ANALYSIS OF THE IMPACT OF MACROECONOMIC VARIABLES ON THE SHARIA INDEX OF INDONESIA

Rahmat Fitriansyah,[1*] Darwanto,[2]

[1][2] Fakultas Ekonomika dan Bisnis Universitas Diponegoro, Indonesia

[*]Corresponding author: rahmatfitriansyah0@gmail.com

| Information	Abstract:
	This study intends to analyze the impact of macroeconomic variables on the indonesian sharia stock index. using vector error correction modeling (VECM) and variable money supply, industrial production index, consumer price index, exchange rate, bank interest rates, and indonesian sharia bank certificates as independent variables. findings / originality: the results show that the industrial production index, the exchange rate has a significant positive effect and the variable money supply, the consumer price index, and the sharia bank indonesia certificate have a significant negative effect on ISSI. granger's causality results prove that only the money supply and industrial production index have causality, but there is a one-way relationship including the indonesian syariah bank certificate to the money supply, the exchange rate, and the consumer price index. bank interest rates on sharia indonesia bank certificates, sharia indonesia bank certificates against consumer price indexes and exchange rates, and industrial production index.

A. INTRODUCTION

The capital market is a financial institution that has an important role in managing state and community investment and is an important part of an indicator of the stability of Indonesia's macroeconomic conditions. The movement of fund mobility shows the movement of the intensity of the company in utilizing funds obtained from the capital market. Companies that get an injection of funds through the sale of shares, bonds and other forms of securities will add funds to meet the company's production inputs.

The production target will be fulfilled by the fulfillment of production inputs, this can optimize the benefits of production output. If the company's income rises will encourage an increase in public income and encourage the level of consumption of goods and services. In the end, in the aggregate economy, an increase in capital mobility in the capital market will improve the welfare of the community.

The development of investment in the capital market can be seen from the performance of the Composite Stock Price Index (CSPI), LQ45, Jakarta Islamic Index (JII), and the Indonesian Sharia Stock Index (ISSI) which shows the development of the actual conditions of the Islamic capital market in Indonesia. ISSI is an issuer's stock index that complies with Islamic regulations set by the capital market. The emergence of sharia products in the capital market initially started from the desire to accommodate the needs of Muslims who want to invest in sharia principles. Figure 1 shows the development of ISSI tends to increase from period to period despite a decline in the third quarter of 2013, and the second quarter of 2015. Meanwhile, in the third quarter of 2015 experienced a sharp decline but then could increase again until the end of 2018.

Figure 1: Development of the Indonesian Syariah Stock Index
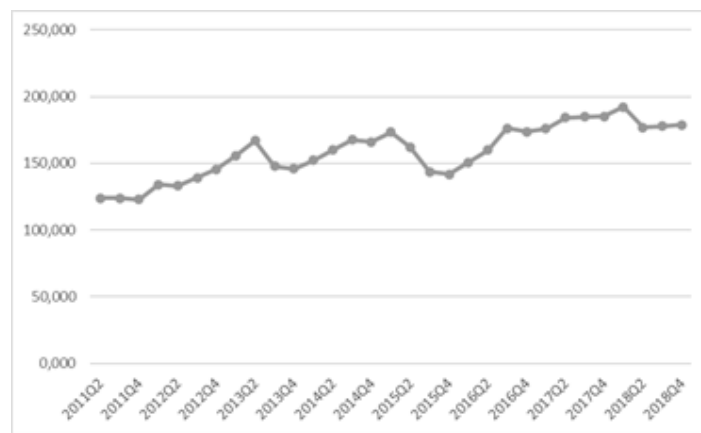
Source: Bursa Efek Indonesia (2019)

Sharia shares listed on the sharia securities list in Indonesia have increased very well by 73% since it was launched in 2011, which initially totaled 234 sharia shares and at the end of the observation period, there were 407 sharia shares registered. Besides, the value of the capitalization of the Indonesian Sharia Stock Index (ISSI) has experienced growth each year on the Indonesian stock exchange market. Table 1 shows a positive upward trend from 2011 to 2018. This shows that the performance of the Indonesian Syariah stock index has increased quite well.

Table 1: Capitalization Rate of Sharia Shares

Year	Indonesian Sharia Stock Index (Rp. Billion)
2011	1.968.091,37
2012	2.451.334,37
2013	2.557.846,77
2014	2.946.892,79
2015	2.600.850,72
2016	3.170.056,08
2017	3.704.543,09
2018	3.666.688,31

Source: Otoritas Jasa Keuangan (2019)

The development of ISSI during the study period was influenced by some macro variables such as the money supply (M2), the industrial production index (IPI), the consumer price index (CPI), the exchange rate of the rupiah against the dollar (KURS),

the BI interest rate (BI-rate) and Bank Indonesia Syariah Certificate (SBIS). An increase in the money supply affects the inflation rate, the inflation rate will encourage an increase in interest rates through the policy of increasing the BI discount rate or the BI rate. An increase in the BI rate will encourage a response to an increase in interest rates. Interest rates will increase investor expectations of earning income through deposits. On the other hand, rising interest rates reduce investors' expectations of earning income in the capital market, thereby reducing the mobility of funds in the capital market. This study aims to examine the effect of macroeconomic indicators on the Islamic stock index both in the short and long term. This research will contribute to the development of the Islamic capital market in Indonesia.

B. LITERATUR REVIEW

Several studies attempt to examine the effect of stock price indexes and macroeconomic variables both regionally and globally. Majid and Yusof (2009), Asmy et al. (2009), Savasa and Samiloglub (2010), Hosseini et al. (2011), Kuwomu and Victor (2011), Rad (2011), Hussin et al. (2012), Tangjitprom (2012), Hussin et al. (2012), Bekhet and Mugableh (2012), Majid et al. (2012), Pasaribu and Firdaus (2013), Krisna (2013), Beik and fatmawati (2014), Suciningtias and Khoiroh (2015), Ardana (2016), Barakat et al. (2016), and Sudarsono (2018) are some studies examining the effect of stock price indices and macroeconomic variables.

In these studies, the macroeconomic variable used is the industrial production index (IPI) which is proven to have a positive relationship with stock prices (Savasa and Samiloglub 2010). This is also consistent with the research of Hosseini et al. (2011), Hussin et al. (2012), Bekhet and Mugableh (2012), Majid et al. (2012), Beik and Fatmawati (2014). The increase in IPI will affect the share price through its impact on company profits.

The relationship between the Consumer Price Index (CPI) and stock prices can have a positive or negative effect. According to Bekhet and Mugableh (2012) the two variables have a negative relationship. They stated that the rise in CPI indicated rising prices for consumer goods, which meant an increase in the cost of living. This makes people choose to allocate funds for consumption rather than investment. As a result, the demand for shares in the capital market will decline. Low demand will make the

share price go down. However, several other studies have shown that the two variables have a positive relationship. Asmy et al. (2009), Hosseini et al. (2011), Kuwomu and Victor (2011), Hussin et al. (2012), Barakat (2016), Sudarsono (2018) found that CPI was positively related to stock prices.

Furthermore, the relationship between the money supply and the stock price can have a positive or negative effect. Yusof and Majid (2009), Savasa and Samiloglub (2010), Hosseini et al. (2011), Majid et al. (2012), Pasaribu et al. (2013) and Barakat (2016) show that when there is an increase in the money supply, the discount policy will reduce interest rates. In this case, it encourages investors to invest their funds in the capital market. The increase in investment that occurs in the capital market will affect the demand for shares. The more investments that occur will increase share prices as demand increases. But Asmy et al. (2009), Hussin et al. (2012), Bekhet and Mugableh (2012), Beik and Fatmawati (2014), and Sudarsono (2018) showed the opposite fact, where the relationship between the two variables was negative.

The exchange rate and stock prices can also have a positive or negative effect. Asmy et al. (2009), Savasa and Samiloglub (2010), Krisna (2013), and Barakat (2016) show a positive relationship between exchange rate variables and stock prices. But according to Yusof and Majid (2009), Kuwomu and Victor (2011), Kuwamu and victor (2011), Hussin et al. (2012), Tangjitprom (2012), Bekhet and Mugableh (2012), Majid et al. (2012), Suciningtias and Khoiroh (2015), Ardana (2016), and Sudarsono (2018), the relationship between the two variables was negative. This indicates that when the rupiah exchange rate depreciates, investors will divert their funds abroad so that capital outflows occur. The flow of funds abroad caused domestic investment to decline. This decrease has an impact on the reduced investment in shares in the domestic market so that share prices also decline.

According to the research of Kuwomu and Victor (2011), Hussin et al. (2012), Tangjitprom (2012), Barakat (2016), Ardana (2016), and Sudarsono (2018) interest rates have a negative effect on stock prices. This is due to the behavior of investors who tend to invest their funds in the form of investments other than shares, so the stock price goes down. This is in line with the sharia principle that interest rates are not a significant variable in explaining stock market volatility. This finding provides

further support that interest rates have no significant impact on the volatility of the Islamic stock market.

The level of Islamic bank Indonesia certificates and share prices can also have positive or negative effects. Ardana (2016) shows a positive relationship between SBB value variables and stock prices. But according to Beik and Fatmawati (2014) the relationship between the two variables is negative. This indicates that a higher level of SBIS will affect the level of profit sharing and bank financing. However, SBIS is not a sufficiently calculated part in determining the profit-sharing rate of Islamic banks. This situation makes the increase in SBIS, not the main consideration for investors to increase investment in the capital market.

While research conducted by Rad (2011) shows that the response of the stock price index in Iran to shocks in macroeconomic variables such as the consumer price index, the exchange rate, and the money supply, is very weak and takes four months to stabilize. Then the study also showed that macroeconomic variables such as the consumer price index, currency exchange rate and the amount of money in circulation fluctuated around 12 percent.

C. METHODOLOGY

Impact analysis of macroeconomic variables on the Indonesian Sharia Stock Index is seen using some variables, namely the Indonesian Sharia Stock Index (ISSI), the money supply (M2), the industrial production index (IPI), the consumer price index (CPI), the exchange rate of the rupiah against the dollar (KURS), BI interest rates (BI-rate), and Indonesian Sharia bank certificates (SBIS). The research model is:

$$LnISSI_t = \beta_0 + \beta_1 LnM2_{t-1} + \beta_2 LnIPI_{t-1} + \beta_3 LnIHK_{t-1} + \beta_4 LnKURS_{t-1} + \beta_5 BIrate_{t-1} + \beta_6 SBIS_{t-1} + \varepsilon_t$$

(1)

Types of data used in this study are secondary data in the form of monthly time series from May 2011 to December 2018. Data for this study were obtained from various sources including Indonesia Stock Exchange (IDX), Statistics Indonesia (BPS), Bank Indonesia (BI), the Financial Services Authority, and Bloomberg Terminal. The

data used is data that is the Indonesian Sharia Stock Index (ISSI), the money supply (M2), the industrial production index (IPI), the consumer price index (CPI), the exchange rate of the rupiah against the dollar (KURS), BI interest rates (BI-rate), and Indonesian Sharia bank certificate (SBIS).

This research uses descriptive and quantitative analysis methods. The analytical tool used in this study is the Vector Autoregression (VAR) method if the data used is stationary at the level. But if the data is not stationary at the level, then proceed with the Vector Error Correction Model (VECM) method. All data in this study were transformed into natural logarithms (ln) except the BI Rate and SBIS.

The Vector Autoregressive (VAR) model was introduced by Christopher Sims in 1980. Firdaus (2011) explained that if previously univariate autoregression was a single equation with a single variable linear model, where the present value of each variable is explained by its lag value, then VAR is an n-equation with n-variable, where each variable is explained by its lag value, as well as its current and past values (current and past values).

To see variations around a constant line on each time series variable a stationary test was performed. New time-series data can be said to be stationary if the data does not contain unit roots in other words that the mean, variance, and covariance are constant over time. Meanwhile, to see the cointegration between variables in this equation a cointegration test is performed. The cointegration test uses the Johansen test by estimating the maximum likelihood and to find the number of cointegration vector groups. If between ISSI, M2, IPI, CPI, EXCHANGE, BIRATE, and SBIS are cointegrated, the nature of the short-term relationship between variables can be expressed in the form of a vector error correction model (VECM).

This study uses Vector Autoregression (VAR) to determine the interdependence relationship between variables in time series data. VAR analysis is one of them to test the causality relationship between ISSI, M2, IPI, CPI, EXCHANGE, BIRATE and SBIS which is used to see the direction of the relationship between variables in the equation. To find out the causality relationship between variables the Granger causality test is used, with the following equation:

$$r_t = \sum ai\, Y_{t-i} + \sum bj\, X_{t-j} + v_t : \text{X cause Y if bj>0} \tag{2}$$

$$x_r = \sum ci\, Y_{t-i} + \sum dj\, X_{t-j} + u_t : \text{Y cause X if bj>0} \tag{3}$$

Where $\sum ai\, Y_{t-i}$ is the lag regression coefficient of variable Y if Y is the dependent variable and $\sum bj\, X_{t-j}$ is the lag regression coefficient of variable X if Y is the dependent variable. Where $\sum ci\, Y_{t\ i}$ as the regression coefficient lag variable Y if X is the dependent variable, $\sum dj\, X_{t-j}$ is the lag regression coefficient of variable X if X is the dependent variable, and; vt, ut is an independent random vector with a mean of zero and a finite covariance matrix.

To see the cointegration between two or several variables, the cointegration test was carried out using the maximum estimate of cohesion likehood proposed by Johansen to test whether there was cointegration between variables. In addition, Johansen's test is used to find the number of cointegration vector groups. If between ISSI, M2, IPI, CPI, EXCHANGE, BIRATE, and SBIS are cointegrated, then the vector error correction model (VECM) analysis is used.

Analysis of impulse response function (IRF) and variance decomposition (VD) is needed to determine the shock between ISSI, M2, IPI, CPI, EXCHANGE, BIRATE, and SBIS variables. IRF analysis is needed to determine the effect of a variable's shock on the variable itself and other variables in the equation. Meanwhile, to determine the level of contribution of a variable to changes in the variable itself and other variables in the coming periods the Variance Decomposition (VD) analysis is used.

This study aims to examine the effect of macroeconomic indicators on the Islamic stock index both in the short and long term. This research will contribute to the development of the Islamic capital market in Indonesia.

D.   RESULT AND ANALYSIS

Unit root tests can be performed with the Augmented Dickey-Fuller (ADF) test by comparing the statistical ADF value with the Mackinnon critical value. The data to be tested is data at the first difference level. If the statistical ADF value is smaller than the Mackinnon critical value, it means that there is a root unit or non-stationary data. Conversely, if the ADF statistical value is greater than the Mackinnon critical value

then it is concluded that the data does not contain a root unit. The large ratio between the ADF value and the Mackinnon critical value can be seen from the probability value at the level of α = 5%. Data stationarity test is an important step in analyzing time series data. Unit root test results at the level can be seen in Table 2.

Table 2: Unit Root Test Results at the Level

Variable	ADF Statistic	Nilai Kritis Mac Kinnon			Prob	Explanation
		1%	5%	10%		
Ln ISSI	-1.773050	-3.503879	-2.893589	-2.583931	0.3916	Not Stationary
Ln M2	-3.799582	-3.505595	-2.894332	-2.584325	0.0042	Stationary
Ln IPI	-1.196808	-3.505595	-2.894332	-2.584325	0.6730	Not Stationary
Ln IHK	-9.706931	-3.503879	-2.893589	-2.583931	0.0000	Stationary
Ln Kurs	-1.629939	-3.503879	-2.893589	-2.583931	0.4633	Not Stationary
Bi-Rate	-1.285641	-3.504727	-2.893956	-2.584126	0.6334	Not Stationary
SBIS	-1.465655	-3.508326	-2.895512	-2.584952	0.5462	Not Stationary

Source: *Eviews data processing results*

The results of the stationarity test data at the level show that all variables are not stationary except (M2) and (CPI) which are stationary at a 5% significance level. This is because the absolute value of t-ADF is smaller than the absolute value of MacKinnon Critical Values at the level of 5%. Research with non-stationary data can produce spurious regression. Therefore, the stationarity test is continued at the first difference level.

Table 3: Unit Root Test Results at the First Difference

Variabel	ADF Statistic	Nilai Kritis Mac Kinnon			Prob	Keterangan
		1%	5%	10%		
Ln ISSI	-8.493997	-3.504727	-2.893956	-2.584126	0.0000	Stationary
Ln M2	-11.65615	-3.504727	-2.893956	-2.584126	0.0001	Stationary
Ln IPI	-11.49211	-3.505595	-2.894332	-2.584325	0.0001	Stationary
Ln IHK	-9.139316	-3.506484	-2.894716	-2.584529	0.0000	Stationary
Ln Kurs	-7.369866	-3.504727	-2.893956	-2.584126	0.0000	Stationary
Bi-Rate	-6.330448	-3.504727	-2.893956	-2.584126	0.0000	Stationary
SBIS	-7.032557	-3.508326	-2.895512	-2.584952	0.0000	Stationary

Source: *Eviews data processing results*

Table 3 shows the ADF test at α = 5% ISSI, M2, IPI, CPI, EXCHANGE, BIRATE and SBIS levels at the first difference level, where the ADF statistical values of ISSI, M2, IPI, CPI, EXCHANGE, BIRATE, and SBIS are absolutely greater than MacKinnon critical value. The probability value of each variable in the ADF test shows a value smaller

than α = 5% or stationary. With the results of stationarity on each variable, the analysis that is feasible to use is the VAR or VECM analysis.

The second step in the VAR analysis is determining the optimum lag. Determination of the number of lags in the VAR model is determined by the information criteria recommended by the smallest value of Final Prediction Error (FPE), Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn (HQ). The optimum lag test results in Table 4 show that all asterisks are in lag 2. Thus, lag 2 is the optimum lag that is used at all stages in the VAR analysis.

Table 4: Optimum Lag Test Results

Lag	LogL	LR	FPE	AIC	SC	HQ
0	593.0718	NA	3.87e-15	-13.31981	-13.12275*	-13.24042*
1	665.8299	132.2875	2.26e-15	-13.85977	-12.28328	-13.22464
2	716.7089	84.41283*	2.21e-15*	-13.90247*	-10.94656	-12.71161
3	757.4684	61.13930	2.81e-15	-13.71519	-9.379851	-11.96859

Source: *Eviews data processing results*

Granger causality test is used to see the direction of the relationship between ISSI, M2, IPI, CPI, EXCHANGE, BIRATE and SBIS variables. The presence or absence of a relationship can be seen from the probability value of each causality test. Table 5 shows that the one-way relationship is between ISSI to M2, ISSI to Exchange, Exchange to IPI, SBIS to CPI, and Bi-rate to SBIS. Meanwhile, M2 with IPI has a two-way relationship.

Granger causality test between ISSI and M2 variables shows that M2 does not cause ISSI, while ISSI affects M2. The money supply does not affect the amount of ISSI because M2 is relatively stable in the study period so the effect on ISSI is not so apparent. On the other hand, the size of ISSI affects the level of M2 because M2 rises and falls will affect investors to hold their consumption to capital market investment. The situation will affect the level of investors which ultimately affects the stock price.

Granger causality test between ISSI and Exchange rates variables shows that Exchange rates do not cause ISSI, while ISSI affects Exchange Rates. The exchange rate of the rupiah against the dollar does not affect the amount of ISSI because the exchange rate is relatively stable in the study period so that the effect on ISSI is not so visible. On the other hand, the ISSI magnitude influences exchange rates because

rising and falling exchange rates will influence investors to shift their investment into or outside the country. This situation will affect the investor's interest to invest in the Indonesian capital market so that it affects the domestic share price

IPI does not affect KURS as indicated by the Granger causality test between KURS and IPI. But the rate of EXCHANGE affects the IPI level. An increase in the exchange rate can cause production costs to rise to make efficiency and cut costs to cope with rising production costs. Rising exchange rates are also accompanied by rising prices of goods on the market impact on production capabilities.

SBIS causes CPI and vice versa is shown from the results of the Granger causality test. The increase in CPI or inflation shows that people prefer to use their funds for consumption rather than investment. BI will increase the level of profit sharing or interest through SBI and SBIS to reduce the money supply in the community. If interest rates or profit-sharing increase, people will tend to choose to invest funds in the form of savings or deposits rather than being used for spending.

Table 5: Granger Causality Test Results

Null Hypothesis:	Prob.	Test result	Causality Relations
LN_M2 does not Granger Cause	0.0653	Receive HO	One-way relationship
LN_ISSI	0.0156	Reject HO	from ISSI to M2
LN_ISSI does not Granger Cause	0.2254	Receive HO	There is no relationship
LN_M2	0.4364	Receive HO	between ISSI with IPI
LN_IPI does not Granger Cause LN_ISSI	0.8593	Receive HO	There is no relationship
LN_ISSI does not Granger Cause LN_IPI	0.4703	Receive HO	between ISSI with CPI
LN_IHK does not Granger Cause	0.2378	Receive HO	One-way relationship
LN_ISSI	0.0004	Reject HO	from ISSI to Ex rate
LN_ISSI does not Granger Cause	0.6874	Receive HO	There is no relationship
LN_IHK	0.2593	Receive HO	between ISSI with Bi rate
LN_ER does not Granger Cause LN_ISSI	0.9707	Receive HO	There is no relationship
LN_ISSI does not Granger Cause LN_ER	0.8925	Receive HO	between ISSI with SBIS
BI_RATE does not Granger Cause	0.0370	Reject HO	Two-way relationship
LN_ISSI	1.E-06	Reject HO	between M2 with IPI
LN_ISSI does not Granger Cause	0.8917	Receive HO	There is no relationship
BI_RATE	0.4661	Receive HO	between M2 with IHK
SBIS does not Granger Cause LN_ISSI	0.7760	Receive HO	There is no relationship
LN_ISSI does not Granger Cause SBIS	0.2588	Receive HO	between M2 with Ex rate
LN_IPI does not Granger Cause LN_M2	0.6302	Receive HO	There is no relationship
LN_M2 does not Granger Cause LN_IPI	0.9241	Receive HO	between M2 with Bi rate
LN_IHK does not Granger Cause	0.7478	Receive HO	There is no relationship
LN_M2	0.9987	Receive HO	between M2 with SBIS
LN_M2 does not Granger Cause	0.3485	Receive HO	There is no relationship

LN_IHK	0.8961	Receive H0	between IPI with IHK
LN_ER does not Granger Cause LN_M2	0.0267	Reject H0	One-way relationship
LN_M2 does not Granger Cause LN_ER	0.1361	Receive H0	from Ex rate to IPI
BI_RATE does not Granger Cause	0.7503	Receive H0	There is no relationship
LN_M2	0.2470	Receive H0	between IPI with Bi rate
LN_M2 does not Granger Cause	0.8140	Receive H0	There is no relationship
BI_RATE	0.0618	Receive H0	between IPI with SBIS
SBIS does not Granger Cause LN_M2	0.8924	Receive H0	There is no relationship
LN_M2 does not Granger Cause SBIS	0.9778	Receive H0	between IHK with Ex
LN_IHK does not Granger Cause LN_IPI	0.7295	Receive H0	rate
LN_IPI does not Granger Cause LN_IHK	0.9883	Receive H0	There is no relationship
LN_ER does not Granger Cause LN_IPI	0.0005	Reject H0	between IHK with Bi rate
LN_IPI does not Granger Cause LN_ER	0.5387	Receive H0	One-way relationship
BI_RATE does not Granger Cause	0.7117	Receive H0	from SBIS to IHK
LN_IPI	0.9866	Receive H0	There is no relationship
LN_IPI does not Granger Cause	0.6822	Receive H0	between Ex rate with Bi
BI_RATE	0.2070	Receive H0	rate
SBIS does not Granger Cause LN_IPI	0.0729	Receive H0	There is no relationship
LN_IPI does not Granger Cause SBIS	0.0257	Reject H0	between Ex rate with
LN_ER does not Granger Cause LN_IHK			SBIS
LN_IHK does not Granger Cause LN_ER			One-way relationship
BI_RATE does not Granger Cause			from Birate to SBIS
LN_IHK			
LN_IHK does not Granger Cause			
BI_RATE			
SBIS does not Granger Cause LN_IHK			
LN_IHK does not Granger Cause SBIS			
BI_RATE does not Granger Cause			
LN_ER			
LN_ER does not Granger Cause			
BI_RATE			
SBIS does not Granger Cause LN_ER			
LN_ER does not Granger Cause SBIS			
SBIS does not Granger Cause BI_RATE			
BI_RATE does not Granger Cause SBIS			

Source: Eviews data processing results

Granger causality test results between SBIS and BIRATE show that Bi-rate causes SBIS. The increase in Islamic Bank Indonesia Certificates does not affect BI policy to determine the BI Rate level. SBIS by using the principle of wadiah or deposit provides compensation for banks that buy SBIS in the form of bonuses. The bonus is determined by BI to the bank holding SBIS and the amount of the SBIS bonus is influenced by BI policy at the BI rate level.

148

Figure 2: VAR Stability Testing Plot Results

Inverse Roots of AR Characteristic Polynomial
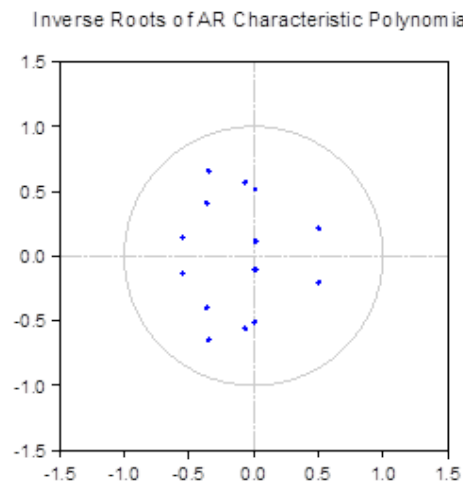
The VAR system is said to be stationary if all its roots have a modulus located inside the unit circle. The stability test in Figure 2 shows the modulus ranging from 0.108002 to 0.736997 which can be concluded that the VAR model is stable so that the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) produced are considered valid. Cointegration test can be done using the Johansen method. The conclusion drawn is based on a comparison between the Trace Statistics value with a critical value at α = 5%, and by looking at the probability value to show whether there is an equation in a cointegrated system.

The cointegration test results in Table 6 show the value of the Trace Statistics from the Trace test of 187.2316 is greater than the critical value at α = 5% of 125.6154 which means that in the system there is one cointegrated equation. The Trace Statistics value is 134.6810 which is greater than the critical value of 95.75366. Whereas at most 3 shows the Trace Statistics of 87,66282 which is greater than the critical value of 69.81889 which means that in the system there are 2 cointegrated equations.

Table 6: Johansen Cointegration Test Results

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.442279	187.2316	125.6154	0.0000
At most 1 *	0.406919	134.6810	95.75366	0.0000
At most 2 *	0.362147	87.66282	69.81889	0.0010
At most 3	0.235110	47.19462	47.85613	0.0576
At most 4	0.133075	23.07249	29.79707	0.2425
At most 5	0.091106	10.22026	15.49471	0.2642
At most 6	0.017870	1.622864	3.841466	0.2027

Source: Eviews data processing results

Cointegration testing through Johansen Co Integration Test shows that in six variables namely ISSI, M2, IPI, CPI, EXCHANGE, BIRATE, and SBIS there is a long-term or cointegrated relationship. Thus, in this study the VECM analysis was applied. VECM is able to see long-term relationships and the existence of short-term dynamics of endogenous variables so that they converge into their cointegration relationships. To determine the relationship between variables in the VECM estimation the significance test was used.

Table 7: Long-Term Regression Test Results

Cointeg Eq:	Coeffisien	Std Error	t stat
LN_ISSI(-1)	1.000000		-
LN_M2(-1)	-2.048888	(0.66296)	[-3.09052]*
LN_IPI(-1)	1.563853	(0.77156)	[2.02686]*
LN_IHK(-1)	-0.208265	(0.04139)	[-5.03227]*
LN_EX_RATE(-1)	1.577417	(0.72908)	[2.16357]*
BI_RATE(-1)	0.017979	(0.03225)	[0.55752]
SBIS(-1)	-0.071589	(0.02369)	[-3.02133]*
C	16.04717		-

Source: Eviews data processing results

Table 7 is the result of a long-term VECM test that shows the relationship of independent variables with ISSI. Variables that affect ISSI significantly, in the long run, are M2, IPI, CPI, EXCHANGE, and SBIS. Meanwhile, the variables M2 (-1), CPI (-1), and SBIS (-1) have a negative effect on $\alpha = 5\%$, while the Bi-rate (-1) is not significant on ISSI. M2 variable has the highest influence on the level of ISSI compared to other variables, with a coefficient of -2.048888% followed by ER, IPI, CPI, and SBIS. The increase in M2 encourages an increase in inflation which results in an increase in the

interest rate and profit-sharing. An increase in the interest rate and profit sharing will attract investors to save their funds to deposit. This situation makes the demand for investors to hold shares declined. These results are following the findings of Asmy et al. (2009), Hosseini et al. (2011), Bekhet and Mugableh. (2012), Hussin et al. (2012), Beik and Fatmawati (2014), and Sudarsono (2018).

Table 8: Short-term VECM Test Results

Cointeg Eq:	Coeffisien	Std Error	t stat
CointEq1	-0.089495	(0.04720)	[-1.89599]
D(LN_ISSI(-1))	0.162510	(0.12678)	[1.28180]
D(LN_ISSI(-2))	0.057561	(0.13550)	[0.42480]
D(LN_M2(-1))	-0.226817	(0.42551)	[-0.53305]
D(LN_M2(-2))	-0.299098	(0.41284)	[-0.72449]
D(LN_IPI(-1))	0.003664	(0.12340)	[0.02969]
D(LN_IPI(-2))	-0.073609	(0.13387)	[-0.54984]
D(LN_IHK(-1))	-0.012520	(0.00842)	[-1.48711]
D(LN_IHK(-2))	-0.004554	(0.00558)	[-0.81645]
D(LN_EX_RATE(-1))	0.219758	(0.30967)	[0.70964]
D(LN_EX_RATE(-2))	0.090808	(0.29157)	[0.31144]
D(BI_RATE(-1))	-0.032768	(0.02239)	[-1.46343]
D(BI_RATE(-2))	0.035853	(0.02217)	[1.61731]
D(SBIS(-1))	-0.007826	(0.00496)	[-1.57917]
D(SBIS(-2))	-0.006250	(0.00457)	[-1.36648]
C	0.005767	(0.00711)	[0.81096]

Source: Eviews data processing results

The IPI variable in the first lag has a positive effect of 1.563853%. This result is following the results of Hosseini et al. (2011), Hussin et al. (2012), Bekhet and Mugableh (2012), Majid et al. (2012), Beik and Fatmawati (2014) who showed a positive relationship between IPI and ISSI. An increase in production output will increase company profits, which affects investor interest in investing in the stock market which has an impact on increasing the value of ISSI. In the end, increasing share prices and encouraging the growth of the real sector and positive growth on the performance of companies, especially those listed on the stock exchange, will trigger an increase in the company's stock prices.

The CPI variable in the first lag has a negative effect of 0.208265%. These results are consistent with the results of Bekhet and Mugableh (2012), Sucinigtias (2015) which show a negative relationship between CPI and ISSI. An increase in

inflation causes an increase in prices in general. This condition makes the community have to pay more to fulfill their needs because the price is rising and the purchasing power of the people is getting lower, this has led to a decline in investment interest. The weak purchasing power of the people will affect the level of sales and profitability which results in a decline in the company's stock price. The decline in the company's stock price is considered less attractive and less profitable for investors because the return that will be distributed by the company to shareholders will also decrease. As a result, the demand for shares in the capital market fell and resulted in a decline in share prices in the capital market so that ISSI will decrease

The exchange rate variable or ER has a positive effect of 1.577417% on ISSI. Similar results were found by Asmy et al. (2009), Savasa and Samiloglub (2010), Krisna (2013), and Barakat et al. (2016). Exchange rates may have a positive or negative relationship with stock prices depending on the nature of the economy. For economies that are dominated by net exports, then when currency depreciation leads to an increase in the value of net exports because domestic products become cheaper on the world market and can compete. Causing an increase in company profitability which is reflected in the value of the stock. However, for an economy that is heavily dependent on imports, depreciation of the currency can cause higher import prices to cause a decline in corporate profits and lower share prices. The net effect of currency depreciation will be to encourage an increase in the flow of foreign investment in the country.

SBIS variable has a significant and positive effect on ISSI level. Similar results were found by Beik and Fatmawati (2014). The SBIS bonus does not significantly affect investors in investing in ISSI, because SBIS is an instrument that is in a different market and indicates that SBIS in the eyes of investors is a substitute instrument for ISSI.

The Bi-Rate variable has no effect on the level of ISSI or among the variables in the Bi-Rate equation has the lowest impact in influencing the level of ISSI. Bi-Rate interest rate policy has no influence on investors in deciding to invest directly in ISSI despite having a positive relationship. This is driven by differences in the basic principles of ISSI based on sharia, where interest rates are instruments that are not sharia-compliant.

VECM estimation results show that ISSI in the first lag has a negative and significant effect on M2 at alpha 0.1, which is indicated by the t-value of -2.38355> 1,663. An increase in M2 by 1 percent affected ISSI's decline by 0.009754 percent. This situation shows that when an increase in the money supply will encourage an increase in interest rates. An increase in the interest rate will be responded positively by investors who will invest their funds in the form of savings or deposits. The increase in interest rates into investment in the capital market is less attractive to investors so that demand for shares will decline and share prices will decline.

IRF analysis is used to determine the effect of the shock or shock of a variable on the variable itself and other variables in the equation. IRF describes the impact of the shock or shock of a variable on other variables so that it can be seen how long the effect of shock of a variable on other variables. Also, IRF can be used to find out which variables will give the biggest response to shock.

Figure 3: Impulse Response Function (IRF) Graph
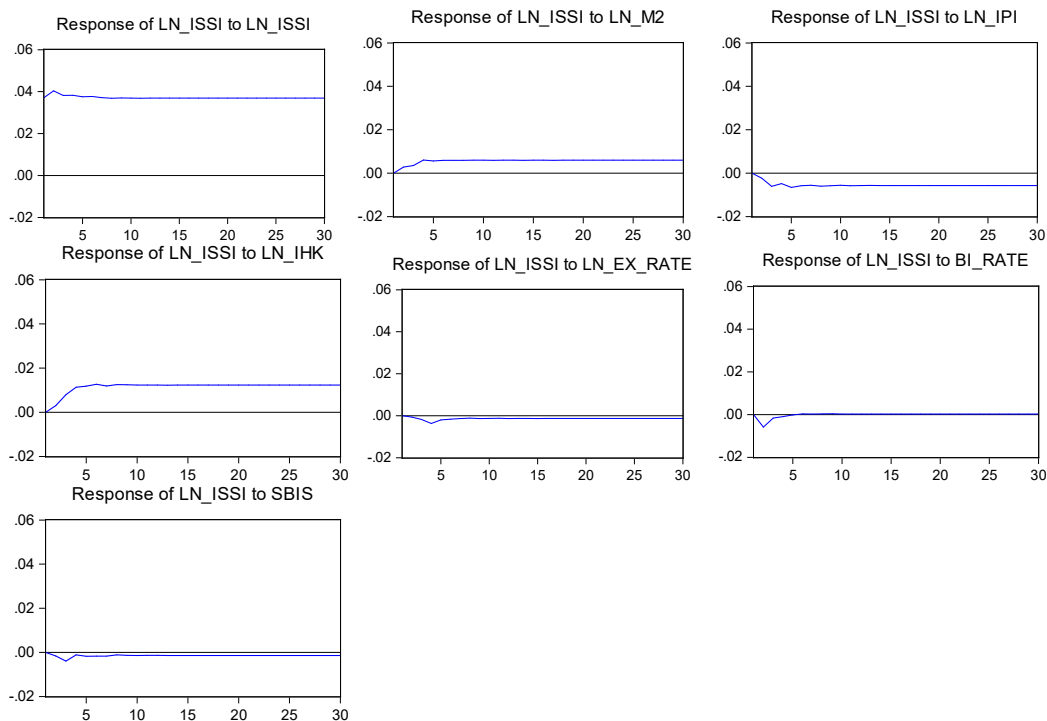
Source: Eviews data processing results

The vertical axis in the IRF shows the standard deviation values used to measure how much response will be given by a variable if there is a shock to other

153

variables. Then, the horizontal axis shows the length of the period of the response given to the shock. If the response given above the horizontal axis indicates that the shock will have a positive effect. Conversely, if the response given is below the horizontal axis shows that the shock will have a negative effect. Figure 3 shows the IRF graph of each variable as a response.

From Figure 3, which shows the results of the Impulse Response Function (IRF), it can be seen that shocks to ISSI by one standard deviation in the first month will increase ISSI by 3.7099% and continue to increase until the 2nd month. ISSI response decreased in the 3rd to 7th month and began to reach a stable point in the 8th month with a value of 3.6812% until the end of the observation month. The variable money supply (M2) shock in the first month did not seem to have been responded to by ISSI. In the second month, ISSI responded positively by 0.2778% and continued to increase until the 6th month by 0.05936% and was stable in the 7th month until the end of the observation month. IPI variable shocks responded negatively by ISSI, IPI variable began to reach a stable point in the 12th month of 0.05746% until the end of the observation month.

The CPI variable shock of one standard deviation in the first month did not appear to have been responded to by ISSI. In the second month, ISSI responded positively by 0.03040%. ISSI response began to reach a stable point at the 10th month of 0.12309% until the end of the observation month. Exchange rate variable shocks of one standard deviation in the first month do not appear to have been responded to by ISSI. In the second month, ISSI responded negatively by 0.00685%. ISSI response began to reach a stable point at the 12th month of 0.01334% until the end of the observation month.

Bi-rate variable shocks in the first month did not seem to have been responded to by ISSI. In the second month, ISSI responded negatively by 0.05878%. ISSI response began to reach a stable and positive point in the 16th month by 0.00253% until the end of the observation month. The SBIS variable shock in the first month did not seem to have been responded to by ISSI. In the second month, ISSI responded negatively by 0.01661%. ISSI response began to reach a stable point in the 13th month of 0.01424% until the end of the observation month.

From the above explanation, it can be concluded that ISSI reaches stability most quickly when responding to shocks that occur with respect to the amount of money in circulation, compared to other variables.

From the results of FEVD on ISSI, it can be seen that in the first month, the contribution to the ISSI index variability was 100 percent derived from ISSI itself. This percentage then decreases gradually until the end of the observation period. Then in the 4th month, CPI was the variable with the biggest contribution to the diversity of ISSI, which was 3.18 percent. This condition persisted until the 30th month where the CPI remained the variable with the greatest contribution to the diversity of ISSI, which was 8.66 percent.

Table 9: Variance Decomposition of the LNISSI Variables

Period	S.E.	LN_ISSI	LN_M2	LN_IPI	LN_IHK	LN_ER	BI_RATE	SBIS
1	0.037099	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.055369	98.03062	0.251776	0.183720	0.301544	0.015306	1.127000	0.090035
3	0.068252	95.83200	0.434437	0.905747	1.553598	0.077250	0.798941	0.398030
4	0.079539	93.68993	0.903142	1.037796	3.180743	0.274646	0.601118	0.312619
5	0.089216	92.19372	1.117066	1.371937	4.282931	0.269587	0.478013	0.286742
6	0.098051	91.08906	1.291344	1.488059	5.216733	0.250996	0.396725	0.267079
7	0.105867	90.45702	1.422310	1.557956	5.733850	0.232484	0.340811	0.255574
8	0.113106	89.84179	1.516218	1.644545	6.249317	0.214115	0.299375	0.234642
9	0.119953	89.38637	1.595428	1.693990	6.632216	0.202711	0.267254	0.222031
10	0.126383	89.04541	1.661660	1.722454	6.923082	0.193142	0.241090	0.213161
11	0.132503	88.75426	1.710829	1.760040	7.165811	0.184572	0.219797	0.204687
12	0.138367	88.51549	1.754458	1.786443	7.365439	0.178557	0.201957	0.197659
13	0.143983	88.32180	1.790415	1.805958	7.529536	0.173166	0.186801	0.192319
14	0.149394	88.14961	1.820679	1.825805	7.674260	0.168435	0.173807	0.187405
15	0.154618	88.00136	1.847576	1.842718	7.798019	0.164585	0.162545	0.183199

Source: Eviews data processing results

Figure 4: Forecasting Error Variance Decomposition Test Results
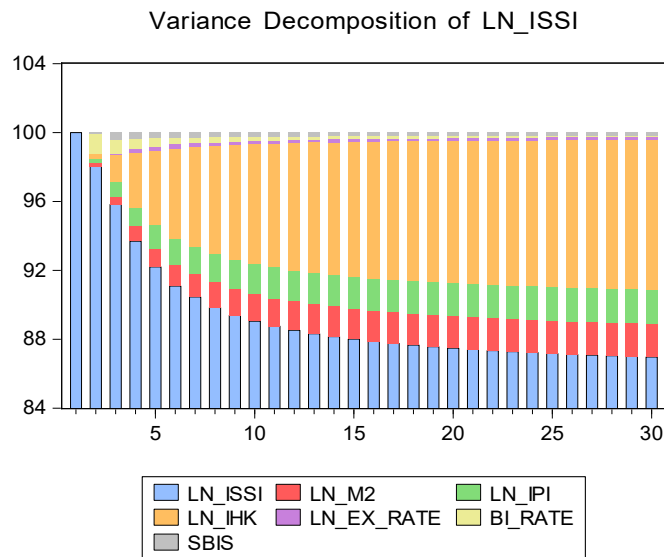

Variance Decomposition of LN_ISSI

Table 9 shows that other variables outside the CPI also contribute to the diversity of ISSI with different values indicating that at the end of the observation period, or at the 30th month, the BI Rate contributed 0.08 percent, ER 0.13 percent, IPI by 1.95 percent, M2 by 2.03 percent and SBIS by 0.15 percent. The interesting thing from this result is the continued contribution of Bank Indonesia's interest rates to the diversity of ISSI. This shows the behavior of investors who are not fully loyal to sharia, so they still compare the benefits of investing in the Islamic capital market with those in conventional money markets.

E.   CONCLUSION

Based on the results of the VECM estimation, in the short term, there are no variables that significantly influence ISSI, whereas in the long run the variable money supply (M2), consumer price index (CPI), and Indonesian Sharia bank certificates (SBIS) have a significant and negative effect. towards ISSI. The industrial production index (IPI) and exchange-rate (KURS) variables have a significant and positive effect on ISSI, while the BI interest rate (BI-rate) has no significant effect on ISSI.

Granger causality test shows that there is no causality relationship between ISSI and M2, IPI, CPI, ER, BIRATE, and SBIS. However, there is a one-way relationship

between ISSI and M2, ISSI and Ex-rate, Ex-rate and IPI, SBIS and CPI, Bi-rate and SBIS. Meanwhile, M2 with IPI has a two-way relationship. In the Long-term VECM estimation, it is found that the increase in M2 drives an increase in inflation which results in an increase in the interest rate and profit-sharing. An increase in the interest rate and profit sharing will attract investors to save their funds to deposit. This situation makes the demand for investors to hold shares declined. The increase in prices due to inflation makes the costs incurred in meeting the needs and makes people prefer holding money rather than saving in banks and also investments.

IRF results show that the development of ISSI responds positively and negatively to macroeconomic variable shocks. Shocks The money supply (M2), and the consumer price index (CPI) responded positively by ISSI. The Industrial Production Index variable, the exchange rate of the rupiah against the dollar (KURS), and the Indonesian Sharia bank certificate (SBIS) responded negatively by ISSI. The variable BI interest rate (BI-rate) responded negatively at the beginning of the period and positive during the sixth period by ISSI. IRF analysis shows ISSI's response to other variables shows that in the coming 30 months, the highest response is ISSI's response to CPI, which is expected to be stable at the eighth standard deviation. The next highest response is the response of ISSI to M2, IPI, SBIS, Bi-rate and ER shock, which will each be stable at the sixth and tenth standard deviations. ISSI's response to Bi-rate approaches zero standard deviation.

Based on the results of the Forecast Error Variance Decomposition (FEVD) analysis, the Indonesian Sharia Stock Index (ISSI) variable itself that most affected the development of ISSI by 86.96483 percent. The next dominant influential variable is the consumer price index (CPI) of 8.668648 percent. This shows ISSI and consumer price index contribute to explain the variability of the Indonesian Sharia Stock Index (ISSI). The variable that is expected to have the largest contribution to ISSI in the next thirty months is ISSI itself, followed by the contributions of CPI, M2, IPI, SBIS, ER, and BIRATE.

The results of the study show that the level of M2, IPI, CPI, ER, BIRATE , and SBIS affects the amount of ISSI. Whereas M2, IPI, CPI, ER, BIRATE, and SBIS levels are influenced by monetary instruments issued by Bank Indonesia. Therefore to develop sharia-based stock indexes, such as JII and ISSI, Bank Indonesia needs to develop

sharia-based monetary instruments. For further research, it is necessary to consider including dummy variables, such as government policies and important events during the study period in the model to get a more comprehensive observation of the development of Islamic stock indexes in Indonesia.

From the results of the above research, three policy recommendations can be taken. First, from the VECM results, it is known that the CPI instrument has a long-term relationship with the Islamic stock market, where the CPI is positively and significantly related to ISSI. With facts like this, it is necessary to maintain the level of inflation in society and the need for education in the face of rising prices of goods, so that the inflation rate can be maintained. Both of these authorities need to educate investors appropriately and effectively that the SBIS and ISSI instruments are not substituting instruments so that they have the potential to weaken each other. Thus, it is hoped that investors will make these SBIS and ISSI investment instruments that are complementary, or complement each other and strengthen one another.

Second, the need to strengthen the real sector of the economy. The results of VECM and FEVD are proof that the IPI variable has a very strategic position because IPI has a significant positive long-term relationship with ISSI, and contributes to the diversity of ISSI by 1.84 percent. Therefore, the government must be able to maintain the growth momentum of this real sector, because it will greatly affect the performance of the national sharia stock market. An effective and efficient formulation needs to be formulated to minimize the influence of interest rates on the Islamic capital market, especially on ISSI, because research results show that the BI Rate still contributes to the diversity of ISSI by 0.08 percent even though it has no significant relationship with ISSI in the long term.

F.   REFERENCES

Anita, A., Humaemah, R., & Suganda, A. D. (2020). Pengujian Beta Konsumsi dan Implikasinya Terhadap Imbal Hasil Saham Syariah di Indonesia dengan Mempertimbangkan Variabel Makro Ekonomi. *Esensi: Jurnal Bisnis dan Manajemen*, *10*(2), 181-190.

Ardana, Y. (2016, 5 17). Pengaruh Variabel Makroekonomi terhadap Indeks Saham Syariah di Indonesia: Model ECM. *ESENSI, 6*(1).

Asmy, Mohamed, Rohilina, Wisam, Hassama, Aris, & Fouad. (2009). Effects of Macroeconomic Variables on Stock Prices in Malaysia: An Approach of Error Correction Model. *Munich Personal RePEc Archive.*

Bank Indonesia. (2019). *Data BI 7-Day Repo Rate 2011.5-2018.12.* Bank Indonesia, Jakarta.

Bank Indonesia. (2019). *Data Indeks Harga Konsumen Bulanan 2011-2018.* Bank Indonesia, Jakarta.

Bank Indonesia. (2019). *Data Indeks Produksi Industri 2011-2018.* Bank Indonesia, Jakarta.

Bank Indonesia. (2019). *Data Jumlah Uang Beredar Bulanan 2011-2018.* Bank Indonesia, Jakarta.

Bank Indonesia. (2019). *Hasil Lelang Sertifikat Bank Indonesia Syariah 2011.5-2018.12.* Bank Indonesia, Jakarta.

Bank Indonesia. (2019). *Kalkulator Kurs Transaksi Tengah IDR-USD 2011.5-2018.12.* Bank Indonesia, Jakarta.

Bank Indonesia. (2019). *The Special Data Dissemination Standard*. Retrieved from Bank Indonesia: https://www.bi.go.id/sdds/

Barakat, M., Elgazzar, S., & Hanafy, K. (2016, 12 24). Impact of Macroeconomic Variables on Stock Markets: Evidence from Emerging Markets. *International Journal of Economics and Finance, 8*(1), 195-207.

Beik, I., & Fatmawati, S. (2014). Irfan Syauqi Beik: Pengaruh Indeks Harga Saham Syariah Internasional PENGARUH INDEKS HARGA SAHAM SYARIAH INTERNASIONAL DAN VARIABEL MAKRO EKONOMI TERHADAP JAKARTA ISLAMIC INDEX. *Al-Iqtishad, 6*(2), 155-178.

Bekhet, H., & Mugableh, M. (2012, 9 5). Investigating Equilibrium Relationship between Macroeconomic Variables and Malaysian Stock Market Index through Bounds Tests Approach. *International Journal of Economics and Finance, 4*(10), 69-81.

Bursa Efek Indonesia. (2019). *Data Publication IDX Monthly Statistics 2011.5 – 2018.12.* Bursa Efek Indonesia, Jakarta.

Firdaus, M. (2011). *Aplikasi Ekonometrika untuk Data Panel dan Time Series.* Bogor: IPB Press.

Gujarati, D. (2006). *Dasar-Dasar Ekonometrika* (Edisi Ketujuh ed.). Jakarta: Erlangga.

Hosseini, S., Ahmad, Z., & Lai, Y. (2011, 10 19). The Role of Macroeconomic Variables on Stock Market Index in China and India. *International Journal of Economics and Finance, 3*(6), 233-243.

Hussin, M., Fidlizan, M., Hussin, M., & Razak, A. (2012). The Relationship between Oil Price, Exchange Rate and Islamic Stock Market in Malaysia. *Research Journal of Finance and Accounting www.iiste.org ISSN, 3*(5), 83-92.

Hussin, M., Muhammad, F., Abu, M., & Awang, S. (2012). Macroeconomic Variables and Malaysian Islamic Stock Market: A Time Series Analysis. *Journal of Business Studies Quarterly, 3*(4), 1-13.

Krisna, A., & Wirawati, N. (2013). PENGARUH INFLASI, NILAI TUKAR RUPIAH, SUKU BUNGA SBI PADA INDEKS HARGA SAHAM GABUNGAN DI BEI. *E-Jurnal Akuntansi Universitas Udayana, 3*(2), 421-435.

Kuwornu, J. (2011). Macroeconomic Variables and Stock Market Returns: Full Information Maximum Likelihood Estimation. *Research Journal of Finance and Accounting, 2*(4), 49-63.

Majid, M., & Yusof, R. (2009, 5 22). Long-run relationship between Islamic stock returns and macroeconomic variables: An application of the autoregressive distributed lag model. *Humanomics, 25*(2), 127-141.

Otoritas Jasa Keuangan. (2019). *Laporan Statistik Pasar Modal Syariah Indonesia 2011-2018.* Direktorat Pasar Modal Syariah – Otoritas Jasa Keuangan, Jakarta.

Pasaribu, R., & Firdaus, M. (2013). ANALISIS PENGARUH VARIABEL MAKROEKONOMI TERHADAP INDEKS SAHAM SYARIAH INDONESIA. *Jurnal Ekonomi dan Bisnis (JEB), 7*(2), 117-132.

Rad, A. (2011). MACROECONOMIC VARIABLES AND STOCK MARKET: EVIDENCE FROM IRAN. *INTERNATIONAL JOURNAL OF ECONOMICS AND FINANCE STUDIES, 3*(1), 1-10.

Savasa, B., & Samiloglub, F. (2010). THE IMPACT OF MACROECONOMIC VARIABLES ON STOCK RETURNS IN TURKEY: AN ARDL BOUNDS TESTING APPROACH. *Afyon Kocatepe Üniversitesi, İ.İ.B.F. Dergisi*, 111-122.

Suciningtias, S., & Khoiroh, R. (2015). ANALISIS DAMPAK VARIABEL MAKRO EKONOMI TERHADAP INDEKS SAHAM SYARIAH INDONESIA (ISSI). *2nd Conference in Business, Accounting, and Management, 2*(1), 398-412.

Sudarsono, H. (2018, 8 9). Indikator Makroekonomi dan Pengaruhnya Terhadap Indeks Saham Syariah di Indonesia. *Esensi: Jurnal Bisnis dan Manajemen, 8*(2).

Tangjitprom, N. (2012, 4 14). Macroeconomic Factors of Emerging Stock Market: The Evidence from Thailand. *International Journal of Financial Research, 3*(2).