

VECTOR AUTOREGRESSION: THE RELATIONSHIP BETWEEN MACRO AND MICROECONOMICS

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Abstract: The research was conducted to see the relationship and influence of the rupiah exchange rate, non-performing financing, financing to deposits, and islamic bank profits. This study used time seris data, which was taken from the Financial Services Authority website. The method used in the study was Vector Auto Regression (VAR). The results of the research obtained are that there is a reciprocal relationship between the Rupiah Exchange Rate, Non-Performing Financing, Financing To Deposits, and the profit of Islamic banks, this is seen from the results of the Granger Causality Test, where the F-statistical and Probability values are not equal to 0. Meanwhile, in the variance test, rupiah exchange rate decomposition affected the profit of Islamic banks by 1.65%, NPF affected net profit by 0.22%, and FDR affected the net profit of Islamic banks by 3.42%.

Keywords: *Rupiah Exchange Rate, Non-Performing Financing, Financing To Deposit, Profit, Sharia Banks*

Introduction

Islamic financial institutions, is an indicator that develops in the Islamic economic scope. This means that Islamic financial institutions are one of the indicators in seeing the development of the Islamic economy in Indonesia. This development is a clear proof that the concept of the Islamic economy itself can be accepted by the wider community, therefore, when people talk about the Islamic economy, they will talk about Islamic financial institutions that are currently growing. Islamic financial institutions that currently continue to be in the public spotlight are Islamic banks, where as is known, the development of Islamic banks continues to experience a significant increase, this can be seen from the large number of Islamic banks that appear in the midst of society. If you study the development of Islamic financial institutions or Islamic banking, then of course you will talk about the Islamic economic ecosystem (Sri Fitri Wahyuni, Muhammad Shareza Hafiz, 2016). Islamic financial institutions or Islamic banks are the foundation in the development of the existing sharia system system, because Islamic banking can help development in the components of the Islamic economy, such as halal food, halal tourism, halal fashion, and so on. Because, to develop these things and continue to maintain the existing halal system, of course, the components must also maintain the financing opinions obtained (Abdul Hadi Ismail, Khairunnisa, Riyan Pradesyah, 2023). This means that to maintain the existing sharia ecosystem, an indicator or sharia component must make transactions with the sharia system as well. For example, sharia hotels want to develop the companies they own, so of course in this development, sharia hotels must increase capital, so in this case sharia hotels must borrow in Islamic banks, this is done to maintain the existing sharia ecosystem.

Talking about Islamic banks, of course, will also talk about Islamic bank financing, where Islamic banks also carry out their operations based on regulations issued by the OJK and

Bank Indonesia. The operation of Islamic banks is inseparable from the name of collecting and distributing financing carried out by Islamic banks. In this case, Islamic banks must also carry out financing provided by the public, based on standard provisions, namely from the financial services authority and the national Sharia board (Khairunnisa, 2015). Likewise, with the collection carried out, Islamic commercial banks collect funds from the public with a sharia-compliant system, where in the collection there are contracts used, so each collection product has a contract that has been approved by the national sharia council. For example, raising funds with savings products, in this savings product, the bank provides two contracts according to needs, one is savings with a profit-sharing system, and one is a pure entrustment system. In the profit sharing system, of course, customers and banks will get profit sharing, in accordance with the agreed terms. Meanwhile, in the entrustment system, customers only entrust according to the agreement, and there is no system of addition or profit sharing in terms of entrustment. Contracts used in savings products, namely profit sharing and wadiah.

Literature Review

The theoretical foundations taken or presented in this study are sourced from journals, while those taken or described in the theoretical foundation start from the author's name, title, year of publication of the journal, the method used, and the results obtained. The theoretical foundations taken from several journals are as follows:

First, (Kirana et al., 2021) conducted a study entitled "The Influence of Macroeconomics and Microeconomics on Profitability in Sharia Rural Banks in Indonesia". They conducted research in 2021. The purpose of the study was to empirically test the effect of inflation, interest rates, KPMM, FDR, NPF, BOPO on profitability. With the *purposive sampling* technique, eight Sharia People's Financing Banks registered with the OJK in 2017-2020 were obtained as samples. Secondary data in the study was obtained from BPRS financial data in the public accounting firm publication report and other information as well as the profit and loss publication report that is already available at the Financial Services Authority and Bank Indonesia. The data analysis method uses multiple linear regression using SPSS Statistics 23.0. The results of the study through the t test showed that inflation, interest rates, KPMM, and NPF did not affect profitability, while FDR and BOPO had a significant effect on profitability in BPRS. The distribution of BPRS financing is the most important thing where the main task of a bank is to collect and distribute funds. Banks in managing financing must prioritize the principle of prudence so that bad debts do not occur.

Second, (Andyani & Mustanda, 2018) conducted a study entitled "The Effect of Micro and Macroeconomic Variables on Stock Returns". They conducted research in 2018. This study aims to explain the significant influence of CR, DER, ROE, TATTOOS, EPS, interest rates, inflation, and exchange rates on stock returns. This research was conducted on *food and beverage* sector companies on the Indonesia Stock Exchange (IDX) for the 2012-2016 period. The type of data used is quantitative data sourced from the official websites of the Indonesia Stock Exchange (IDX) and Bank Indonesia (BI). The number of samples was 12 companies that met the research criteria using the *purposive sampling* method. Data collection uses a *non-participant* observation method on documents in the form of the company's annual financial statements, interest rates, inflation and exchange rates during the 2012-2016 period. The data analysis technique used is multiple linear regression analysis. Based on the results of the analysis, it was found that CR, DER have a negative and insignificant influence on stock returns, ROE has a positive and significant influence on stock returns, TATO, EPS, interest rates

have a positive and insignificant influence on stock returns, inflation, exchange rates have a negative and significant influence on stock returns.

Third, (Misharni & Adziliani, 2019) conducted a study entitled "The Influence of Macroeconomics and Microeconomics on Capital Structure (Empirical Study on Djarum Group Companies for the Period 2008-2017)". They conducted research in 2019. The sample in this study is a company listed on the Indonesia Stock Exchange, namely the Djarum Group Company for the period 2008-2017. Data is collected using the annual financial statement documentation. The data collection tool is the observation of the company's annual report from the IDX Website. Hypothesis testing uses analysis, multiple linear regression, T test, F test and determination. The results showed that inflation had no effect on the *Long Term Debt to Equity Ratio (LTDtER)*, p value 0.670. The size of the company affects the *Long Term Debt to Equity Ratio (LTDtER)* p value of 0.000. Inflation and the size of the company simultaneously affect the *Long Term Debt to Equity Ratio (LTDtER)*, p value 0.000. In maintaining the company's survival, the company is expected to formulate the right strategy in marketing products when the inflation rate increases so as to reduce the impact caused by inflation. The company should continue to expand in various business sectors in order to increase company assets and business development in the future.

Fourth, (Wibowo & Saputra, 2017) conducted a study entitled "The Effect of Macro and Microeconomic Variables on Problematic Financing in Islamic Banks". They conducted the study in 2017. The purpose of this study is to determine how much influence the variables of inflation, *Gross Domestic Product (GDP)*, bank size (size), Financing to Deposit Ratio (FDR), Financing to Asset Ratio (FAR), and *Capital Adequacy Ratio (CAR)* have on the *Non Performing Financing* variable. (NPF) at Sharia Commercial Banks in Indonesia in 2011-2015. The subject of this study is Sharia Commercial Banks in Indonesia. In this study, a total sample of 11 Sharia Commercial Banks was obtained using *the purposive sampling* method. The analysis tool used is multiple regression analysis. Based on the results of the analysis, it was obtained that, GDP, size, and CAR had a significant effect on problematic financing. Meanwhile, inflation, FDR, and FAR have no effect on non-performing financing.

Fifth, (Widokartiko et al., 2016) conducted a study entitled "Impact of Internal Performance and Macroeconomic Conditions on Profitabilitas Pada Perbankan". They conducted a study in 2016. *This study used Granger causality and Vector Auto regressive (VAR)/Vector Error Correction Model (VECM) as data analysis tools. The results of this study confirm that Islamic banking has a more stable profitability in response to macroeconomic conditions compared to the conventional banking system. The response of profitability to the influence of macroeconomic variable movements can be concluded that in EXCHANGE RATES and INFLATION only Islamic banks can quickly stabilize. The influence of internal banking performance variables on macroeconomics is more common in conventional banks. The internal performance variable of CAR affects the BI-Rate, LDR affects the exchange rate.*

Sixth, (Adyatmika & Wiksuana, 2018) conducted a study entitled "The Effect Of Inflation And Leverage On Stock Profitability And Return On Manufacturing Companies On The Indonesia Stock Exchange". *They conducted research in 2018. This study uses the stocks of manufacturing sector companies as second object of research. The research sample was taken using the proportional random sampling method and the number of samples of this study was 31 companies obtained from the website of the Stock Exchange Indonesia from 2012 to 2016. Testing hypotheses is carried out using the path analysis method (Path Analysis) with the help of the SPSS program. The results of the study found that (1) Inflation ii has a negative and significant effect on Stock Returns, (2) Leverage has a negative and significant effect ii on*

Stock Returns, (3) Profitability has a positive and significant effect ii on Stock Returns, (4) Inflation has a negative effect and does not significant ii on Profitability, (5) Leverage negatively and significantly on Profitability, (6) Profitability is unable to mediate the effect of Inflation on Stock Returns, (7) Profitability n able mediating effect of *Leverage* on *Return Stock*.

Seventh, (Pradesyah, 2016) conducted a penelitian with the title "Analysis of the Effect of Rupiah Exchange Rate and Net Profit on the Performance of Bank Panin Syariah Stock Price". He conducted research in 2016. The research approach used is a *quantitative* research approach with VAR (*Vector Auto Regressive*) analysis, which is supported by stationarity tests, optimal lag tests, VAR model stability tests, granger causality tests, impulse response function tests and variance decomposition tests, assisted by Eviews software version 6. From the results of the study conducted at alpha 5%, the author concludes that the results of the VAR analysis, namely the *Varince Decomposition* test, show that the variables Rupiah Exchange Rate, and Net Profit affect the Performance of the Share Price of Panin Syariah Bank. In the short term or the period from the beginning of the observation to the end of the observation, Net profit has a more dominant influence of 13.87%. Meanwhile, the Rupiah Exchange Rate Variable has an influence on stock price performance of 0.23%. From the results of the granger causality test, it shows that all variables have a causality relationship with each other, meaning that each variable has a 2-way relationship with other variables. Meanwhile, the results of the *impulse response function* test show that the stock price performance responds positively and balancedly to the rupiah exchange rate. responds to the net profit variable with a negative and approaches the equilibrium point. So, when tested simultaneously, the most influencing variable is the net profit variable.

Eighth, (Pradesyah & Triandhini, 2021) conducted a study entitled "The Effect of Third-Party Funds (DPK), Non-Performing Financing (NPF) and Indonesian Sharia Bank Certificates (SBIS) on Sharia Banking Financing Distribution in Indonesia". They conducted research in 2021. The purpose of this study is to determine the effect of DPK, NPF, and SBIS both partially and simultaneously on the distribution of Islamic banking financing in Indonesia. In this study using quantitative methods and the type of data used is secondary data. The sample used in this study is data on total financing, deposits, NPF and placement of funds in SBIS of Sharia Commercial Banks contained in the monthly Statistics of Islamic Banking published by the Financial Services Authority for the period 2015 - 2019. The data analysis techniques used in this study were carried out classical assumption tests, multiple linear regression and hypothesis tests. The results of this study were processed in the SPSS 22 program. The results showed that partially (t test) the DPK variable had a positive effect on financing distribution. This is evidenced by t count $(56.185) > (1.67252)$ t table and sig values. $0.000 < 0.005$. The NPF variable had a negative effect with t count $(-3.914) < (1.67252)$ t table and sig. $0.000 < 0.005$. The SBIS variable had no effect, evidenced by t count $(1.536) < (1.67252)$ t table and sig values. $0.130 > 0.005$. Together (test F) shows that DPK, NPF, and SBIS have a significant effect on financing distribution as evidenced by calculated F values $(1565,122) > (2.77)$ F table and sig. $0.000 < 0.005$. The adjusted value of R² is 0.988 which means that the variables of DPK, NPF and SBIS affect the distribution of financing by 98.8% while the remaining 1.2% is influenced by variables outside this study.

Ninth, (Pradesyah & Ardianti, 2021) conducted a study entitled "The Influence of The Amount of Third Party Funds And Inflation on The Placement of SME Financing In The BMT Sharia Cooperative of The Civil Society of North Sumatra". They conducted research in 2021. This study aims to see the simultaneous effect of third-party funds and inflation on the allocation of financing for small and medium-sized enterprises. The research method used in this study is

quantitative, with data analysis using SPSS. As a result of the study, third party funds (DPK) partially have no effect and are not significant to SME financing, because the value of t calculates $< t$ table ($0.132 < 2.012$) and the significance level is greater than 0.05. Meanwhile, the inflation variable has an effect and is significant, on SME financing in terms of the calculated t value of the $< t$ table ($5,801 > 2,012$) and the significance level is smaller than 0.005. Meanwhile, simultaneously, Third Party Funds and Inflation affect SME Financing in BMT for North Sumatra Civil Society.

Tenth, (Sudarsono, 2018) conducted a study entitled "Analysis of the Influence of Micro and Macro Variables on NPF of Islamic Banking in Indonesia". They conducted research in 2018. This study aims to determine the influence of micro variables in the form of CAR, FDR, ROA and BOPO as well as macro variables in the form of Inflation, BI Rate and Exchange Rate on NPF in Islamic banking in Indonesia for the period 2011:1 to 2017:7. The data analysis method used is Auto-Regressive Distributed Lag (ARDL) which can analyze the relationship between independent variables to dependent variables in the long and short term. The results of data analysis show that in the short term the CAR variable has an insignificant negative effect on NPF, the variables FDR, ROA, BOPO and BI Rate have a significant positive effect on the NPF variable, while the Inflation and Exchange Rate variables have a significant negative effect on NPF. And in the short term, the variables CAR, FDR and BOPO have a significant positive effect on NPF, variable ROA and BI Rate Exchange Rate have a positive effect on NPF, while Inflation has a significant negative effect on NPF.

Method

This type of research is a type of associative research, with a causal relationship in which there are free and bound variables. It can be seen from the data obtained, this research is a type of quantitative research, because it refers to the calculation of research data in the form of numbers. This research is a study that looks for the relationship between one variable and another. The data analysis method used in this study is quantitative analysis using the VAR model. *Vector Autoregression* (VAR) is ADL model development. The VAR methodology was first put forward by Sims (1980). Where VAR allows the assumption of variables that are exogenous to estimate a series of variables that are suspected of endogeneity.

1. *Unrestricted VAR*, this model is related to the problem of cointegration and theoretical relationships. If the data used in VAR modeling data is stationary at a level, then the form is *Unrestricted VAR*. There are two forms of *unrestricted VAR*, namely *VAR in level* and *VAR in difference*. *VAR in level* is used if the data is stationary at the level *level* while *VAR in difference* is used if the data is not stationary at the *level* and has no cointegration relationship, then VAR estimation is carried out in the form of *data difference*.
2. *Restricted VAR* or called *Vector Error Correction Model (VECM)*, which is a form of restricted VAR, this occurs when the data is not stationary but cointegrated.
3. *Structural VAR is a form of VAR* that is restricted based on strong theoretical relationships and the ordering scheme of the relationship map to the changers used in the VAR model. Therefore S-VAR is known as the theoretical form of VAR.

The following is a model of equality that can be processed, namely one model for each variable to be studied:

$$LBS_t = \alpha + \beta_1 LBS_{t-1} + \beta_2 NTR_{t-2} + \beta_3 NPF_{t-3} + \beta_4 FDR_{t-4} + \varepsilon_t$$

$$NTR_t = \alpha + \beta_1 NTR_{t-1} + \beta_2 NPF_{t-2} + \beta_3 FDR_{t-3} + \beta_4 LBS_{t-4} + \varepsilon_t$$

$$NPF_t = \alpha + \beta_1 NPF_{t-1} + \beta_2 FDR_{t-2} + \beta_3 LBS_{t-3} + \beta_4 NTR_{t-4} + \varepsilon_t$$

$$FDR_t = \alpha + \beta_1 FDR_{t-1} + \beta_2 LBS_{t-2} + \beta_3 NTR_{t-3} + \beta_4 NPF_{t-4} + \varepsilon_t$$

The phased analysis performed in VAR/VECM is stationarity test, optimal lag determination, VAR model analysis, granger causality test, IRF test, and Variance Decomposition test.

Result and Discussion

Hasil Uji Stasioneritas

Variabel	Unit Root Test in	ADF Test Statistic	Critical Value 5%	Keterangan
X1	Level			Stasioneritas
	First Diference	-9.703594	-2.906210	
X2	Level			Stasioneritas
	First Diference	-8.202421	-2.906210	
X3	Level			Stasioneritas
	First Diference	-9.239633	-2.906210	
Y	Level			Stasioneritas
	First Diference	-8.902023	-2.906210	

Source: Data processed by researchers with E-Views, 2023

Based on the results of the stationarity test (ADF) that has been displayed by the researcher above, all variables in this study, namely X1, X2, X3 and Y, are stationarity at the *first dideference* level at a critical value of 5%.

Uji Lag Optimal

In determining this optimal lag, researchers used SC (Schwarz Information Criterion) as a guideline in lag testing. Where in this lag test, the researcher took the smallest value among the proposed lag values. The results of the optimal lag test that researchers conducted on the four variables are as follows.

Hasil Uji Lag Optimal

VAR-Lag Order Selection Criteria
 Endogenous variables: D(X1) D(X2) D(X3) D(Y)
 Exogenous variables: C
 Date: 01/18/23 Time: 18:55
 Sample: 1 68
 Included observations: 64

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-255.0866	NA*	0.038579*	8.096455*	8.231385*	8.149611*
1	-245.8389	17.05031	0.047703	8.307467	8.982118	8.573246
2	-230.6147	26.16675	0.049179	8.331708	9.546080	8.810110

Based on the optimal lag test using SC criteria, the researchers used the optimal lag to be 1. As stated in the table that the researchers have shown above, where the small criteria of the SC is 8.231385 which is located at lag 1.

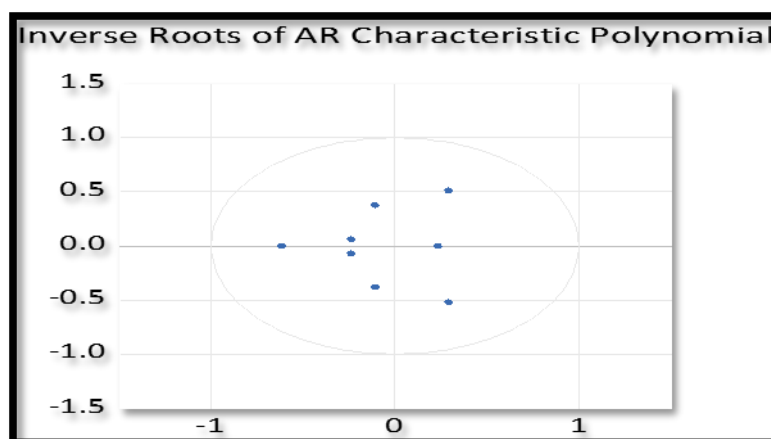
Uji Stabilitas Model VAR

In the VAR model stability test, the results of the root value must have a module smaller than 1, that way the test will be declared stable. However, if roots has modules greater than 1, then the VAR model is unstable. Here are the results of the VAR Model Stability Test.

Hasil Uji Lag Optimal

Root	Modulus
-0.619853	0.619853
0.291389 - 0.518624i	0.594877
0.291389 + 0.518624i	0.594877
-0.111723 - 0.374164i	0.390488
-0.111723 + 0.374164i	0.390488
-0.240970 - 0.063573i	0.249215
-0.240970 + 0.063573i	0.249215
0.233704	0.233704

Titik Invers Roots of Ar Characteristic polynomal



From the results of VAR stability testing that has been carried out by researchers, the researcher has obtained the results in the test, that the absence of unit roots is visible from figure 5 above, where the roots that have been produced have a modulus smaller than 1, and this is also supported from the inverse point image of Ar Characteristic polynomal which All variables are in a loop. So it is clear, from the results of submissions that have been made by researchers, it shows that the VAR model is stable.

Uji Kausalitas Granger

The gausality test intends to look at the direction of the relationship between the variables Rupiah Exchange Rate (X1), NPF, FDR, and Profit. If later the results obtained in the test are the F-statistical value and the probability is not equal to zero, it means that the variable has a relationship. The following shows the results of the granger causality test obtained by the researcher.

Hasil Pengujian Kausalitas Granger

Null Hypothesis:	Obs	F-Statistic	Prob.
X2 does not Granger Cause X1 X1 does not Granger Cause X2	67	4.32358 0.13878	0.0416 0.7107
X3 does not Granger Cause X1 X1 does not Granger Cause X3	67	2.39535 0.56520	0.1266 0.4549
Y does not Granger Cause X1 X1 does not Granger Cause Y	67	6.62420 0.43328	0.0124 0.5127
X3 does not Granger Cause X2 X2 does not Granger Cause X3	67	0.01692 6.34062	0.8969 0.0143
Y does not Granger Cause X2 X2 does not Granger Cause Y	67	0.76094 5.40914	0.3863 0.0232
Y does not Granger Cause X3 X3 does not Granger Cause Y	67	0.08948 10.2669	0.7658 0.0021

The guidelines taken to look at the table of the granger causality test are that if $\beta_{11} \neq 0$ and $\beta_{12} \neq 0$ (\neq value 0 and probability value $\neq 0$) then H_0 rejected means that there is a relationship between variables. Conversely if $\beta_{11} = 0$ and $\beta_{12} = 0$ (f-statistical value = 0 and probability value = 0) then H_0 is accepted meaning that there is no relationship between variables. Variable X1 is Rupiah Exchange Rate, X2 is NPF, X3 is FDR, and variable Y is Profit. From figure 6 of the causality test results above, it shows that:

- 1) H_0 : NPF no causality relationship with Rupiah Exchange Rate
 H_1 : NPF has a causality relationship with the Rupiah Exchange Rate.

Testing the granger causality for the first equation, it was seen that there was no occurrence of granger causality between NPF and Rupiah Exchange Rate. this is shown by the result F-statistical = 4.32358 and probability = 0.0416, then that H_0 is rejected, which means that NPF has a relationship with the Rupiah Exchange Rate.

1. H_0 : Rupiah exchange rate has no causality relationship with NPF
 H_1 : Rupiah exchange rate has a causality relationship with NPF

Testing the causality granger for the second equation, it was seen that there was no granger causality between the Rupiah exchange rate and the NPF. this is shown by the result F-statistical = 0.13878 and probability = 0.7107 then thus H_0 is rejected, which means that the Rupiah Exchange Rate has a relationship with NPF.

- 2) H_0 : FDR has no causality to the Rupiah Exchange Rate
 H_1 : FDR has a causality relationship with the Rupiah Exchange Rate

Testing the causality granger for the third equation, it was seen that there was no occurrence of granger causality between FDR and the Rupiah Exchange Rate. this is shown by the result F-statistical = 2.39535 and probability = 0.1266 then thus H_0 is rejected, which means that FDR has a relationship with the Rupiah Exchange Rate.

- 3) H_0 : Rupiah exchange rate has no causality relationship with FDR
 H_1 : Rupiah Exchange Rate has a causality relationship with FDR

Testing the causality granger for the fourth equation, it was seen that there was no granger causality between the Rupiah exchange rate and the FDR. this is shown by the result F-statistical = 0.56520 and probability = 0.4549 then thus H_0 is rejected, which means that the Rupiah Exchange Rate has a relationship with FDR.

4) H_0 : Profit has no causality relationship with rupiah exchange rate

H_1 : Profit has a causality relationship with the Rupiah Exchange Rate

Testing the granger causality for the fifth equation, it can be seen that there is no granger causality between Profit and Rupiah Exchange Rate. this is shown by the result F-statistical = 6.62420 and probability = 0.0124 then that H_0 is rejected, which means that Profit has a relationship with the Rupiah Exchange Rate.

5) H_0 : Rupiah Exchange Rate has no causality relationship with Profit

H_1 : Rupiah exchange rate has a causality relationship with profit

Testing the causality granger for the sixth equation, it can be seen that there is no occurrence of granger causality between the Rupiah exchange rate and profit. this is shown by the result F-statistical = 0.43328 and probability = 0.5127 then thus H_0 is rejected, which means that the Rupiah Exchange Rate has a relationship with Profit.

6) H_0 : FDR has no causality relationship with NPF

H_1 : FDR has a causality relationship with NPF.

Testing the causality granger for the seventh equation showed that there was no occurrence of granger causality between FDR and NPF. This is shown by the result F-statistic = 0.01692 and probability = 0.8969 then thus H_0 is rejected, which means that FDR has a relationship with NPF.

7) H_0 : NPF no causality to FDR

H_1 : NPF has a causality relationship with FDR.

The causality granger test for the eighth equation shows that there is no occurrence of granger causality between NPF and FDR. this is shown by the result F-statistical = 6.34062 and probability = 0.0143 then that H_0 is rejected, which means that NPF has a relationship with FDR.

8) H_0 : Profit has no causality relationship with NPF

H_1 : Profit has a causality relationship with NPF

Testing the granger causality for the ninth equation shows that there is no occurrence of granger causality between Profit and NPF. this is shown by the result F-statistical = 0.76094 and probability = 0.3863 then thus H_0 is rejected, which means that Laba has a relationship with NPF.

9) H_0 : NPF no causality to Profit

H_1 : NPF has a causality relationship with Profit

Testing the granger causality for the tenth equation showed that there was no occurrence of granger causality between FDR and ROA. this is shown by the result F-statistic = 5.40914 and probability = 0.0232 then that H_0 is rejected, which means that NPF has a relationship with Profit.

10) H_0 : Rupiah exchange rate has no causality relationship with FDR

H_1 : Rupiah Exchange Rate has a causality relationship with FDR

Testing the causality granger for the eleventh equation, it was seen that there was no occurrence of granger causality between the Rupiah exchange rate and the FDR. this is shown by the result F-statistical = 0.08948 and probability = 0.7658 then thus H_0 is rejected, which means that the Rupiah Exchange Rate has a relationship with FDR.

11) H_0 : FDR tidak ada hubungan kausalitas dengan Nilai Tukar Rupiah

H_1 : FDR memiliki hubungan kausalitas dengan Nilai Tukar Rupiah

Testing the causality granger for the twelfth equation shows that there is no occurrence of granger causality between FDR and the Rupiah Exchange Rate. this is shown by the result F-statistical = 10.2669 and probability = 0.0021 then that H_0 is rejected, which means that NPF has a relationship with ROA. It can be inferred from the existing causality test above, that each of the variables has a bidirectional relationship with the other variables.

Variance Decomposition Test

This test was used to see how much variance was before and after the shock of other variables and to see the relative effect of variables on other variables in one study. The following are the results of variance decomposition testing.

Variance Decomposition NPF, FDR, Profit to Rupiah Exchange Rate

Variance Decomposition of D(X1):					
Period	S.E.	D(X1)	D(X2)	D(X3)	D(Y)
1	0.375676	100.0000	0.000000	0.000000	0.000000
2	0.398107	94.12184	0.465817	0.479998	4.932341
3	0.404011	92.44286	0.978768	1.767698	4.810673
4	0.404418	92.37292	1.057479	1.768610	4.800988
5	0.404944	92.15043	1.059464	1.774886	5.015220
6	0.405056	92.11623	1.059868	1.781303	5.042598
7	0.405147	92.08123	1.093822	1.780705	5.044242
8	0.405180	92.06651	1.096598	1.780726	5.056166
9	0.405184	92.06473	1.096625	1.781112	5.057530
10	0.405188	92.06317	1.098078	1.781091	5.057659

Hasil test of *variance decomposition* that can be seen, that the variation in the Rupiah Exchange Rate is influenced by the Rupiah Exchange Rate itself in the first period of 100%. Meanwhile, in the second period, the variation in the predicted value of 9 was 4.12% and the rest was contributed by other variables, namely NPF 0.46%, FDR 0.47%, and Profit 4.93%. In the 10th period the biggest variance was profit with a value of 5.05% against the Rupiah exchange rate. Meanwhile, NPF has the smallest variance against the Rupiah Exchange Rate in the second period, which is 0.46%.

Variance Decomposition of Rupiah Exchange Rate, FDR, Profit, to NPF

Variance Decomposition of D(X2):					
Period	S.E.	D(X1)	D(X2)	D(X3)	D(Y)
1	0.715960	1.909736	98.09026	0.000000	0.000000
2	0.730452	1.915945	94.29352	1.599737	2.190798
3	0.737887	1.964868	92.94277	1.884642	3.207718
4	0.740730	2.106410	92.74235	1.879649	3.271592
5	0.742504	2.116269	92.46121	1.934143	3.488379
6	0.742862	2.116216	92.40516	1.952068	3.526560
7	0.742964	2.117443	92.40170	1.952024	3.528832
8	0.743053	2.118469	92.38740	1.955027	3.539101
9	0.743069	2.118380	92.38441	1.955665	3.541548
10	0.743074	2.118466	92.38428	1.955670	3.541587

The test results of *variance decomposition* can be seen, that the variation of NPF was influenced by the NPF itself in the first period of 98.09%. Meanwhile, in the second period, the

variation in the predicted value of 9 was 4.29% and the rest was contributed by other variables, namely the Rupiah Exchange Rate of 1.91%, FDR 1.59%, and Profit 2.19%. In the 10th period the biggest variance was Profit with a value of 3.54% against NPF. Meanwhile, FDR has the smallest variance against the Rupiah Exchange Rate in the second period, which is 1.59%.

Variance Decomposition of Rupiah Exchange Rate, NPF, Profit, to FDR

Variance Decomposition of D(X3):					
Period	S.E.	D(X1)	D(X2)	D(X3)	D(Y)
1	1.213883	0.798077	1.519899	97.68202	0.000000
2	1.238763	1.171630	1.860733	96.07472	0.892914
3	1.331174	1.014695	3.108313	83.60439	12.27260
4	1.342581	1.001690	3.286285	83.46504	12.24699
5	1.356736	1.216258	4.766132	81.78971	12.22790
6	1.362641	1.239484	4.754246	81.08701	12.91926
7	1.363216	1.245169	4.758867	81.05014	12.94582
8	1.364134	1.251671	4.854591	80.99626	12.99127
9	1.364497	1.258250	4.855086	80.90340	12.98326
10	1.36497	1.258250	4.855086	80.90340	12.98326

Hasyl test of *variance decomposition* can be seen that FDR variation was influenced by FDR itself in the first period of 97.68%. Meanwhile, in the second period, the variation in the predicted value of 9 was 4.29% and the rest was contributed by other variables, namely the Rupiah Exchange Rate of 1.17%, NPF of 1.86%, and Profit of 0.89%. In the 10th period the biggest variance was Profit with a value of 12.98% against FDR. Meanwhile, Profit has the smallest variance against FDR in the second period, which is 0.89%.

Variance Decomposition of Rupiah Exchange Rate, NPF, FDR, to Profit

Variance Decomposition of D(Y):					
Period	S.E.	D(X1)	D(X2)	D(X3)	D(Y)
1	0.533542	1.527141	0.145149	0.295335	98.03238
2	0.544794	1.652056	0.226614	3.429522	94.69181
3	0.596961	3.566247	12.27303	3.948194	80.21253
4	0.609439	3.596807	11.89182	3.823305	80.68806
5	0.610275	3.600884	11.89491	3.975654	80.52855
6	0.612071	3.626280	12.28495	3.980827	80.10795
7	0.612647	3.624742	12.26674	3.974797	80.13372
8	0.612693	3.625600	12.26656	3.981337	80.12650
9	0.612786	3.627470	12.28585	3.981296	80.10539
10	0.612816	3.627439	12.28511	3.980977	80.10648

The test results of *variance decomposition* can be seen, that the variation in Profit is influenced by the Profit itself in the first period of 98.03%. Meanwhile, in the second period, the variation in the predicted value of 9 was 4.69% and the rest was contributed by other variables, namely the Rupiah Exchange Rate of 1.65%, NPF of 0.22 %, and FDR of 3.42%. In the 10th period the largest variance was NPF with a value of 12.28% against Profit. Meanwhile, NPF has the smallest variance against Profit in the second period, which is 0.22%.

Conclusion

From the results of data analysis that have been put forward by researchers in the sebum chapters, it can be taken from the results of the analysis using the VAR method, namely the *Variance Decomposition* test at alpha 5%, and with the help of the *eviews 6* program, showing that the variables NTR, NPF, FDR have variants in influencing LBS variables. We can see this from the results of research that has been presented by researchers. At the beginning of the

researcher's observations, the variable Net profit or NTR had a more dominant influence than other variables, namely 1.52%, this continued to have an impact on the following periods until the end of the period, the Rupiah Exchange Rate remained the dominant and largest in influencing the net profit of Islamic banks.

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