Volatility of Regional Sharia Compliance Returns and US News Impact

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US News, Volatility, Sharia Compliance Indices, Leverage Effect

Abstract   *Investigation of the impact of US News proxy on the returns of regional sharia compliance indices and volatility is the primary aim of this study. The daily data of Dow Jones Islamic index (DJII), Jakarata Islamic Index (JKII), Karachi Meezan Islamic Index (KMI) and Standard & Poor 500 stock index has been taken for the period of July 01, 2013 to June 30, 2018. GARCH (1,1) is extended with US News proxy for KMI, DJII and JKII. US news proxy identifies that leverage effect reveal the long run persistency in volatility. EGARCH (1,1) model indicates that higher volatility has bee also increased by bad news than good news due to leverage effect in sharia compliance returns. This study leads to extend various assets pricing models by modeling the volatility and will also inform the international and regional investors about the new trends of investment in Islamic stock indices and portfolio diversification.*

Introduction

Financial and economic news are generally believed to have an impact on stock returns. It is also believed that there exist latent relationship between the level and size of the news and stock price movements. Good financial news has different magnitude than bad news. However, it is seen that news sentiment is rarely touched to visualize the series of mapping from the news patterns to the price movements.

Efficient Market Hypotheses elaborates that when the new information comes in market then stock market quickly responds, so the stock market contains the sum of all stock market investors' views at a given time period. So it is said a market is an efficient market and hence exist no predictability (Fama, 1965). This

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theory also narrates that the stock market gives the total availability of information and choices of traders and investors. If the information is wrong, the traders and investors may move their investments in wrong direction. The best opportunities in stock markets come when it is wrong temporarily. The rationale investor in stock markets will identify the difference and will be benefited by arbitrage. However the relevancy of size of the impact of news is still a continuous phenomenon and demands to visit the dilemma of good and bad news.

The word "volatility" means "statistical measurement of fluctuation in prices and returns of different financial instruments (bonds and stocks markets indexes) of International financial markets". By taking two indexes or securities, one is said to be riskier if its level of volatility is higher than other. In this case the average investor is considered to be a risk averse, because higher volatility often loses the confidence of the investor.

From the last two decades, economic integration has been increased among global financial markets. Increasing incapital flow and development of technology among different countries are the main factors which affecting the international financial markets. Understanding of these factors and linkages among different financial markets is very important for average investors, portfolio managers and financial institutions because these factors and linkages from one market to other market are the major threats of financial crises in global economies. The main reason of these financial crises is the attainment of higher return having the higher risk due to natural phenomena "high risk, high returns". When these crises originate in the developed economies then they not only affect their own economies but they affect the different developing and emerging economies also. In 2007-2008 subprime financial crises that came in USA affected the global stock markets severely.

The Islamic stock markets have different features than the conventional emerging equity markets and the markets of developed nations. Therefore, the profile of risk and return is relatively higher in Islamic stock markets of emerging economies than developed economies due to different economic and political structure which support the fast growth of Islamic finance and the investors' interest in Islamic investments. Therefore, there is a dire need to investigate the risk or volatility in the sharia stock indices and to check the impact of US News on sharia stock indices. Here, it is very essential for investors to know about the sharia stock indices in their investment decisions. Basically the sharia stock indices consist of such type of stocks which are free from *riba*, pork, pornography, intoxicants and gambling etc.

The study is significant because there is an increasing trend in the portfolio investment composed of sharia stock indices rather than conventional stock indices and will provide investment guide to the regional and International investors and investing agencies to invest in the sharia stock indices due to high performance and portfolio diversification opportunities. Therefore the main objective of this

study is to investigate the impact of US news proxy on the sharia compliance indices returns. Secondly, it aims to investigate the risk or volatility in the sharia stock indices and to check the impact of US News on sharia stock indices. Moreover, it will to identify the impact of good news and bad news on the returns of sharia compliance indices.

This research paper consists of five subsections. The first section consists of introduction and the second section is composed of review of the literature. Data and methodology are discussed in third section. Empirical results and discussions are described in fourth section. Finally, conclusion is discussed in fifth section.

Review of the Literature

Mian and Sankaraguruswamy (2012) examined the news impact regarding the stock price sensitivity to firm-specific earnings news. These news sentiments provide signals to the investors and the behavior of market dynamics are impressed by the effect of good news. Mispricing may occur due to investors' sentiments as well. They focused on the influence of investors sentiments on the volatility that how earnings news creates hypes and they confirmed that sentiments leads volatile behavior and further identified that good earnings news are sensitive to stock prices is greater during the periods of high sentiments in comparison to the low sentiment periods.

Sukmana and Kholid (2012) investigated the dynamics of conventional and sharia stock indices, risk performance and their comparison during the period of global financial crisis as well as post period and provided guidelines for the investors of emerging economies regarding their investment decisions. The data of this study consisted of daily stock prices from January 2001 to December 2009 of Jakarta Islamic and Composite Indices of Indonesia. They concluded that JCI is riskier than investing in JAKISL.

Kishor and Singh (2014) examined the impact and relationship of emerging economies (BRICS) stock return volatility from 2007 to 2013 including the period of financial crisis 2008. For empirical analysis, GARCH model is also used. The results of this study indicated that Chinese and Brazil stock markets have no significant impact than other markets of BRICS countries on stock return volatility.

Li and Giles (2015) concluded that volatility spillovers effect has a shock in a unidirectional manner from USA stock market to the other selected stock market exists. They also investigated that volatility spillovers is bidirectional and stronger among selected stock markets except Japanese stock market in the financial crises period of Asia. It is identified that shocks make effect on the stock market in unidirectional as well as in bidirectional manner. However, the level of shock may arise in the period of financial crises due to bad news effect phenomena.

Hamid and Hasan (2016) identified the performance of volatility and returns along with the aspects of asymmetric patterns and non-linearities in the KSE stock

returns and volatility modeling for asset pricing along with macroeconomic, semi-variance and Value at Risk in the specification of GARCH. GARCH- in- mean model is also used for volatility modeling with the extension of macroeconomic variables in mean and variance equation also. The results of this study showed the significant negative impact of change in interest rate on stock returns and stock returns are also decreased by increasing the changing in interest rate. There was a significant positive effect of oil prices changes on KSE returns. The findings of this study also showed that interest rate has a significant positive relation to the volatility and the impact of change in oil prices on volatility is significantly negative. Moreover in mean as well as in variance equations, the model of GARCH (1,1) is also extended with Sami-variance for Karachi Stock Exchange (KSE) and Value at Risk also. The results showed the significant sami-variance and negative impact of downside risk as well as significant negative relationship of Value at Risk to KSE returns. At the end the results of this study also indicated the non-linear trend of volatility on returns.

Pranata and Nurzanah (2016) investigated the volatility and performance of conventional and Islamic stock indices of Indonesia with those variables which have contributing effect. This research focused on firstly, Capital Asset Pricing Model which was used to check the difference between the performance of conventional stock index like LQ45 and Jakarta Islamic Index. Secondly, this study focused on the calculation of beta to volatility measurement and finally, it focused on calculation of Autoregressive Distributed Lag Model to check the contributing effect of the considered variables and their outperformance reasons. For this study the sample data is taken from 2006 to 2015. The results of this research investigated that Jakarta Islamic Index and conventional stock index like LQ45 have no significant performance difference, LQ45 is more volatile than Jakarta Islamic Index instead of in 2010and the external factors instead of crude oil price have the less effect on the performance of Jakarta Islamic Index.

Narayan and Bannigidadmath (2017) investigated that whether financial markets news predicted the returns of sharia compliance stock than non- sharia compliance stocks. The results of this study showed that positive words have significant impact on sharia compliance and non- sharia compliance stocks returns and the shock from financial markets news to returns only reverses in portion for some financial market stocks. The results of this study also indicated that to invest in sharia compliance stock is more profitable as compare to non-sharia compliance stock. Djedoria and Ergun (2018) investigated the volatility spillover among Dow Jones Islamic index of UK and Dow Jones conventional index of UK. Monthly data is taken from the period of January 2010 to June 2017. Impulse response functions and Vector Auto-regression model were also used to check the impact. The findings of this study indicated that Dow Jones conventional index of UK had a significant impact on Dow Jones Islamic index of UK volatility.

Data and Methodology

The data of this study consists of daily stock prices of three sharia stock market indices. Stock Prices for Dow Jones Islamic index (DJII), Jakarata Islamic Index JKII and Karachi Meezan Islamic Index (KMI) have been taken for the period 1st July, 2013 to 30th June, 2018 by viewing the fast growth of Islamic finance and the investor's interest in Islamic investment. To calculate the returns (R_t) of daily stock prices the following model is also used.

$$R_t = \ln(P_t/P_{t-1}) \qquad\qquad (1)$$

Where R_t is the return for the given time period 't', P_t is the closing value of daily stock prices , P_{t-1} is the closing value of previous day stock prices and "ln"denotes natural log. Moreover, KPSS unit root test is used to test stationary of the time series and the presence of heterosecdasticity is tested through Lagrange Multiplier (LM) Test. To estimate stock price volatility GARCH (1,1) by Bollerslev (1986) is used. This model pretends the conditional variance at lag values of its own historic shocks. GARCH model has the capacity to extend with the set of information that may capture the volatility in a more dynamic way Asteriou and Price (2001); Hamid and Hasan (2016). The following equation is also expressing the GARCH (1,1) model:

$$y_t = a + \sum_{i=1}^{r} \beta_i \, y_{t-1} + \varepsilon_t \qquad\qquad (2)$$

$$\varepsilon_t \mid I_{t-1} \sim \ N(0, h_t)$$

$$h_t = a_0 + \sum_{i=1}^{p} a_i \, \varepsilon_{t-1} + \sum_{i=1}^{p} \phi_i \, h_{t-1} \qquad\qquad (3)$$

Model 2 show the conditional mean equation which is modeled as an autoregressive process. The residuals (ε_t) are not correlated serially. We add the US News the mean and variance equation, the values of US News series are also calculated through residual series after testing the impact of S&P 500 returns at prior day on today return along with calculating the square of residual series also. Furthermore to check the long run volatility persistence, leverage effect existence and phenomena of good and bad news Exponential GARCH (EGARCH) model is also used which is presented by Nelson (1991). EGARCH (1,1) model can be expressed in the following manner:

$$\log(\sigma_t^2) = \Upsilon + \sum_{i=1}^{p} \Upsilon_j \left| \frac{\varepsilon_{t-j}}{\sigma_{t-j}} \right| + \sum_{i=1}^{q} \Im_i \log(\sigma_t^2) + \sum_{i=1}^{k} \ddot{K}_k \frac{\varepsilon_{t-k}}{\sigma_{t-k}} \qquad\qquad (4)$$

For the calculation of conditional variance $\Upsilon \; \Im_i \; \ddot{K}_k$ are the parameters in above equation. $\Im_i$ shows the impact of the measurement of period prices on conditional variance. Υ_j coefficient calculate the effect of previous time period information and

finds the impact of earlier standardized residuals on the existing volatility. The $\ddot{\text{к}}_k$ term shows the impact of bad and good news.

Empirical Results and Discussion

Table 1. KPSS unit root test for DJII, KMI and JKII sharia stock indices

Sr. No.	Indices	At 1st difference	Critical values			
		KPSS test stat	Level 1%	Level 5%	Level10%	DW stat
1	DJII	0.0952	0.7390	0.4630	0.3470	1.6950
2	KMI	0.0868	0.7390	0.4630	0.3470	1.7281
3	JKII	0.0585	0.7390	0.4630	0.3470	2.0023

Table.1 indicates that there is no unit root exists in above all considered indices. The values of KPSS test statistics of all the above said indices are also less than the critical values at first difference which prove that data is stationary and the values of Durbin Watson statistics show that model is fit.

Table 2. Heterosecdasticity Test for DJII, KMI and JKII sharia stock indices

F-stat	31.6972	Probability F(3,719)	0.000
Observed R^2	84.4514	Probability. χ^2	0.000
SS	229.7956	Probability. χ^2	0.000

Table 2 indicates the heterosecdasticity test for DJII, KMI, and JKII sharia stock indices. The results of this test show the significance values which means that the heterosecdasticity exist in the sharia compliance indices returns.

Table 3. Lagrange Multiplier Test (Breusch-Godfrey) for DJII, KMI and JKII sharia stock indices for Serial Correlation.

1	**DJII**	F-Stat	2.3001	Probability. F(2,720)	0.1010
		Observed R^2	4.5963	Probability. χ^2	0.1004
2	**KMI**	F-Stat	0.1809	Prob. F(2,720)	0.8346
		Observed R^2	0.3635	Probability. χ^2	0.8338
3	**JKII**	F-Stat	0.2021	Prob. F(2,717)	0.8170
		Observed R^2	0.4063	Probability. χ^2	0.8162

Table.3 Indicates Serial Correlation Lagrange Multiplier Test (Breusch-Godfrey) for DJII, KMI, and JKII sharia compliance indices and results of this test shown that all the *p* values are significant and no residual autocorrelation exist in the model.

Table 4. GARCH (1,1) model for KMI

Dependent Variable: KMI				
Method: ML - ARCH				
Mean Eq.				
Variable	Coef.	S.E	Z-Stat.	Probability
C	0.0008	0.0004	2.2420	0.0250
KMI(-1)	0.1701	0.0366	4.6420	0.0001
US News(-1)	-0.0753	0.0448	-1.6831	0.0924
Var. Eq.				
Constant	0.0000	0.0000	4.3831	0.0000
ε_{t-i}^2	0.1162	0.0219	5.3097	0.0001
σ_{t-j}^2	0.7948	0.0358	22.2190	0.0001
US News(-1)	0.0009	0.0003	2.5391	0.0111
R^2	0.0198			
D-W	2.0482			

Table 4 indicates the findings of GARCH (1,1) model for KMI. These results show that current volatility is influenced by previous stock price behavior in case of ARCH term as well as GARCH term. Further results provide evidences regarding to the presence of persistent volatility. Both ARCH and GARCH terms are significant at p<0.01. Moreover the US News has a negative significant impact on the KMI stock market return in mean equation and has a positive significant impact on the KMI stock market return while adding in the variance equation.

Table 5. GARCH (1, 1) model for DJII

Dependent Variable: DJII				
Method: ML - ARCH				
Mean Eq.				
Variable	Coef.	S.E	Z-Stat	Probability
Constant	0.0006	0.0002	3.1529	0.0016

DJII(-1)	0.1830	0.0350	5.2247	0.0001
US News(-1)	0.0122	0.0250	0.4867	0.6264
Var. Eq.				
Constant	0.0000	0.0000	5.0903	0.0000
ε_{t-i}^2	0.1306	0.0155	8.4260	0.0001
σ_{t-j}^2	0.8378	0.0168	49.9016	0.0001
US News(-1)	0.0000	0.0001	0.4035	0.6866
R^2	0.0223			
D-W	2.0454			

Table 5 indicates the results of GARCH (1, 1) model for DJII. Findings reveal that current volatility is influenced by previous stock price behavior in case of ARCH term as well as GARCH term results show the presence of volatility persistence. Moreover, the results of this table also show that US News has not a significant effect on the DJII returns in mean and variance equation also. Further results reveal that current volatility is influenced by previous stock price behavior in case of ARCH term as well as GARCH term. However, the results show the presence of volatility persistence. Moreover, the results of this table also show that US News has a significant effect on the DJII returns in mean equation but not in variance equation.

Table 6. GARCH (1,1) model for JKII

Dependent Variable: JKII				
Method: ML - ARCH				
Mean Eq.				
Variable	*Coef.*	*S.E*	*Z-Stat.*	*Probability*
Constant	0.0002	0.0004	0.4342	0.6642
JKII(-1)	-0.0184	0.0329	-0.5588	0.5763
US News(-1)	0.1044	0.0496	2.1060	0.0352
Var. Eq.				
Constant	0.0000	0.0000	3.8889	0.0001
ε_{t-i}^2	0.0582	0.0084	6.9376	0.0001
σ_{t-j}^2	0.9183	0.0113	81.3849	0.0001

US News(-1)	-0.0003	0.0003	-1.0604	0.2890
R^2	0.0018			
D-W	1.9682			

Table 6 indicates the results of GARCH (1, 1) model for DJII. Here results also indicate that current volatility is influenced by previous stock price behavior in case of ARCH term as well as GARCH term results show the presence of volatility persistence. Moreover the results of this table also show that US News has a significant effect on the DJII returns in mean equation. However by adding US News in variance equation no significant results have been driven.

Table 7. EGARCH (1, 1) Model for DJII, KMI and JKII of sharia Compliance Indices and US News

Mean Eq.				
Parameters	**DJII**	**KMI**	**JKII**	**US News**
∅	0.0003	0.0003	-0.0001	0.0000
p-value	0.0909	0.3586	0.7700	0.9346
β	0.1655	0.1654	-0.0287	0.1501
p-value	0.0000	0.0000	0.3542	0.0000*
Var. Eq.				
Parameters	**DJII**	**KMI**	**JKII**	**US News**
ϒ	-0.6022	-0.8530	-0.1279	-0.3465
p-value	0.0000	0.0000	0.0000	0.0000*
$ϒ_1$	0.1496	0.1290	0.0423	0.0253
p-value	0.0000	0.0000	0.0002	0.0496**
$ҙ_1$	-0.1751	-0.1861	-0.0660	-0.2021
p-value	0.0000	0.0000	0.0000	0.0000*
$ӝ_1$	0.9512	0.9153	0.9892	0.9672
p-value	0.0000	0.0000	0.0000	0.0000*
R-Squared	0.0238	0.0178	-0.0011	0.0243
Durbin-Watson stat	2.0121	2.0398	1.9809	1.9421

*Significan at p<0.01**Significan at p<0.05*

Table 7 indicates the results of EGARCH (1, 1) model for DJII, KMI, JKII and US News of sharia compliance indices. The results of variance equation show that ARCH term is significant positively at p< 0.01 and GARCH term coefficient is also negatively significant at p<0.05 for all the Sharia compliance indices. The significant positive values of $Ж_1$ show the long run volatility persistence and leverage effect existence. The results of this model also show that higher volatility is also increased by bad news than good news due to the significant of leverage effect $Ж_1$ in all above said sharia compliance indices returns.
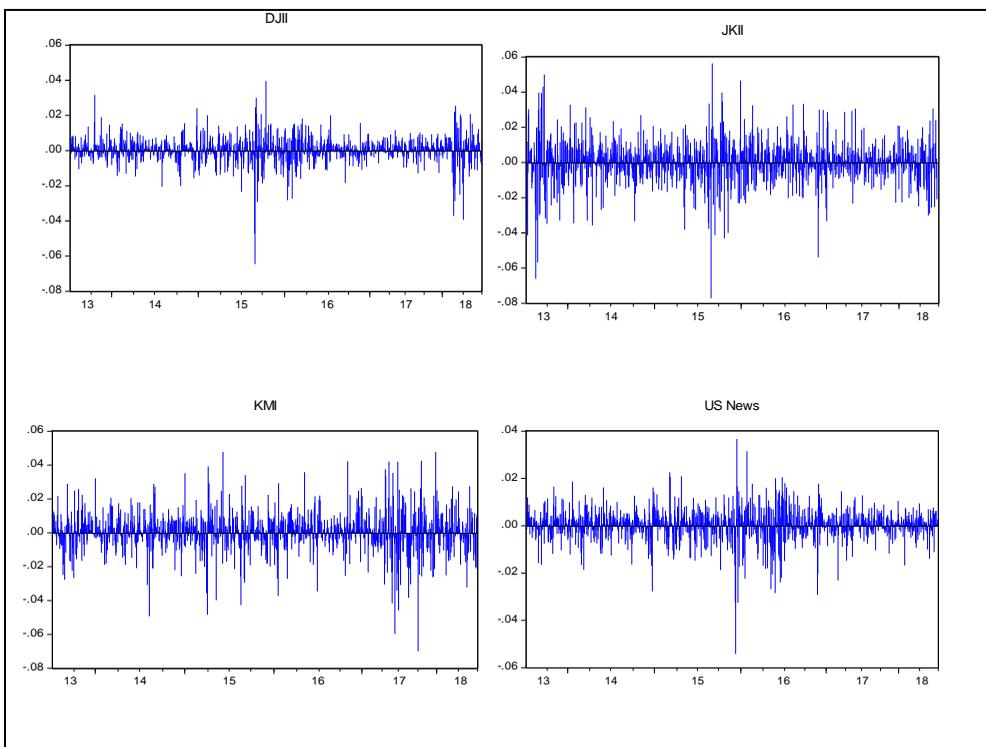

Figure 1: Volatility of DJII, JKII, KMI Sharia Indices Returns and US News Stock Index Returns

Figure 1 indicates that during the sample period smaller and larger volatility shocks exist in KMI, DJII and JKII market returns as well as US News stock returns. From the period 2015 to 2018 the stock returns volatility is relatively high than other period for DJII sharia returns. For JKII sharia index the stock return volatility is also higher from 2013 to 2015 than the whole sample period as well as the stock return volatility of KMI sharia index which is also more volatile and highest in the whole sample period than the DJII and JKII sharia indices returns and indicating

the significant effect of US News. The volatility of US News is very high between the time period of 2015 and 2016 and also highest among the than the whole sample period. It is seen that volatility cluster exists and higher volatility follow lower period volatility and vice versa.

Conclusion

A lot of research works have been performed to examine the relationship among the volatility and returns of stock markets of developed countries and emerging economies as well but Islamic indices interaction with global factors have not been yet studied deeply. Therefore, by viewing the fast growth of Islamic finance and the investor's interest in Islamic investment in this era. There was a dire need to investigate the risk or volatility in the sharia stock indices and to investigate the impact of US News on Sharia compliance stock indices regionally and globally. The data of this study consist of daily stock prices of three sharia stock indices. The stock prices of Dow Jones Islamic index (DJII), Jakarata Islamic Index (JKII), Karachi Meezan Islamic Index (KMI) and S&P 500 have been taken the period July 2013 to June 2018. Hence the values of KPSS test statistics of all the said indices are also less than the critical values and results conclude that the data have the proper of stationarity at   first difference. The pattern of returns has been identified that there exist minor positive and negative serial autocorrelation as the DW is not exactly equal to 2. However, Heterosecdasticity test for DJII, KMI, and JKII sharia stock indices results show the significant values which means that the heterosecdasticity prevails in the Sharia compliance indices returns. Moreover the Breusch-Godfrey Serial Correlation Lagrange Multiplier (LM) test results show that all the *p* values are significant for DJII, KMI, and JKII sharia compliance indices and hence reflect that no residual autocorrelation exist in the model. The testing of GARCH (1, 1) model in a mean equation as well as in variance equation elaborate the volatility effects of its own past shocks as well as innovation and leverage effect. The results concluded that the volatility is persistent phenomenon and the GARCH model has the capacity of extend with the new set of information. We used US news as an extended variable in mean equation thereafter in variance equation as well.

GARCH (1, 1) concluded that the volatility is influenced by previous stock price behavior and results show the presence of persistency in volatility with asymmetric patterns. Moreover, the results also show that US News has a negative significant impact on KMI stock market return in mean equation and has a positive significant impact on KMI stock market return in variance equation. US news proxy identifies the leverage impact and the news impact curve has the ability to visualize the asymmetric patterns. In case of JKII there is a significant impact of US News on JKII stock market returns than DJII stock market returns in mean and variance equation. The results coincide with the studies of Asteriou and Price

(2001) and Hamid and Hasan (2016) but have different argument than the sentiment study of Mian and Sankaraguruswamy (2012).

The results of EGARCH (1, 1) model show that in the variance equation ARCH term coefficient is positively significant and GARCH term coefficient is also negatively significant in the all above said sharia compliance indices. The significant positive values of leverage effect coefficient show the long run volatility persistence and leverage effect existence. The results of this model also show that higher volatility is also increased by bad news than good news due to the significant of leverage effect in all above said sharia compliance indices returns. The results are also in line with the study of Narayan and Bannigidadmath (2017) in a different manner. This study will be helpful for investment agencies, international and regional investors, financial decision makers and banks related to the trends of the Islamic stock markets, funds management and portfolio diversification. Event studies and extension of GARCH model can be modeled for better asset pricing.

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