



GLOBAL JOURNAL OF MANAGEMENT AND BUSINESS RESEARCH: B
ECONOMICS AND COMMERCE

Volume 20 Issue 5 Version 1.0 Year 2020

Type: Double Blind Peer Reviewed International Research Journal

Publisher: Global Journals

Online ISSN: 2249-4588 & Print ISSN: 0975-5853

Effect of Market Risk Premium and Exchange Rate on the Return of Jakarta Islamic Index

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Keywords: *market risk premium, exchange rate, return, jii, var.*

GJMBR-B Classification: *JEL Code: F39*



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I. INTRODUCTION

Along with the development of the Islamic economy, sharia capital markets are also developing in various countries, including Indonesia. To meet the needs of the public for investments that avoid usury, in Indonesia began to develop the Islamic capital market, which provides an opportunity for investors who want to develop their investments according to Islamic principles. One of the existing index in the Indonesia Stock Exchange (IDX) is Jakarta Islamic Index (JII), which calculates the index average of 30 stocks that meet the criteria of sharia, the biggest market capitalization and having a high level of liquidity in trade values.

Jakarta Islamic Index (JII) was launched for the first time on July 3, 2000 and is evaluated every six months. From year to year, the Jakarta Islamic Index (JII) shows significant developments. This can be shown as in Figure 1.

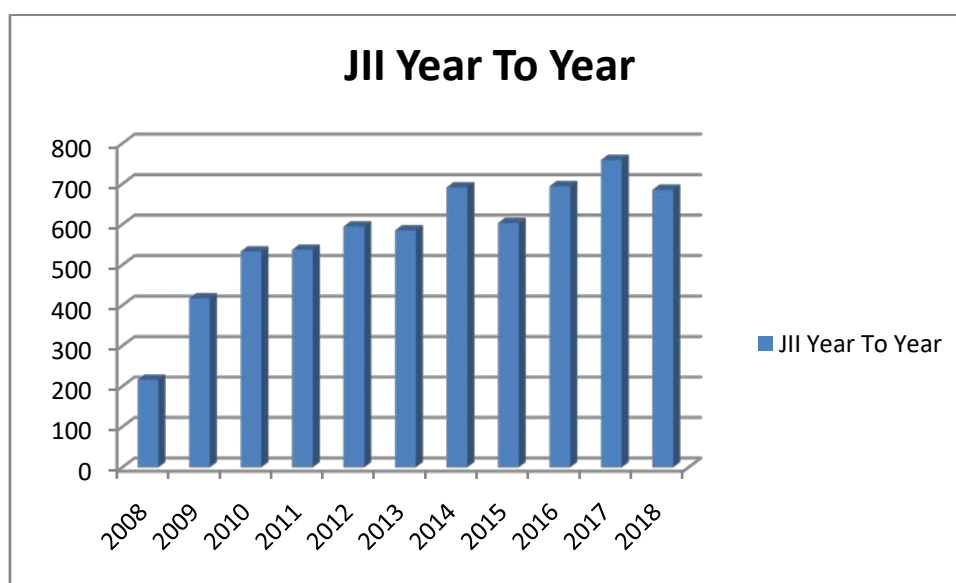


Figure 1: JII Development

Based on the graph above shows that at the end of 2008 the Jakarta Islamic Index was at 216.189 and increased by 92.97% in 2009 to 417,182. In 2010 JII also increased by 27.74% from the previous year to 532,

901 and continued to increase by 0.77% to 537,031 in 2011. The index increase also occurred in 2012, JII was at the level of 594,789 or up by 10, 76% from 2011. In 2013, JII declined slightly to 585.11, down by 1.63%, then the year 2014 index ride's back at the level of 691.039, or increase of 18.1%, but decreased by 12,

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69% in 2015 became 603,349. In 2016 the index increased by 15.05%, which was in the position of 694.127 and followed by an increase in 2017 at the level of 759.07 or up 9.36%. At the end of 2018 JII decreased by 9.73% to 685,223.

In line with the international economic turmoil, the capital market world also faces risks that must be faced by issuers and investors. In the capital markets, there is a risk in line with the fluctuations in prices on the market, which will bring the impact on the return stock. In addition, there is also the risk of the market which is measured by the beta as a risk which is faced by an instrument of investment that is caused by a factor of economic, social, political and so on. An investor who take risks more will get a return that is better. In Arbitrage Pricing Theory (APT), risk premium which is an additional level of return for investors taking the risk that more, will affect the rate of return. In this study, the variable used is market risk premium that describe general economic conditions. As for the measurement of market risk premium variable measured from the market return (R_M) minus the risk-free return of bank Indonesia (R_F) or market risk premium is $R_M - R_F$. Whereas R_M is measured by the movement of the Composite Stock Price Index in the Indonesia Stock Exchange. $R_M - R_F$ is the risk premium level of the market portfolio which is proportional to the risk of the risk aversion level of each investor.

One of the macroeconomic factors that affect the return is exchange rate. Exchange rate is the price

of currency against the currency of money more, where the prices are related to the offer and demand of money. Exchange rate also often fluctuate in accordance with the situation and economic conditions in a country. Rupiah exchange rate against the US\$ greatly affects stability of the stock price in the market, especially for issuers who use US\$ in their international transactions, so when the exchange rate of Rupiah decreased, then Composite Stock Price Index also declined.

According to Tanjung (2014) the Jakarta Islamic Index return fluctuate greatly. Observations using JII daily data from 2 March 2009 to 30 September 2013 (1122 observations) show that JII return do not spread normally. The minimum return is almost -10% and the maximum is almost 10%, this shows that in one day, there is a possibility to get a loss of almost 10% and a profit of almost 10%.

Jakarta Islamic Index observations for period 2 March 2009 - 28 July 2009 or with 100 data (4 months) show that the distribution of JII's return is normal, while observations with 300 data (1 year) show that the distribution of JII's return is not normal, observations with 600 data (2 years) shows the distribution of JII's return data is not normal and observations with 900 data (3 years) indicate that the distribution of JII's return is not normal (Tanjung, 2014).

By the same analysis technique and enlarged data from 2008 to 2018, JII's return also looks very fluctuating, as can be seen in Figure 2.

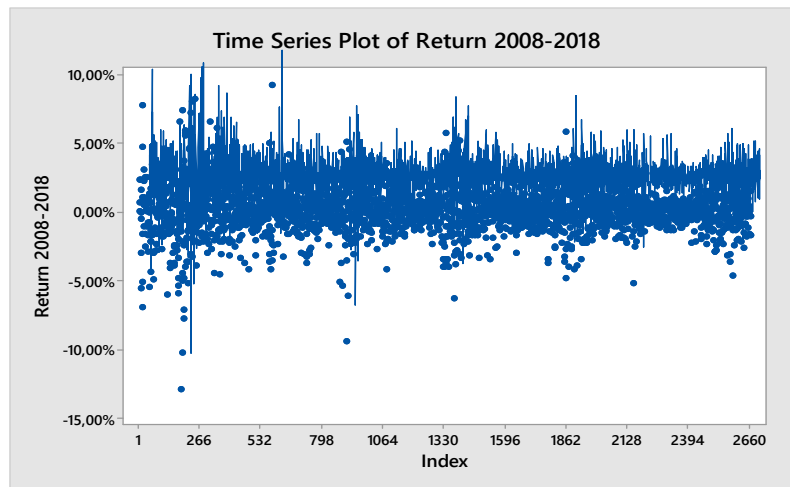


Figure 2: Time Series Plot of JII Return 2008-2018

In this graph shows that the return of the Jakarta Islamic Index minimum of almost -15 % and a maximum of nearly 10%, which shows that in one day, there is the possibility to get loss nearly 15 % and profit nearly 10 %. The distribution of JII's return data from 2008 to 2018 can be seen in Figure 3.

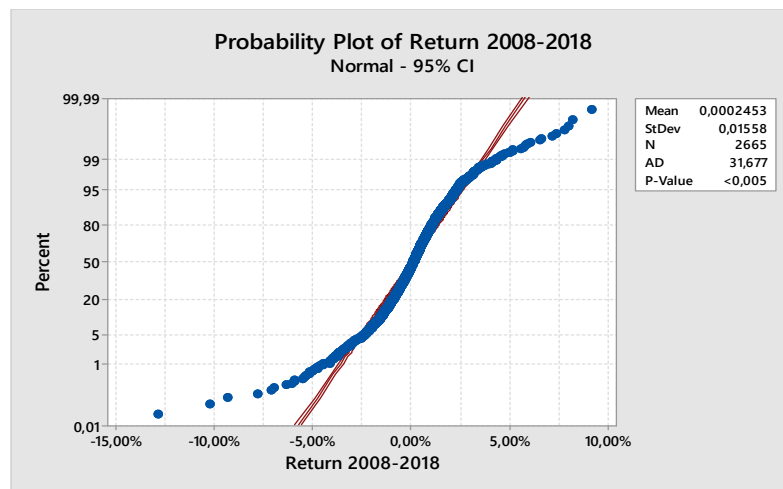


Figure 3: Probability Plot of JII Return 2008-2018

From the graph it can be known that Anderson Darling Test of 31,677 and P-Value < 0.005. This means that the zero hypothesis which states that the distribution of JII return normally rejected, regard this indicates that the distribution of JII return from 2008 to 2018 does not spread to normal. So, JII return only partially minor who has a normal distribution, ie the data small. Volatility of JII is smaller by small data and bigger by large data.(Tanjung, 2014)

Based on the Jakarta Islamic Index return which is very fluctuating and most of the data are not normal, this study aims to analyze the effect of market risk premium and exchange rate on the Jakarta Islamic Index return.

II. LITERATURE REVIEW

Previous research was conducted by Tanjung (2014), Rjoub, Tursoy and Gunsell (2009), Mayfi and Rudianto (2014), Utami and Herlambang (2016), Muhayatsyah (2012), Dewanti (2013), Pantas (2017), Leong and Hui (2014), Sudarsono (2018), Febrina, Sumiati and Ratnawati (2018), Omoruyi and Osaretin (2015), Hsing (2008), Jorion (1990), Bodnar and Gentry (1993), Salifu, Osei and Adjasi (2007), Jayashankar and Ruth (2017), Jiranyakul (2012), Khan and Khan (2018), Beik and Fatmawati (2014), Naik and Padhi (2012).

Based on the results of these studies indicate that the JII return is highly fluctuating and does not spread normally (Tanjung, 2014). The study of Rjoub, Tursoy and Gunsell (2009) showed that risk premium has a significant effect on return. Research of Mayfi and Rudianto (2014) and Utami and Herlambang (2016) show that the exchange rate of significant positive effect on JII. While Muhayatsyah (2012), Dewanti (2013) and Pantas (2017) found that the exchange rate has a significant negative effect on JII. Leong and Hui (2014) revealed that exchange rate has a negative relationship

on return. Sudarsono (2018) found that the exchange rate has a negative effect on ISSI. Febrina, Sumiati and Ratnawati (2018) revealed that the exchange rate had a negative effect on the Composite Index. Omoruyi and Osaretin (2015) found that the exchange rate has a negative relationship with the stock market index in Nigeria.

Hsing's research (2008) shows that exchange rates are positively influenced by stock prices. Jorion (1990) found that only 15 companies have exchange rate significantly from 287 company tested, Bodnar and Gentry (1993) found that the exchange rate significantly in 22 of the 78 industries examined, Salifu, Osei and Adjasi (2007) found that out of 20 companies, 11 companies have significant exposure to USD exchange rate risk. Jayashankar and Ruth (2017) revealed that there is a reciprocal relationship between stock prices, exchange rates and interest rates in India. Jiranyakul (2012) found a positive directional causality relationship from stock market returns to exchange rates in Thailand. Khan and Khan (2018) show that exchange rates and interest rates have a significant effect on share prices on the Karachi Stock Exchange in the long run.

The research of Beik and Fatmawati (2014) shows that the exchange rate has no significant effect on the Jakarta Islamic Index. Naik and Padhi (2012) find that exchange rates and short-term interest rates are not significant in determining stock prices.

III. HYPOTHESIS

This research was conducted to answer various questions contained in previous literature by using the following hypotheses:

1. The effect of market risk premium on the Jakarta Islamic Index return

H₀: Market risk premium has no effect on the return of Jakarta Islamic Index.

H₁: Market risk premium influences the return of Jakarta Islamic Index.

2. The effect of exchange rate on the return of Jakarta Islamic Index

H_0 : The exchange rate has no effect on the return of Jakarta Islamic Index.

H_1 : Exchange rates affect the Jakarta Islamic Index return.

IV. METHOD

This study analyzes the effect of market risk premium and exchange rate on the Jakarta Islamic Index return. The models in this study are as follows:

The variables can be defined operationally as shown in table 1.

Table 1: Operational Definition of Variables

Number	Variable	Definition	Measurement
1.	Return of JII	The difference between JII of the current month minus JII of the previous month divided by JII of the previous month	$JII \text{ Return} = \frac{JII_t - JII_{t-1}}{JII_{t-1}}$
2.	Market Risk Premium	The difference between market return minus risk free interest rate of Indonesia Bank	Market Risk Premium = $R_M - R_f$
3.	Exchange rate	The difference between the current month exchange rate minus the previous month exchange rate divided by the previous month exchange rate	$ER = \frac{ER_t - ER_{t-1}}{ER_{t-1}}$

The type of data used in this study is secondary data from January 2008 to December 2018. The data used in this study were obtained from various sources, including data of Jakarta Islamic Index and Composite Stock Price Index from Indonesia Stock Exchange and data of interest rate and exchange rate from Bank Indonesia.

This study uses descriptive analysis method and quantitative. The analytical tool used is the Vector Auto regression (VAR) method. The general VAR equation is as follows (Firdaus 2011):

$$y_t = A_0 + A_1 y_{t-1} + A_2 y_{t-2} + \dots + A_p y_{t-p} + \epsilon_t$$

Where:

y_t = size vector (n.1) containing n variables contained in a VAR model

A_0 = intercept vector sized (n.1)

A_i = coefficient matrix / size parameter (nn) for each $i = 1, 2, \dots, p$

ϵ_t = error vector sized (n.1)

The stages of analysis using VAR model are as follows:

a) Data Stationarity Test

The first step in estimating the VAR model is the data stationarity test. The selected data is stationary data that does not contain unit roots, because if the data used contain unit root elements, it will be difficult to estimate a model because the trend of the data tends to

$$RJII = \beta_0 + \beta_1 (R_M - R_F) + \beta_2 ER + e$$

Where:

RJII = Return of the Jakarta Islamic Index

β_0 = Interception

β_1, β_2 = Parameters

$R_M - R_F$ = Market Risk Premium

ER = IDR/US\$ exchange rate

e = Error

fluctuate around the average value (Gujarati, 2004). So it is necessary to test the stationarity of data using the Augmented Dickey-Fuller (ADF). If the value of the ADF statistic is smaller than MacKinnon Critical Value, it can be concluded that the data is stationary.

b) Optimum Lag Test

This test is carried out to form a good VAR model by determining the optimum lag length. Determination of the number of lags that will be used in the VAR model can be determined based on the criteria of Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) or Hannan Quinon Criterion (HQ). The lag that will be selected in this research model is the model with the smallest value. Too much lag length increases degrees of freedom, so smaller lags are recommended to minimize error specifications (Gujarati, 2004).

c) VAR Stability Test

VAR stability test is done by calculating the roots of polynomial functions or known as roots of characteristic polynomials. If all the roots of the polynomial function are inside the unit circle, the VAR model is considered stable so that the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) produced are considered valid (Firdaus, 2011).

d) Impulse Response Function (IRF)

Impulse Response Function (IRF) is a method used to determine the response of an endogenous variable to a particular shock. This is because shock variables, for example the i -th variable, do not only affect the i -th variable but are transmitted to all other endogenous variables through dynamic structures or lag structures in VAR. In other words, IRF measures the impact of a shock at a time on the innovation of endogenous variables at that time and in the future. IRF aims to isolate shocks to be more specific, which means that a variable can be affected by certain shocks or shocks. If a variable cannot be affected by shock, then the specific shock cannot be known but rather shock in general (Firdaus, 2011).

e) Forecast Error Variance Decomposition (FEVD)

The FEVD analysis in the VAR model aims to predict the contribution of the percentage of variance

of each variable due to changes in certain variables in the VAR system. This test provides information about the proportion of the movement of the effect of shock on one variable against other variables at this time and future periods. Then it can be seen how strong the composition of the role of variables on other variables and it can also be known which shock variables have the most important role in explaining changes in other variables in the study period (Tanjung and Devi, 2018).

V. DISCUSSION

a) Data Stationarity Test Results

The first step in analyzing time series data is the data stationarity test. Unit root test results at the level shown in table 2.

Table 2: Unit Root Test Results at Level

Variable	ADF value	Mackinnon's Critical Value			Information
		1%	5%	10%	
RJII	-8.794614	-2.582872	-1.943304	-1.615087	Stationary
MRp	-8.473885	-2.582872	-1.943304	-1.615087	Stationary
ER	-10,18931	-2.582872	-1.943304	-1.615087	Stationary

Stationary test results at the level indicate that all variables are stationary at the level that includes variable of Jakarta Islamic Index return (RJII), market risk premium (MRP) and exchange rate (ER), because the absolute value of the ADF is smaller than the critical value of Mackinnon at the level of 5%.

b) Optimum Lag Test Results

Determination of lag in the VAR model is very useful to eliminate autocorrelation. The optimum lag test results are shown as shown in table 3.

Table 3: Optimum Lag Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	828.0082	NA	3.00e-10	-13.41477	-13,34618 *	-13.38691
1	844.8537	32,59552	2.64e-10 *	13,54234 *	-13,26798	-13.43089*
2	852,338	14.11619	2.70e-10	-13.51769	-13.03756	-13,32266
3	858.1776	10.73008	2.85e-10	-13,46630	-12.78040	-13.18769
4	861.1402	5.299003	3.15e-10	-13.36813	-12.47647	-13.00594
5	874,4882	23.22331*	2.94e-10	-13.43883	-12.34139	-12.99306
6	880.1111	9.508710	3.11e-10	-13.38392	-12,08071	-12.85456
7	887.6630	12.40228	3.20e-10	-13.36037	-11,85140	-12.74743
8	893.3145	9.005698	3.40e-10	-13.30593	-11.59118	-12,60940

The optimum lag determination used in this study is based on the shortest lag using Akaike Information Criterion (AIC). Based on the calculation of the value of Akaike Information Criterion (AIC), the optimum lag is at lag 1.

c) Stability Test Results

The VAR model is considered stable if the modulus value for all roots is smaller than one and is at an optimal point. The results of stability test can be seen in table 4.

Table 4: Stability Test Results

Root	Modulus
0.139874 - 0.182243i	0.229733
0.139874 + 0.182243i	0.229733
-0.152403	0.152403

Based on the results of stability test above shows that the modulus value for this research model ranges between 0.152403-0.229733. These results indicate that the VAR model is stable to the optimum lag.

premium (MRP) does not significantly influence on the return of Jakarta Islamic Index (RJII), while the exchange rate (ER) has a significant positive effect on the return of the Jakarta Islamic Index.

d) VAR estimation Results

VAR estimation result can be seen as shown in table 5. Based on the table shows that market risk

Table 5: VAR Estimation Results

	RJII	MRP	ER
RJII (-1)	0.263847 (0.31104) [0.84827]	0.303923 (0.28979) [1.04876]	0.016074 (0.14780) [0.10875]
MRP (-1)	0.187815 (0.34762) [0.54029]	0.156931 (0.32387) [0.48455]	-0.312838 (0.16518) [-1.89389]
ER (-1)	0.573712 (0.23481) [2.44328]	0.506682 (0.21877) [2.31604]	-0.293432 (0.11158) [-2.62980]
C	0.000375 (0.00526) [0.07129]	-0.001068 (0.00490) [-0.21788]	0.005960 (0.00250) [2.38351]
R-squared	0.105730	0.128479	0.176478
Adj. R-squared	0.084437	0.107729	0.156871
Sum sq. resids	0.428945	0.372341	0.096857
SE equation	0.058347	0.054361	0.027726
F-statistics	4.965659	6.191623	9.000474
Log likelihood	186,9454	196,1441	283.6716
Akaike AIC	-2.814545	-2.956063	-4.302640
Schwarz SC	-2.726313	-2.867831	-4.214408
Mean dependent	0.004252	0.002651	0.004064
SD dependent	0.060978	0.057549	0.030195
Determinant residual covariance (dof adj.)		3.52E-10	
Determinant residual covariance		3.20E-10	
Log likelihood		867.6454	
Akaike information criterion		-13.16378	
Schwarz criterion		-12.89908	
Number of coefficients		12	

The effect of independent variables on the dependent variable can be analyzed as follows:

a. Hypothesis Testing 1

The first hypothesis proposed states that the market risk premium does not affect on the Jakarta Islamic Index return. Based on the results of the study, in the first lag the market risk premium has a t-count value of 0.54029 with a regression coefficient of 0.187815. Because of the t arithmetic is smaller than 2 then H_0 is accepted and H_1 is rejected which means that the market risk premium has no significant effect on the return of Jakarta Islamic Index.

This study result contradicts with APT theory developed by Ross (1976) which states that stock returns are affected by the risk premium. The results of research that reinforce the concept of this theory are research conducted by Rjoub, Tursoy and Gunsel (2009) which shows that the risk premium has a significant influence on the stock return.

This difference occurs because of the Jakarta Islamic Index shares are based on sharia principles which avoid the usury/interest element. Because the market risk premium is a picture of general economic conditions in which many conventional stocks still apply

an interest system. While interest is an instrument that is not in accordance with sharia. So the ups and downs of the market risk premium (general economic conditions) will not provide significant impact for investors, so investors are more secure to invest in stocks of Jakarta Islamic Index as compared to conventional shares.

b. Hypothesis Testing 2

The second hypothesis states that the exchange rate has no effect on the return of the Jakarta Islamic Index. Based on the results of the study indicate that the exchange rate in the first lag has a regression coefficient of 0.573712 and t-arithmetic of 2.44328. Because t arithmetic is greater than 2, then H_0 is rejected and H_1 is accepted which means that the exchange rate has a significant positive effect on the return of Jakarta Islamic Index.

This is consistent with the Portfolio Balance Model (PBM) approach from Frankel (1983) which states that there is a positive relationship between exchange rates and stock returns. The results of the study that reinforce the concept of this theory are research conducted by Mayfi and Rudianto (2014) and Utami and Herlambang (2016) which show that the exchange rate has a significant positive effect on JII.

But the results of this study differ from the concept of Solnik's theory (1987) which states that the depreciation of the exchange rate will increase stock prices. The research that supporting this theory is the research conducted by Muhyatsyah (2012), Dewanti (2013) and Pantas (2017) which shows that the exchange rate has a significant negative effect on JII. Leong and Hui (2014) revealed that exchange rates have a negative relationship with stock returns. Sudarsono (2018) found that the exchange rate had a negative effect on ISSI. Febrina, Sumiati and Ratnawati (2018) found that the exchange rate had a negative effect on the Composite Index Omoruyi and Osaretin (2015) found that the exchange rate has a negative relationship with the stock market index in Nigeria.

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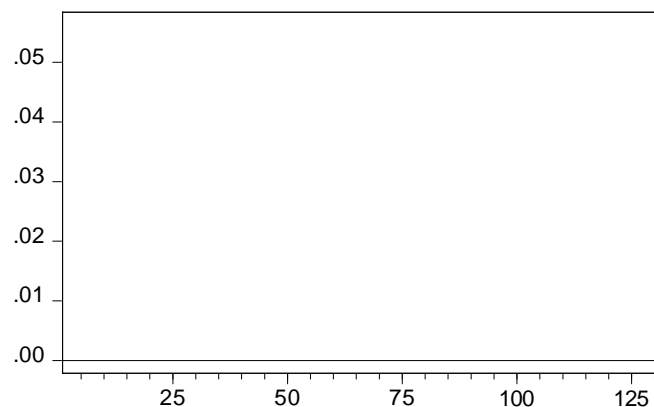
The research of Beik and Fatmawati (2014) shows that the exchange rate has no significant effect on the Jakarta Islamic Index. Naik and Padhi (2012) find that exchange rates and short-term interest rates are not significant in determining stock prices.

The significant effect of the exchange rate on the return of Jakarta Islamic Index indicates that the number of foreign investors investing in Jakarta Islamic Index shares is quite large. This shows a good investment climate for Islamic stocks in Indonesia, because it has the trust of foreign parties, then investors need to pay attention to this factor.

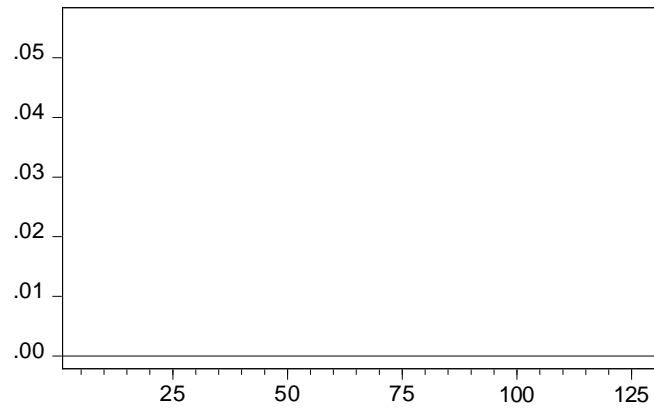
e) Impulse Response Function (IRF)

The results of the Impulse Response Function for the Jakarta Islamic Index return are shown in Figure 4.

Response to Cholesky One S.D. (d.f. adjusted) Innovations
Response of RJII to RJII



Response of RJII to MRP



Response of RJII to ER

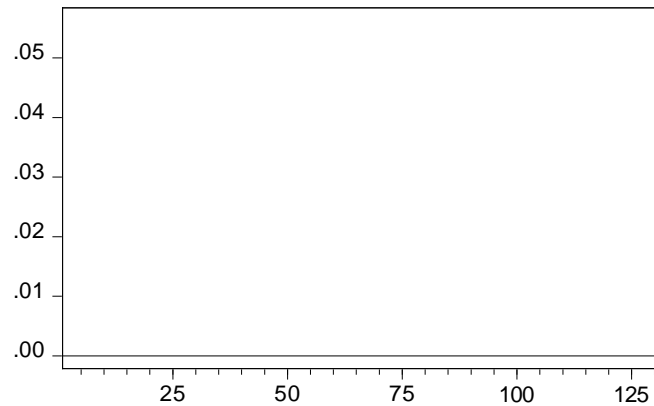


Figure 4: Result of Impulse Response Function

The figure shows RJII's response to shocks in the MRP and ER fluctuates. In the event of shocks to the market risk premium (MRP) then JII's return (RJII) will respond negatively or decreased in the second period of 0.000977, then fluctuations occur until the fifth period of 3.30E-06 before achieve stability in the sixth period until the end of the period.

If there is a shock to the exchange rate, the Jakarta Islamic Index returns will respond positively in the second period of 0.012158, then fluctuations occur until the eighth period of 7.09E-07, and achieve stability in the ninth period to the 132nd period.

f) *Forecast Error Variance Decomposition (FEVD)*

Forecast Error Variance Decomposition analysis results as shown in Figure 5.

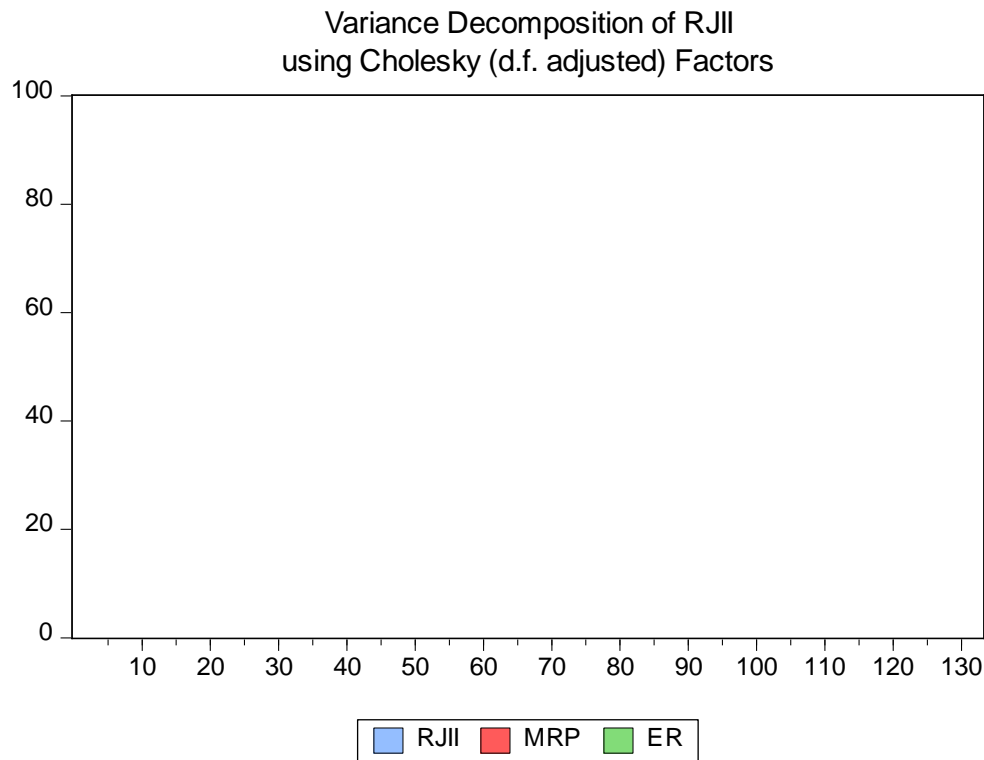


Figure 5: Result of Forecast Error Variance Decomposition

The figure 5 shows that in the first period, the contribution to variability of the return of Jakarta Islamic Index (RJII) 100% came from RJII itself. This percentage decreased gradually until the end of the period, but it was still very dominant, amounting to 95.91 percent in the 132nd month.

The second variable that contributes to RJII diversity is the exchange rate (ER), it emerged start of the second period. ER contributed to RJII diversity in the second period by 3.89 percent and slowly increased until the 132nd period. ER variable can explain RJII variability with a contribution of 3.95 percent at the end of the period.

The third variable that contributes to RJII diversity is Market Risk Premium (MRP). The contribution of this variable begins to appear in the second period. MRP can explain RJII variability with a contribution of 0.03 percent in the second period and slowly rises until the end of the period. MRP can explain RJII variability of 0.14 percent in the 132nd period.

VI. CONCLUSION

Based on the results of the analysis and testing of hypotheses that have been done about the effect of market risk premium and exchange rate on the return of Jakarta Islamic Index (JII) using the Vector Auto regression (VAR) method, it can be concluded that:

1. Market risk premium has no significant effect on the return of Jakarta Islamic Index in the period 2008 to 2018.

2. Rupiah exchange rate against USD affect positively significant on the return of Jakarta Islamic Index period 2008-2018.
3. Based on the result of the Impulse Response Function (IRF), it shows that if there is a shock at the market risk premium, JII's return will respond negatively and begin to stabilize in the 6th period until the end of the period. As for if there is a shock to the exchange rate, JII's return will respond positively and begin to stabilize in the 9th period until the end of the period.
4. The result of Forecast Error Variance Decomposition (FEVD) shows that the fluctuation in the return of Jakarta Islamic Index most dominant influenced by JII's return itself, followed by the exchange rate in the second and the market risk premium on the third. At the end of the period, the contribution of JII return variability of 95.91 came from JII's return itself, 3.95 percent of the exchange rate and 0.14 percent of the market risk premium.

From the results of the study above shows that the market risk premium does not significantly influence the Jakarta Islamic Index return. This is because the Jakarta Islamic Index shares are based on sharia principles that avoid the element of interest. So that the ups and downs in general economic conditions will not affect the return of the Jakarta Islamic Index listed on the Indonesia Stock Exchange. Then investors will be safer to invest in Jakarta Islamic Index shares compared to conventional shares.

While the exchange rate of Rupiah against USD has a significant positive effect on the return of the Jakarta Islamic Index. This indicates that the number of foreign investors who invested their capital in Jakarta Islamic Index shares is quite a lot. That is the level of foreign confidence towards Islamic stocks in Indonesia is quite good, so it can be pushed by developments in Indonesian sharia economy.

The suggestions for further research should be done by analyzing the effect of market risk premiums and exchange rates on other countries' sharia indexes or international sharia stock indexes with the addition of larger data.

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