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INTERNATIONAL CONFERENCE ON

# ISLAMIC FINANCE

THEME:

ISSUES, CHALLENGES AND FUTURE PROSPECT OF ISLAMIC BANKING AND FINANCE

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بسم الله الرحمن الرحيم

PROCEEDINGS

5TH ASEAN'S INTERNATIONAL CONFERENCE ON ISLAMIC FINANCE

(AICIF)
VOLUME 1

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EDITED BY

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PREFACE

بسم الله الرحمن الرحيم

السلام عليكم ورحمة الله وبركاته

The 5TH ASEAN'S INTERNATIONAL CONFERENCE ON ISLAMIC FINANCE (AICIF) was jointly organized by Universiti Islam Sultan Sharif Ali and Co-partners (Universiti Islam Antarabangsa, Malaysia; Universitas Islam Negeri Sunan Kalijaga, Jogjakarta, Indonesia; Universitas Islam Sultan Agung, Semarang, Indonesia; Universitas Darussalam Gontor, Indonesia; Mindanao State University of Philippines; Universiti Fatoni, Thailand) convened at Parkview Hotel, Jerudong, Brunei Darussalam on 13-14 December 2017. The conference centred on six sub-topics, namely, capital market, compliance and governance, Islamic banking, Islamic social finance and Islamic economics.

The 5th AICIF was guided by the three pillars under the vision of ASEAN: A Community of Opportunities that are, ASEAN Political-security Community, ASEAN Economic Community (AEC) and ASEAN Socio-cultural Community. AEC envisions ASEAN as a single market and production base, a highly competitive region, with equitable economic development, and fully integrated into the global economy. AEC can be realized, if ASEAN moves towards free movement of goods, services, and investments as well as freer flow of capital and skills. A free movement of services means that Islamic finance has an important role in realizing such goals.

The discussion on capital market highlighted the instruments that are traded in those market such as mutual funds, shares and sukuk. The discussion also highlighted that capital markets are increasingly interconnected in a globalized economy.

The sub-theme on compliance and governance raised the issues of having a good governance and a complaint based Islamic financial institutions. Both are important to have an impact on the transparency of the guidelines and the performance of Islamic financial institutions.

There are several issues that were reported by several papers in this conference on Islamic banking. Among the issues are: the future demand for Shariah-compliant financial services which remains bright, an effort to establish a complete set of eco-system in Islamic finance that comprises halal products and services, green environment and maqasid shariah, bridging Islamic financial literacy and halal literacy: The way forward is to create a Halal Ecosystem.

The discussion on Islamic social finance covered three main instruments namely waqf, zakat and microfinance. These instruments were recognized as tools to help in realizing the objectives of socio-economic development. The sub-theme on Islamic economics mooted the idea that Islamic finance leads to development. Islamic finance had grown in response to demand or supply. Both might boost the development of Islamic finance (e.g. demand for Islamic financial services and supply of funds for helping the economic development).

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Chief Editors

ANALYSIS OF MOVEMENT AND SHARIA SHARE VOLATILITY ON RAMADHAN MONTH USING ARCH / GARCH MODEL

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ABSTRACT

Capital markets always face a dynamic and uncertain situation. The uncertainty occurs because the actors in the capital market are easy to enter or exit the market. Investors expect a high return despite facing a higher level of risk than placing their funds in the money market. This causes a fluctuation in stock prices or known as volatility. The high volatility signifies the high risk of investment in the capital market. Volatility in the Indonesia stock market in Ramadan is estimated to have different rates compared to other months. It is based on the different behavior or traditions of Indonesian people in the month of Ramadan. In addition to running Ramadhan religious activities, the community behavior also tends to be more consumptive, especially when it is ahead of Idul Fitri holiday because it is usually also followed by mudik, a hometown returning tradition. This study aims to find out whether Ramadhan affects the movement of Sharia Stock Index i.e. the Jakarta Islamic Index (JII) and analyzes the difference of volatility and risk level of some of the stocks which includes to JII group, that is between those vulnerable to the effect of Ramadan and those who are not. The study period was from January 2011 to July 2017. Daily time series data were obtained from the website www.google.finance.com or www.yahoo.finance.com as well as some other information from the company's fina#ncial statements. The data analysis was conducted using ARCH-GARCH model because this model is more appropriate for time series data which on average have some problems in correlation and inconstant variance. The test was done with Eviews.9

Keywords: Share Movement, Share Volatility, Sharia Share, Ramadhan Month, ARCH/GARCH

Introduction

Capital markets always faces a dynamic and uncertain situation. The uncertainty occurs because the actors in the capital market are easy to enter or exit the market. Investors expect a high return despite facing a higher level of risk than placing funds in the money market. Shares are one of the attractive investments for investors in the capital market.

Stock price index as one of the guidelines in investment is necessary for investors to determine the investment strategy. The stock index is divided into two i.e. sectoral and non-sectoral. Non-sectoral indexes are grouped into two, namely sharia index i.e. JII and ISSI, non-sharia index is such as JCI, LQ45 index, IDX 30, etc. By knowing the movement of the index, investors can measure the development of performance in the capital market. Capital markets both conventional and sharia have different risk levels. Stocks as the main instruments traded in the capital market have risk level that tends to be higher than other financial instruments. Here is the chart of the development of stock index during the period of this study:
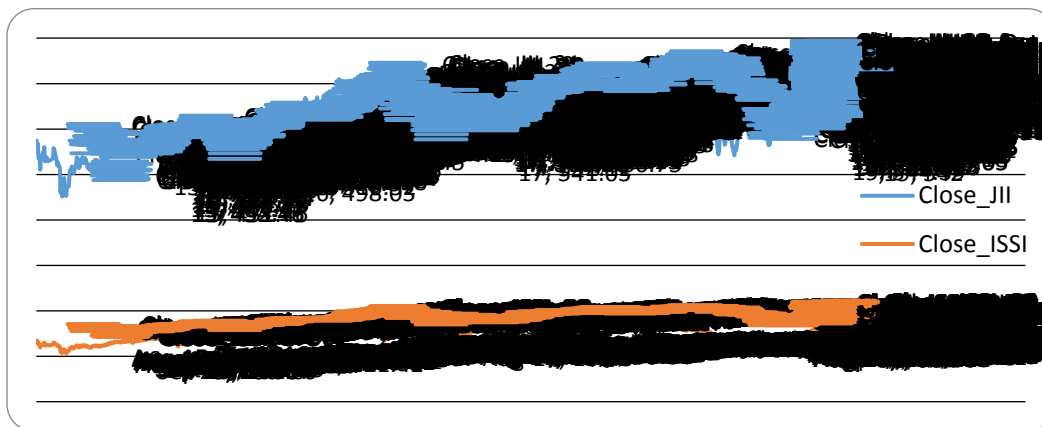
Figure: The Development of JII and ISSI Indexes during 1 August 2011 – 22 June 2017 Period

From the graph above, during the period of August 1, 2011 until June 22, 2017, the value of ISSI is still far below JII, where the index price is still below 200, while JII ranged from 400 to 800. But the movement of ISSI is relatively more stable than JII. The instability of index movement can reflect the risk level of sharia stock market. High risk can be reflected from uncertain returns that will be received by investors in the future. Stock movement in Indonesia Stock Exchange currently shows that the stock price condition is very fluctuative and easily influenced by the economic condition inside or outside a country.

Regarding to capital markets or sharia capital markets, almost all investors know if the risks should be considered in determining values and making investment choices (Aswandi, Anggreyani & Nurfalah, 2014) and every investor who invests in shares has two possibilities i.e. getting capital gains and dividends or otherwise experiencing capital loss and not getting dividends. In principle, investors do not want to take too high risks, when it is viewed from their willingness to take the risk.

The capital market has some information which must be known by investors, one of which is about movement information of up and down of stock or commonly called as volatility. If

investors want to get a good profit in the form of capital gain or dividends then they must understand the volatility that happened so they can take advantage of the effects of such volatility.

Stock volatility needs to be taken into account for investors to find the right strategy so as to obtain a good return. (Sandrasari, 2010). Then, one of the information that must be known by investors before applying their capital is the level of stock volatility. According to (Firmansyah, 2006), volatility is a measure of price fluctuations of a security or commodity during a certain period. Volatility can be measured by standard deviation so that volatility is perceived as a risk by public. The higher the level of volatility, the higher the level of uncertainty for returns which will be obtained by investors.

In certain conditions, there are some players in the capital market who can contribute to the weakness of market efficiency. This is stated by Sukamulja (2011) that investors have information that is not symmetrical, tend to be irrational because of insufficient information, and often overreact to the latest information. The conditions which is in contrary to the efficient market in the capital market reference are known as capital market anomalies. There are several forms of anomalies which may occur in the capital market, including seasonal effects.

Some studies on seasonal anomalies in the capital market have been conducted by previous researchers. Some of them are the studies on January effect in Indonesia conducted, among others (Indah Fitriyani, 2013) who stated that January effect occurs in the banking sector in the capital market. This is not in line with the finding of the study of (Fitri Aprilia Sari, 2014) who stated that there is no January effect in the Indonesian capital market. Another study conducted by (Chan, 1996) showed returns before religious holidays tend to be higher than other holidays. For example, Pre-Holiday Effect of Hindu holidays occurs in India. While in Malaysia, there are significant results before the Islamic New Year and Waisak. Singapore occurs Abnormal Return before Chinese New Year, and large stock returns occur before the Easter holidays in New Zealand. In the Indonesia Stock Exchange, where most of the population is Muslim, during ramadhan month it usually has a different atmosphere compared to other months. In Ramadhan, especially in the last days of Ramadhan. People are usually more consumptive because of their enthusiasm in welcoming Idul Fitri holidays with everything new. The change in behavior is practiced by almost every family in Indonesia. There have been some studies on the effect of Ramadan on the return of investors in the capital market. The study conducted by (Hamed Akrami, 2012) showed the effect of Ramadan where there is a significant difference of abnormal return between before Ramadhan and after Ramadhan month on Tehran Stock Exchange. However, this is not in line with the study of (Suciningtyas, 2016) who tested ramadhan effect on Sharia Stock Index in Indonesia and in Malaysia where no ramadhan anomaly was found.

Most of the ramadhan anomaly testings is done to see the effect on the market return or the return of investors. In this study, it is aimed to test the effect of Ramadhan to the volatility of sharia stock index, namely Jakarta Islamic Index (JII) and Indonesia Sharia Shares Index (ISSI). Furthermore, this study will also analyze the volatility of the two sharia stock indexes during the period of this study, i.e. August 1, 2011 to June 22, 2017.

Literature Review and Hypotheses Development

Capital Market Efficiency

An efficient capital market hypothesis assumes that security prices in the financial market have depicted relevant information in the market. This theory is proposed by Bachelier (1964), Fama (1970) and Jensen (1978) who divide the efficient market in three models or forms i.e. strong, half strong, and weak forms. In an efficient market, the price does not form a certain pattern or more random walk. Investors can not predict future prices based on hitoris price information.

Evidence of efficient market was conducted by Fama (1970) with fair game model. Investors can have confidence that the current stock price has fully reflected all available information about the securities and expected returns based on current prices and is consistent with the level of risk.

Capital Market Anomalies

Anomalies in the capital market occur because there are conditions that contradict the efficient market hypothesis. Inefficient capital markets lead to changes in the price of securities which do not reflect all the relevant information available in quality, time, and perception (Sukamulja, 2003). Anomalies can be found in all forms of efficient markets but are mostly found in semi-strong efficient market form.

Anomalies in the stock market have several types i.e. corporate anomaly, event anomaly, accounting anomaly and seasonal anomaly. (Levy, 1996). Seasonal anomaly includes week-end effect, end of month, seasonal effect, January effect, time of day, and holidays effect.

Seasonal effect or seasonal anomaly shows a consistent and regular pattern at a certain time interval. (Zafar, 2009). Stock prices may rise or fall due to seasonal effects. Investors will achieve a certain abnormal return compared to other periods. This is not in line with the concept of efficient capital market where investors will not gain more profit in the capital market.

Ramadhan Anomaly / *Ramadhan Effect*

Ramadan is a religious tradition of Muslims in the world which can have a different impact on the economy in the real sector as well as the financial sector. Ramadan effect is one form of seasonal anomaly / calendar anomaly in which investors will get a certain return different than the other months. The result of study by (Hamed Akrami, 2012) on the Tehran exchanges showed significant differences in abnormal returns during Ramadhan before and after Eid.

The result of the study by (Seyyed, September 2005) on the Saudi Arabia Stock Market that the six sectors studied, namely banking, cement, electricity, agriculture, and services which use weekly returns indicate a decrease in volatility during Ramadhan except in the electricity and agricultural sectors. But, this result is not significant, meaning that there is no ramadhan effect in the finding of the study.

In Indonesia, the test conducted by (Syarifatul A. S, 2015) who tested Ramadhan effect on the Indonesia Stock Exchange in the Food and Beverages sub-sectors during the period 2013-2014 found that the abnormal return of Ramadhan did not differ significantly with Sha'ban and Shawwal months but trading volume activity (TVA) differs significantly in Ramadan. While the study conducted by (Fransisca Mayarina S.D, 2014) who examined Ramadhan effect on ILQ 45 on the Indonesia stock exchange in 2011 to 2012 found that in 2012 the average abnormal return before Ramadan was greater than after Ramadan. While in 2011 the average abnormal return before Ramadan was smaller than after Ramadan.

Sharia Shares

Sharia shares are proof of capital participation of a person or entity into a company that does not violate the principles of Islamic sharia. Sharia shares have several advantages over conventional shares because to enter into the List of Sharia Securities (DES) groups, there are several criteria regulated by the Financial Services Authority (OJK). The first criterion is seen from the side of products or services made by the issuer which should not violate the provisions of Islamic Sharia and included in the BEI. The second criterion is seen from the issuer's financial statements. Companies that include the category of sharia shares should not have a ratio of total interest-based debt more than 45% of its total assets. In addition, non-legal income received also may not be more than 10% of total revenue. The existence of screening as above will provide a sense of security for sharia stock investors because the risk level becomes relatively smaller compared to conventional stocks.

There are two kinds of assessment of Sharia stock index on the BEI i.e. Indonesia Sharia Stock Index (ISSI) and Jakarta Islamic Index (JII). ISSI is a stock index that reflects the movement of sharia stocks in IDX. ISSI Constituents are all Sharia shares listed on IDX and listed in the List of Sharia Effects (DES). The ISSI Index was launched on May 12, 2011.

JII Jakarta Islamic Index (JII) is a sharia stock index that was introduced since July 3, 2000 to facilitate the trading of public companies that run business according to sharia principles. Shares that include JII are amount to 30 and will be evaluated every 6 months based on financial statements, market capitalization, and sharia principles which are held. JII Constituents are shares that have been included in the ISSI index reviewed based on market capitalization and trade transactions.

Share Volatility

Changes in stock prices as well as stock price indixes have uncertainties. Sometimes they are positive, but sometimes they are negative. To find out how much uncertainty, it is used a measure called volatility. It is regarded as unobservable. One can not know for certain what the true value of volatility is. Therefore, the calculation of volatility is a prediction. Volatility is usually calculated using standard deviations or deviations. As the times progressed, many researchers propose another way to calculate volatility. There are several ways to calculate daily volatility, namely:
1. Realized Volatility
       Volatility can be measured by using the formula below

$$RV_t = \sum_{i=1}^{n} r_{t,i}^2$$

where $r_{t,i}^2 =$ is the quadratic return to-i on trading day-t and n is the number of data. data return is usually used every 5 minutes on day-t trading. This calculation is proposed by Andersen and Bollerslev (1998).

2. Range Based Volatility. There are several ways proposed by some researchers to calculate volatility with this approach, one of which is proposed by Alizadeh et al. (2002).
   Volatility is measured by the formula $V_{s,t} = \ln(Ht) - \ln(Lt)$
   where Ht is the highest price, and Lt is the lowest price on day-t trading.

3. Squared Return. This way is considered as traditional, because it has been used before the first and second ways as stated before.
   The formula of squared return is $V_t = r_t^2$
   Where r_t^2 is a quadratic return on day-t trading.
   Of the three ways has been stated above, the first is the best way, while the third is the most inaccurate (Blair et al. 2001). Volatility is considered unable to be observed so that it needs a comparison (de Vilder & Visser, 2007).

This study employs the second way as daily volatility proxy, as a reference or comparison in error calculation. The selection of the first way can not be done, due to unavailability of data return for every 5 minutes on sharia stock index.

Hypotheses Development

Different behavior of people in Ramadhan month compared to other months is also expected to have an impact on investor behavior in capital market. It can also affect the fluctuation of stock price changes. Volatility is a statistical measure for the fluctuations in the price of a security or commodity for a certain period. The public usually perceives stock volatility or stock index as a risk. The higher the level of volatility, the higher the level of uncertainty of the stock returns that can be obtained.

The hypotheses developed in this study are:
H1: There is an effect of Ramadhan on the Volatility of Sharia Stock Index in Indonesia
H2: There is a difference of volatility in both Sharia Stock Index, i.e. JII and ISSI Indexes.

Method of the Study

The secondary data used is time series data i.e. sharia stock index of JII (Jakarta Islamic Index) sourced from yahoo finance in the period of 1 August 2011 to 24 June 2017. The period started in ramadhan 2011 because in that year calculation and publication of ISSI had just been started. Testing of ramadhan effect was conducted using dummy variable of ramadan month, while to understand the volatility it was conducted using ARCH / GARCH model (Auto Regresive Conditional Heteroscedacity / General Auto Regressive Conditional Heteroscedacity). This model considers a variance that is not constant (heteroscedacity) not as a problem, but it can be used for modeling or forecasting. (Engle, 1982).

The next step in this testing can be explained as follows:
1. Calculating Share Volatility using *Range Based Volatility* model
   Volatility is measured using the formula $V_{s,t} = Ln(Ht) - Ln(Lt)$
   where Ht is the highest price, and Lt is the lowest price on day-t trading.
2. Determining dummy of Ramadhan month
3. Conducting normality test using Jarque Bera test
4. Conducting stationary test on data of the study using ADF
5. Conducting obsevation on *correlogram –Q Statistic* to find out serial correlation
6. Conducting identification of ARIMA model using ACF (*autocorrelation function)* and PACF (*Partial autocorelation function)* from stationary data to determine the orde p,q
7. Testing the effect of ARCH/GARCH in the model of the study
8. Conducting prediction on the parameter of ARCH/GARCH model using *maximumlikehood* with the model:

$$Vol_t = \alpha_0 + \alpha_t DRmd + \sum_{i=1}^{t} \beta_1 Vol_{t-1} + \varepsilon_t$$

Where: Vol_t – Volatility of Share Index on t period
   α_t - Coefficient of dummy variable
   $DRmd$ – Dummy Ramadhan variable
   $\sum_{i=1}^{t} \beta_1 Vol_{t-1}$ –Autoregression with lag Variabel
   ε_t - Error term

The measurement of volatility with the process of ARCH(p) is modeled in the following equation: (Nachrowi, 2006)

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_1 e_{t-1}$$

ARCH model with a relatively large number of p will result in many parameters to be estimated, consequently the precision of the estimator is reduced. To overcome this problem, the parameters estimated for not too much can be used as the GARCH (p, q) model as follow:

$$\sigma_t^2 = \alpha_0 + \sum_{i=1}^{p} \alpha_1 e_{t-1} + \sum_{i=1}^{q} \lambda_1 \sigma_{t-1}^q$$

Where:

   α_0 -   Constanta Component
   $\sum_{i=1}^{t} \alpha_1 e_{t-1}$ – ARCH Component
   $\sum_{i=1}^{q} \lambda_1 \sigma_{t-1}^q$ – GARCH Component
ARCH/ GARCH model is estimated using *Maximum Likelihood* technique.

Findings

This study was conducted from August 1, 2011 to June 22, 2017. The period was taken because Indonesia Sharia Shares Index (ISSI) started on May 12, 2011. The momentum was taken at the beginning of Ramadhan 2011 and the last day of Ramadhan in 2017. It resulted 1439 observation of day research. The month of ramadhan in this study was treated as a dummy variable. The following is the table of ramadhan month during the study period:

Table 1. Ramadhan month in Indonesia during the Study Period

Year	Date
2011	1 Aug - 31 Aug
2012	21 July - 18 Aug
2013	10 July - 7 Aug
2014	29 June - 27 July 2014
2015	18 June - 16 July 2015
2016	6 June - 5 July 2016
2017	27 May - 24 June

Descriptive Statistics

Based on the descriptive statistics of Sharia Share Index (ISSI) and Jakarta Islamic Index (JII), the average of JII volatility was relatively higher (0.0146) compared to the average of ISSI volatility i.e. 0.012. Similarly, from the highest and lowest data discrepancies, JII has a larger interval than ISSI. Here is the result of the complete data description during the observation period that was processed by using eviews 9:

Table of Descriptive Statistics of ISSI and JII Volatilities

	VOLATILITY_ISSI	VOLATILITY_JII
Mean	0.012004	0.014688
Median	0.009784	0.012322
Maximum	0.096018	0.102162
Minimum	0.003023	0.003571
Std. Dev.	0.008059	0.009113
Skewness	3.253918	2.873754
Kurtosis	21.31824	17.27015
Jarque-Bera	22658.86	14190.40
Probability	0.000000	0.000000
Sum	17.27360	21.13533
Sum Sq. Dev.	0.093406	0.119421
Observations	1439	1439

Based on the above table, it also seen the error term has normal distribution, both on JII index and ISSI index with skewness value higher than zero, i.e. 3.253918 and 2.873754, kurtosis which is higher than 3 and probability of Jarque-Bera which is smaller than 5%. Then the null hypothesis is accepted which means the term error for both indexes is normally distributed. The changes in stock volatility during the observation period of August 1, 2011 to 22 June 2017 are illustrated in the following graph:
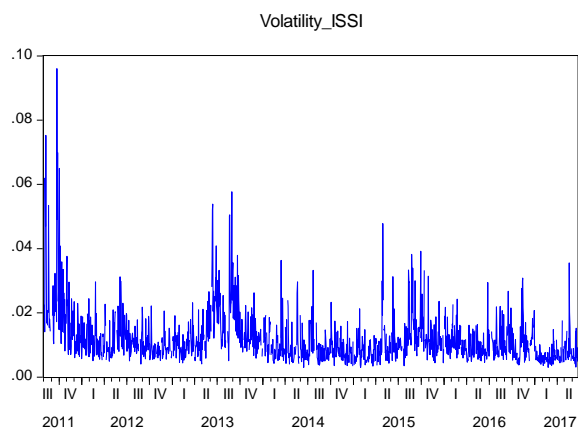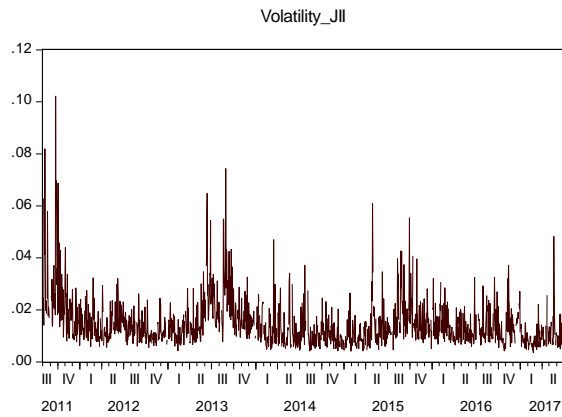
Graph: Volatilities of ISSI and JII in the Period of August 1, 2011 - June 22, 2017

If seen from the chart of volatility, both sharia stock index above shows similar pattern. The highest price was in 2011 because in that year was the beginning of year ISSI launch in Indonesia, JII as sharia index which was first born has the same pattern as ISSI. In the following period, high volatility in general occurred between the second and third quarters. The stock price volatility in this study calculated from the log difference between the highest and lowest prices indicates that there is a greater price difference in the second quarter up to the third. Increased volatility according to (Rijanto, 2011) can occurs due to certain rumors in that period.

The volatilities of JII and ISSI stock index during ramadhan month can be illustrated in the following graph:
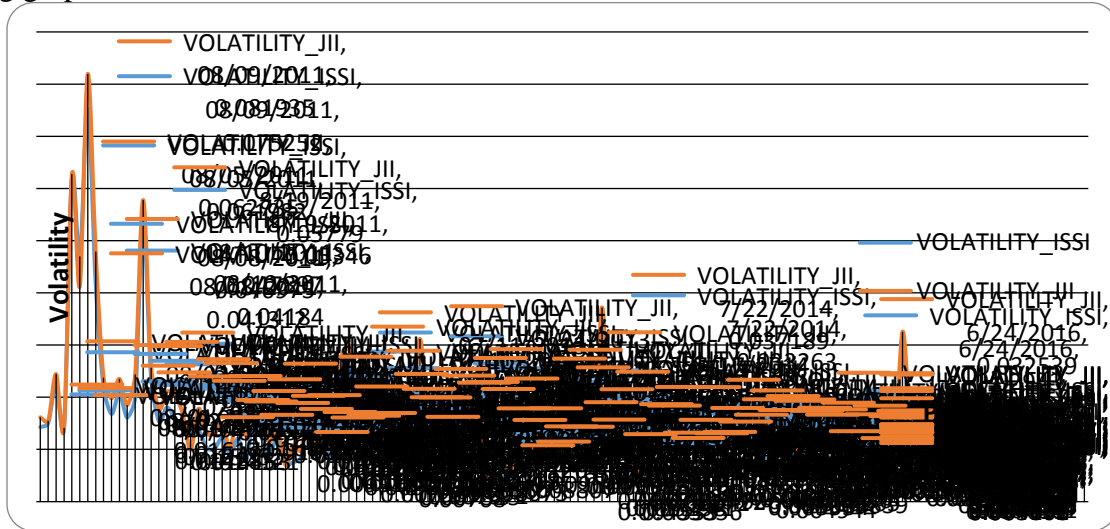
Graph: Volatilities of ISSI and JII During Ramadhan Month 2011 to 2017

From the chart above, the volatility of JII and ISSI stock index during Ramadhan month was relatively not different, but some periods show JII volatility had higher than ISSI with relatively small difference. The highest volatility occurred in Ramadan 2011. On the fourth day it occured increased volatility but the highest volatility on the ninth day of fasting. Volatility during this period was also the highest during the study period. Volatility decreased on the next day until Ied.

Volatility during Ramadan in 2012 and 2015 tends to be low during the study period when compared to other periods of Ramadan. Volatility changes tend not to be too high during Ramadan in that year, but the decline trend was also relatively happening at the end of Ramadhan.

The volatility in Ramadan 2013 especially at the beginning of fasting until the third day tends to increase but decreased until the second week, then increased in a short term of volatility. The next day decreased until the end of Ramadhan. For 2014, the changes of volatility were relatively random during Ramadan month. The highest volatility was in the third week but decreased in late trading during Ramadan.

Differences in volatility compared to the previous year occurred in 2016 and 2017. In the early Ramadhan, it tends to experience a low volatility, but on about 20th day of Ramadan, it increased for several days which was then followed by the downward trend of volatility at the end of Ramadhan before the holiday of Eid Fitr.

In general, changes in volatility during Ramadan during the 7-year period of the study show a tendency of increasing volatility in the early of the first week of Ramadhan then decreasing in a short term. This decline did not last long because in the mid of Ramadhan, it again experienced an increase in stock volatility by the end of Ramadhan before Eid Fitr holiday. Investors in the capital market who most were local investors tend to allocate more funds for the increasing needs ahead

of Eid. The decline of stock indexes at the end of Ramadhan could happen because many investors were selling their shares in order to get profit taking.

The 2016 and 2017 periods showed increasing volatility in the mid to the late of Ramadhan. Many investors were investing in the capital market so that volatility was increasing. This could be due to the global crisis changes which by some analyses have been improved and have an impact on regional exchanges including in Indonesia Stock Exchange so that there is investor optimism and an increase on stock transaction. In addition, social and political conditions are considered still conducive to the investment climate.

Ramadhan Effect and Share Volatility Testing

1. **JII (*Jakarta Islamic Index)* Index Testing**

JII is a collection of 30 best sharia stocks based on market capitalization and trade transaction liquidity. The first test conducted in this study was examining the effect of Ramadhan on the volatility of sharia stock index. Before conducting the test, it was first conducting stationary test on the data. The non-stationary data would lead to the result of false regression estimation or spurious regression, where the result of determination coefficience is large and the regression coefficient is significant but the durbin watson value is low. (Nachrowi, 2002). The stationary test of data used in this research was the Unit Root test by performing the ADF test (Augmented Dickey Fuller Test). Here's the output test view:

Table of Stationary Test Using Unit Root Test on JII

Null Hypothesis: VOLATILITY_JII has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic - based on SIC, maxlag=23)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.639070	0.0000
Test critical values:	1% level	-3.434708	
	5% level	-2.863352	
	10% level	-2.567783	

*MacKinnon (1996) one-sided p-values.

From Unit Root Test result, it was shown the result of ADF Test statistics value was -7,639 which is smaller than its critical value at level 1%, 5%, or 10% so that the data have no problem of unit root or it can be said that **the data are stationary**.

The next step was to observe the correlogram-Q Statistic chart to see if the data have serial correlation. the results of observation correlogram - Q Statistic obtained information that until lag to 36 the volatility of JII has a serial correlation in lag 1,2,3,6 and 7. In the study model, it also obtained the results that were not yet perfect where the finding element of autorcorrelation and variance is not constant (heteroscedasticity). Here are the results of heteroscedasticity test conducted by White test:

Table of Heteroscedasticity White Test

Heteroscedasticity Test: White

F-statistic	4301.822	Prob. F(65,1373)	0.0000
Obs*R-squared	1431.969	Prob. Chi-Square(65)	0.0000
Scaled explained SS	2.28E+12	Prob. Chi-Square(65)	0.0000

The value of Obs*Squared is significant at 1% which means that there is a trouble in Heteroscedasticity on the model so that the model then should use GARCH (p,q) model. Here is the display of regression result using GARCH (1,1)

Table of the Regression of Dummy Variable of Ramadhan on JII with GARCH (1,1) on Indolence of 1,2,3,6, and 7

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.013427	0.000743	18.06995	0.0000
D_RAMADAN	-0.000965	0.001385	-0.696526	0.4861
AR(1)	0.260282	0.028615	9.095919	0.0000
AR(2)	0.176338	0.028477	6.192361	0.0000
AR(3)	0.070962	0.031184	2.275600	0.0229
AR(6)	0.101295	0.029579	3.424521	0.0006
AR(7)	0.101122	0.026573	3.805457	0.0001
	Variance Equation			
C	9.02E-07	1.01E-07	8.892852	0.0000
RESID(-1)^2	0.037071	0.004602	8.054850	0.0000
GARCH(-1)	0.942303	0.004108	229.4060	0.0000
R-squared	0.336098	Mean dependent var		0.014688
Adjusted R-squared	0.333317	S.D. dependent var		0.009113
S.E. of regression	0.007441	Akaike info criterion		-7.170597
Sum squared resid	0.079284	Schwarz criterion		-7.133962
Log likelihood	5169.245	Hannan-Quinn criter.		-7.156921
Durbin-Watson stat	1.904150			
Inverted AR Roots	.90	.49-.57i	.49+.57i	-.22-.67i
	-.22+.67i	-.59+.24i	-.59-.24i	

The previous table shows the result that lower stock volatility occured in Ramadan on JII index although the number is relatively small ie -0.000965 or lower 0.096% compared to the months other than ramadhan. Regression results were also found that the ramadhan dummy coefficient was not statistically significant. This means that although there were differences in stock volatility in Ramadan but the difference was not significant, or it can be said that there is no ramadhan effect on the volatility of JII stock index. The GARCH test results show that residual variance of JII stock index was affected by the previous residual at 1, 2,3,6,7. The independent variables of AR (1), AR (2), AR (3), AR (6), and AR (7) were significant at error level of 1% and 5%. Furthermore, this

study would also test whether the model with GARCH element is already free from ARCH element. The detection was done by ARCH-LM test at 30 incation levels. The results are presented in the table below:

Table of ARCH Detection Using ARCH-LM Test on 30 Indolence of JII

Heteroscedasticity Test: ARCH

F-statistic	0.810125	Prob. F(30,1378)	0.7566
Obs*R-squared	24.41982	Prob. Chi-Square(30)	0.7527

From the table, it can be seen that the value of Obs * R-squared that describes the value of Chi Square is 24.419 with probablity of 0.7527, which means to the level of indolence 30, Chi square value is not statistically significant. The model does not contain ARCH element. JII stock index volatility is not only affected by current price volatility but also affected by price volatility in the previous time. The GARCH variance 0.9423 is quite high. This means that there was a very high volatility during the observation period on the JII stock index.

2. ISSI (Indonesia Sharia Share Index) Index Testing

Indonesia Sharia Share Index (ISSI) is a collection of all Sharia shares in Indonesia capital market. So, ISSI is similar to IHSG which calculates all shares in the equity market without sharia or non-sharia share classification. ISSI measures the movement of all Sharia shares in the stock exchange. As in the test of JII index, in this test the first stage also tested the stationary data. The Unit Root test results with the ADF (Augmented Dickey Fuller Test) test are displayed in the test output as follows:

Table of Stationary Test Using Unit Root Test on ISSI

Null Hypothesis: VOLATILITY_ISSI has a unit root
Exogenous: Constant
Lag Length: 6 (Automatic - based on SIC, maxlag=23)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		-7.813166	0.0000
Test critical values:	1% level	-3.434708	
	5% level	-2.863352	
	10% level	-2.567783	

*MacKinnon (1996) one-sided p-values.

The Unit Root test results show the results of the ADF Test statistics value of -7.813166 which is smaller than the critical value at the level of 1%, 5%, and 10% so that the data does not experience unit root problems or it can be said that **the data are stationary.** The result of observation of correlogram - Q statistic graph using resulted that up to 36th lag the volatility of ISSI has the serial correlation in lag 1,2,3,6,7 and 10. In the study model, it was also obtained an incomplete result where the variance was not constant (heteroscedasticity).

Table of Heteroscedasticity White Test on ISSI

Heteroscedasticity Test: White

F-statistic	4396.376	Prob. F(77,1361)	0.0000
Obs*R-squared	1433.238	Prob. Chi-Square(77)	0.0000
Scaled explained SS	4.12E+12	Prob. Chi-Square(77)	0.0000

The value of Obs * Squared was also significant at 1% error level meaning that heteroscedasticity interference occurs in the model so that the study model should use GARCH (p, q) model. Here is the display of regression results with GARCH (1,1)

Table of the Regression of Dummy Variable of Ramadhan on ISSI with GARCH (1,1)
on Indolence of 1,2,3,6, and 7

Variable	Coefficient	Std. Error	z-Statistic	Prob.
C	0.010784	0.000697	15.48119	0.0000
D_RAMADAN	-0.000671	0.001254	-0.535129	0.5926
AR(1)	0.278045	0.027915	9.960512	0.0000
AR(2)	0.160200	0.027649	5.793970	0.0000
AR(3)	0.062142	0.031494	1.973138	0.0485
AR(6)	0.091613	0.030713	2.982887	0.0029
AR(7)	0.081352	0.029282	2.778272	0.0055
AR(10)	0.063111	0.025650	2.460415	0.0139
Variance Equation				
C	6.89E-07	6.72E-08	10.25008	0.0000
RESID(-1)^2	0.035662	0.004304	8.286046	0.0000
GARCH(-1)	0.940732	0.004152	226.5634	0.0000
R-squared	0.363666	Mean dependent var		0.012004
Adjusted R-squared	0.360553	S.D. dependent var		0.008059
S.E. of regression	0.006445	Akaike info criterion		-7.531345
Sum squared resid	0.059437	Schwarz criterion		-7.491047
Log likelihood	5429.802	Hannan-Quinn criter.		-7.516301
Durbin-Watson stat	1.887183			
Inverted AR Roots	.92	.59+.46i	.59-.46i	.30-.64i
	.30+.64i	-.24-.74i	-.24+.74i	-.60-.42i
	-.60+.42i	-.74		

The previous table shows the result that stock volatility during Ramadhan month in ISSI index group was also lower although the number was relatively small ie -0.000671 or 0.067% which was lower than the months other Ramadhan month. Regression results were also found that the Ramadhan dummy coefficient was not statistically significant. This means that although there were differences in stock volatility in Ramadhan but the difference was not siginficant, or it can be said that there was no Ramadhan effect on the volatility of ISSI index.

The GARCH test results show residual variance of ISSI stock index affected by the previous residuals at 1, 2,3,6,7, and 10 of indolence levels. The independent variables of AR (1),

AR (2), AR (3), AR (6), AR (7), AR (10) were significant at error level of 1% and 5%. Furthermore, this study would also test whether the model with GARCH element is already free of ARCH element. The detection was done by ARCH-LM test at 30 indolence levels. The results are presented in the table below:

Table of ARCH Design Detection with ARCH-LM Test on ISSI on 30 Indolence

Heteroscedasticity Test: ARCH

F-statistic	0.890916	Prob. F(30,1378)	0.6369
Obs*R-squared	26.80878	Prob. Chi-Square(30)	0.6333

From the table, it can be seen that the value of Obs * R-squared that describes the value of Chi Square is 26.808 with probablity of 0.6333 meaning that up to the level of indolence 30, Chi square value was not statistically significant. The model did not contain ARCH element. The volatility of the ISSI stock index was not only affected by current price volatility but also affected by price volatility in the past. The Variance of GARCH 0.9407 was quite high. This means that there was a very high volatility during the observation period in the ISSI stock index.

Implication of Findings

The findings of the research above show the results that there is no Ramadhan effect on stock index volatility of both sharia share indexes in the Indonesian capital market, namely JII and ISSI. The lack of effect reinforces the previous study which was conducted by the researcher that there is no Ramadhan effect on sharia stock index returns with research objects in Indonesian sharia stock exchange and Malaysian stock exchange. This means that the hypothesis of the efficient capital market of weak form is proven from the results of this study. The euphoria of Ramadhan month in the real sector is not necessarily followed by the players in the capital market.

This study is conducted on syariah stock index group which is non-sectoral index. Stock performance during fasting month differs in each sector. The performance of the sector index during the fasting month of 2004 to 2015 shows that certain sectors which perform well during the fasting month are infrastructure, consumer goods, various industries, finance, and basic & chemical industries with an increase of 60 - 80%. While agriculture, trade, property, and mining are relatively low with a 0.01% to 0.9% increase in return. Sharia stock index is a combination of all existing sectors but is included in the group of Sharia shares. From the observations made by the researcher, of the nine sectors in the capital market, the financial sector has never entered the JII group during the observation period. However, the ISSI Index is classified but not too many.

Share volatility shows a similar pattern where high volatility occurs in mid-year i.e. around the second quarter to third, which is about April to October. This could be because in the first quarter investors are still reading the direction of economic movement and government policy to take the right decision of which stocks to be bought or sold. The volatility of both sharia share indexes is lower in Ramadhan, although the statistics are not significant. The low volatility in Ramadhan could be due to the need of investors for funds during Ramadhan and preparations for the upcoming Eid. This causes a decrease in trading transactions during Ramadhan so that the

volatility of stocks measured from natural logs. The highest price minus the lowest price is also lower than the months other than Ramadan.

The results of GARCH variance show that the volatility in JII is relatively higher than the ISSI although with a very small difference of 0.0016 (0.9423-0.9407) or 0.16%. The relatively higher volatility in the JII group can occur because JII is a collection of 30 sharia shares with the best performance, thus it encourages investors to be interested in placing investment in the JII index group, as a result there is a relatively higher price difference between the highest stock and the lowest price. In the ISSI group with more than 300 shares (according to data of May 2017, there are 331 shares) it has high volatility as well. Therefore, investors should be careful in placing funds. The high volatility reflects investment risks. Expectations on high returns are accompanied by high investment risk as well.

Conclusion

The results of the research that has been done show the results that there is no Ramadhan effect on the volatility of JII index and ISSI index. The volatility of index price in Ramadhan with months other than ramadhan is not different meaning that the hypothesis of efficient capital market which is efficient in weak is proven in this study. The volatility reflecting the investment risk level shows that the level of investment risk in Ramadhan has a risk that is not different from the months other than Ramadhan.

Volatility during Ramadan in 2011 - 2015 tends to increase at the beginning of Ramadhan week then decrease in the short term but increase again until by the end of Ramadhan. The volatility again shows a declining trend at the end of Ramadhan for the Ied Fitr holiday. This is because investors are allocating funds for Ied. However, during 2012 and 2015, it is showed relatively lower stock volatility compared to the other periods. This indicates a decline in stock transactions during the year. The period of 2016-2017 indicates somewhat different conditions as volatility increases in the mid to late Ramadhan. Investors consider that social and political conditions during the year are considered conducive enough to be safe to conduct the transactions. This difference can also occur due to the improvement of the global economic crisis that affects the Indonesian stock exchange.

The test was conducted using regression with GARCH model because this study is a research with time series data where the potential occurrence of serial correlation disorder and Heteroscedasticity are very high. From the study, It is also obtained that JII volatility has serial correlations with 1,2,3,6 and 7 indolences. While the ISSI has serial correlations with 1,2,3,6,7 and 10 indolences. The volatility of both indexes is not only affected by the current price but also the price in previous periods.

Suggestion

The results of the test show that there is no Ramadhan effect on the non-sectoral stock group, namely the sharia stock index (JII and ISSI) so further research may try to see the possibility of Ramadhan effect on sectoral stock group especially in the sectors that have good performance

during fasting month, namely the sectors of infrastructure, consumer goods, various industries, finance, and basic industries & chemicals.

Future research with Ramadhan anomaly testing and other seasonal anomalies can be done with other econometric tests e.g. TARCH (Threshold ARCH) to see a symmetrical or asymmetrical fluctuation of stock volatility.

Investors should be careful when placing in sharia shares because of the high volatility in both sharia indexes. The high volatility reflects the high level of investment risk.

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