than those who choose non-Islamic securities and will not sacrifice financial performance.

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