



Policy of Sharia Bank Indonesia Based on Vector Autoregressive Model.

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Article Information Abstract

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There are two shocking conditions in Sharia Bank Indonesia during 2020-2021. The first is the impact of COVID-19, which responded by the implementation of National Economic Stimulus as Countercyclical Policy, and second is a merger of state-owned Sharia Commercial Banks into one Bank. The study aims to elaborate the Bank's performance post implementing those policies using Vector Autoregressive (VAR) model. The variables obtained have been treated as endogenous variables consisting of ROA, NPF, Operations Expenses/Operation Income - BOPO, FDR, NOM, ratio of Fixed Yield Portfolios to Floating Yield Portfolios, and the changing of policy with data period June 2014 to February 2021. The result shows that based on Impulse Response, Variance decomposition, and Granger Causality, the shock in policy will be responded to by Sharia Banking performance in a short time (not more than four months) except for variable Fixed Yield Portfolios to Floating Yield Portfolios. The variable Fixed Yield Portfolios to Floating Yield Portfolios has a relationship (Granger Causality) to NOM, Operational Cost/ Operational Income, ROA, and Policy

INTRODUCTION

Indonesia has the largest Muslim population globally, around 87.2% or 229 million, and it is around 13% of the world's population of Muslims. Contradictive with the majority Muslim population, the market share of Sharia Bank in Indonesia, around 6.55% (April 2021), increase from 5% in 2017. The fact is a penetration of Sharia Banking is very low. According to Financial Services Authority Indonesia, that index of Islamic financial literacy and inclusion that National Islamic financial literacy index was only 8.93 percent and National Islamic financial inclusion index was 9.1 percent. There are some quantum movement to increase market share Sharia Bank, such as regulation No. 21 /2008 that Conventional banks with sharia business units (UUS) to separate UUS from their parent by 2023, Conversion of Conventional Bank to Sharia Bank, implementation Islamic Financial Institution Qanun No 11 in 2018 is a special right for Aceh and the merger of 3 biggest state-owned Sharia Bank into one Bank, Bank Syariah Indonesia in January 27th 2021. According to SyariaPedia (2021), the conversion of some Conventional Banks to Sharia Bank, initiated by Bank Aceh (2016), BPD NTB (2018), some Conventional such as Bank Riau and Bank Nagari have been approved to convert by the General Meeting of Shareholders in 2019 and ongoing processed registration. At the beginning of 2021, most conventional Bank in Aceh Province has been converted to Sharia Bank as the implementation of Islamic Financial Institution Qanun No 11 in 2018 is a special right for Aceh (Qonun Aceh).

In 2019, COVID-19 created chaos in economic, social, and culture in the world. Impact on banking both in funding and financing. The condition has weakened debtor's performance and declining financing growth while customers have difficulties in excess money, which impacts funding. Furthermore, the pandemic impact on banking performance, financial and economic stability. To overcome such conditions as worse, Regulator has released some economic/social stimulus and regulations

for financial institutions. The policy is POJK No. 11/POJK.03/2020 with the period until March 31th 2021 and renew by POJK no.48 /POJK.03/2020 with the period until March 31th 2022. POJK carries out financing restructuring regarding asset quality assessment, such as lower interest rates, an extension of the period, reduction of principal arrears, reduction of interest arrears, the addition of credit or financing facilities, or conversion of credit or financing to Temporary Equity Participation. The choice of option and the criteria of debtors are solely depending on Bank's analysis.

Some theories regarding bank performance are commonly used in research; basically, the performance measurement consists of financial ratios and non-financial ratios. Based on the perspective, there are a conventional (non-Islamic) perspective and an Islamic perspective.

According to Hajer & Anis (2018), there are two basic types of measurement of bank performance. The first type is related to the results. The second one, financial measure focuses on the determinants of the results (non-financial measures) such as quality, flexibility, resources, and innovation. This stipulates that measurement can be established around the concepts of outcomes and determinants as part of the performance. In the economic and financial literature, refer to Nouaili et al., (2015), two key indicators were advanced to measure banking performance. It is about the profitability of the assets (ROA and ROE) and the net margin interest (NIM). Kasman & Carvallo (2013), the efficiency, measured by ratios (ratio of costs on outcome or ratio of overheads on assets) or estimated by parametric methods and non-parametric, improves the performance of banks. Liu et al. (2010), with case study Japan Bank, analyzing the behavior of banks having a weak market share, showed a negative relationship between market share and performance (measured by net margin interest). Those banks seek to grow and gain market shares by granting credits to risky people and matching higher interests, which will increase their NIM and

performance. According to Chouikh & Blagui (2017), with case study Tunisia Bank, there are two types of determinants of bank performance; internal and external. The internal explanatory variables are the bank size, privatization, board size, capital-to-assets ratio, and efficiency cost. The macro-economic (external) exogenous variables are gross domestic product growth rate and inflation. The result suggests a statistically significant and negative relationship between bank profitability (endogenous variable) and board size, while the remaining variables were statistically insignificant.

The basic understanding about Islamic perspective is the performance not only in financial variables but included what's the contribution of Sharia Bank to the world which will be asked in the hereafter (Rahmatan lil Alamin). Sharia banking is part of the Islamic economic system to achieve fair distribution among wealthy and poor, transparent and equal transactions. In his research, Hameed et al. (2004) inform that Islamicity disclosure index comprises three indicators: Shariah compliance indicator, corporate governance indicator, and social/environment indicator with case study in Malaysia Bank. Setiawan et al. (2020) come out with the research to uses a meta-analysis approach with results besides financial ratio; Sharia Bank can use performance models include the Islamicity Index, Economic Contribution and Muslim Communities, Social Performance Index, Maqashid Index, and Islamic Bank Maqashid Index.

Financial banking performance in Indonesia refer to POJK No. 32 / POJK.03 / 2016 concerning Transparency and Publication of Bank Reports, consist of ROA, CAR, NOM, Operational Cost and Operational Income (BOPO), FDR, Short term Mismatch Ratio; while in Statistik Perbankan Syariah released monthly by Financial Services Authority, there are some more variables such as Earning Asset Quality, Yield Proportion, Fixed Yield Portfolios to Floating Yield Portfolios, Investment Proportion and Risk, Potential Loss from Profit Sharing Financing to Total Mudharabah and Musyarakah.

The government has released many regulations to protect the multidimensional sector from minimizing the effect of the pandemic, and to recovery, the social, health, and economic failure worsen. In this literature review, the author will focus on regulation related to the financial sector, especially the banking industry.

First, President Joko Widodo has issued Presidential Regulation No. 103/2020 on Central Government guarantee on developing development programs in boosting the national economy and/or the National Economic Recovery program. The regulation effectively provides financial institutions with a guarantee of liquidity for financing programs related to national development and/or the government's National Economic Recovery program.

Second, The Ministry of Finance has issued Minister of Finance Regulation No. 85/PMK.05/2020 on guidelines for granting interest subsidies / credit margin subsidies / financing for micro, small, and medium enterprises (MSMEs) in implementing the National Economic Recovery Program. This regulation revokes Minister of Finance Regulation No. 675/PMK.05/2020 on subsidies for micro, small and medium enterprises and introduces simpler guidelines for granting subsidies from MSMEs, such as by erasing various definitions concerning bank accounts and introducing the Finance and Development Supervisory Agency (BPKB) as the programs' internal supervising body.

Third, Bank Indonesia has issued BI Regulation No. 22/10/PBI/2020 and BI Board of Governors Council Regulation No. 22/19/PAD/2020 on Statutory Reserves Requirements (GWM) Rupiah and Foreign currencies. The regulations allow banks to fulfill a daily and average GWM of 1.5% per year to receive the central Bank's checking services with a limit of 3% of the Bank's third-party funds. This regulation was issued to maintain economic and financial system stability amidst the COVID-19 pandemic.

Following the issuance of emergency legislation that gives the state special powers to contain the economic fallout of COVID-19 ("Perppu 1/2020"), OJK has released regulation number 18/POJK.03/2020 ("POJK 18/2020") to

provide a solid legal basis to require compulsory consolidation in the banking sector. The new regulation allows the OJK to issue a written directive ("Directive") to a distressed bank, on the one hand, and a sound bank, on the other, requiring them to jointly engage in a restructuring process by way of merger, consolidation, acquisition, integration and/or conversion. Thus, two parties are involved in the process: a distressed bank and a sound bank (collectively the "Participating Parties").

Some researchers have done some studies regarding Sharia Banking performance in Indonesia that include periods of Covid 19 and merger of Sharia Bank. Refers to Yusuf & Ichsan (2021); whom performed study about Sharia banking performance after the merger of Sharia Banks and Covid 19 pandemic by looking at the influence of NPF, FDR, BOPO, and CAR financial performance of Sharia Commercial Banks in period 2011-2020, using regression test with the result is Simultaneously, the variables of NPF, FDR, BOPO and CAR have a significant impact on the financial performance (ROA) of sharia commercial banks in Indonesia. Fakhri & Darmawan (2021) analysis using Artificial Neural Network (ANN) that the COVID-19 pandemic affected financial performance factors in the form of a Funding to Deposit Ratio of 35.21%; Short Term Mismatch of 26.92% and Net Operation Margin of 26.92% in Islamic banking. Whereas in conventional banking, Operating Expenses to Operating Income was 72.87%, and the Capital Adequacy Ratio was 17.31%. Nugroho et al., (2020) a stress test on the impact of macroeconomic changes in pandemic on key financial indicators (ROA & NPF) of the three largest Islamic banks in Indonesia. The results are the mild scenario, and moderate scenario of the Islamic banking industry can be endured. However, in the worst-case scenario, NPF of the Islamic banking industry has a significant increase. Ganar et al., (2020) using Least Square Regression Method in Eviews 9 had tested the impact of corona virus pandemic event on the Islamic stock index in Indonesia with the result there was a significant impact on Indonesian Sharia Stock Index (ISSI) and the Jakarta Islamic Index (JII).

Some studies using VAR/ VECM model in banking industry has been carried out by Bahril et al., (2020) using Vector Error Correction Model (VECM) to find the short and long term impacts and response to the shock impact in CAR, FDR, BOPO, Third party's funding (DPK) to financing Indonesia Islamic Rural Bank, the result that CAR, FDR, BOPO and DPK (third party's fund) have a significant positive effect on financing in short term. in the long term, CAR, and NPF have a significant positive effect. Kattai (2010) with the case study of Estonian Bank using VAR model for Credit Risk Banking, come out with credit risk model draws a link between underlying economic conditions and the health of the banks' credit portfolios.

Those studies have explained the effect of pandemic and the merger of Bank performance. However, they have not explained the impact of the policy taken by the Financial Services Authority on banking performance and the recommendation as to the feedback to the Regulator. One of the objectives in this study is to fill the gap of evaluation of policy based on banking performance using a statistical method and set up a recommendation of strategic policy to improve banking performance, especially in Sharia Banking.

The objectives of this study as follows; first is using statistical method using Vector Autoregressive (VAR)/ Vector Error Correction Model (VECM) to forecast the model for Sharia Banking Performance with internal variables of Bank (ROA, NPF, NOM, Operational Cost/Operational Income, Fixed yield portfolio to floating yield portfolio), second is analyzing the relationship among internal variables and the changing policy, especially during COVID-19, third is give feedback recommendation of policy as the strategies policy for Sharia Banking to increase Banking Performance.

RESEARCH METHODS

In order to analyze the data to find out the best strategy policy to increase bank performance in terms of financial performance indicators in Indonesia Sharia Bank, in this study, the analytical process is based on statistical model VAR method in EVIEWS 9.

Type of data in this methodology using secondary data of banking performance and documentation of policy released by Financial Services Authority of Indonesia (OJK). Data of banking performance retrieved from OJK web site - Statistik Perbankan Sharia (SPS) Report position February 2021 consists of data from June 2014 up to February 2021. The Report was used in section of Financial Performance of Sharia Commercial Banks which consist of % Return of Asset - ROA, % Non Performing Financing - NPF, % Operations Expenses/ Operation Income - BOPO, % Financing to Deposit - FDR, % Net Operation Income - NOM, % Fixed Yield Portfolios to Floating Yield Portfolios - Fix-Flo. The trend of the secondary data was shown in figure 1.

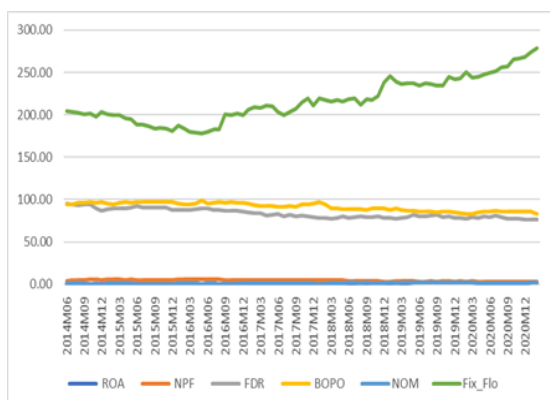


Figure 1. Trend of financial performance's key indicator variables of Sharia Commercial Banks
Source: OJK February 2021 (Processed).

There is another data used in this study; there are two shocking policy to bank performance. First is the policy regarding Covid 19 to Bank regulated in Financial Services Authority Regulation Number 11/POJK.03/2020 concerning National Economic Stimulus as Countercyclical Policy on the Impact of Coronavirus Disease 2019 Spread and Regulation of Financial Services Authority Number 65/POJK.03/2016 concerning the Implementation of Risk Management for Sharia Commercial Banks and Sharia Business Units. Second is the policy of merger state-owned Sharia Commercial Banks into one Bank (BNI Sharia, BRI Sharia and Bank Sharia Mandiri become one bank namely PT Bank Sharia

Indonesia Tbk) vide regulation published by OJK on SR-3/PB.1/2021 perihal Pemberian Izin Penggabungan PT Bank Sharia Mandiri dan PT Bank BNI Sharia ke dalam PT Bank BRI Sharia Tbk at January 27th 2021. As per Information of Bank Sharia Indonesia (2021), The result of the merger accumulated 214 trillion IDR in assets become the largest Sharia bank and seventh largest Bank in Indonesia whose total branches are 1200.

Banking Performance analysis in this study uses Vector Autoregression (VAR) because after running the model it is suitable to use VAR (the data have no cointegration) and not suitable to use Vector Error Correction Model (VECM). The procedure uses frameworks as explained by Rifin (2021). Before determining the use of VAR / VECM in the model, the data must first find out whether there is a cointegration relationship or not by using the Trace statistic test or the Eigenvalue test. If the analyzed model has no relationship cointegration, the analysis model used in banking performance is VAR, and vice versa if there is a cointegration relationship, the analysis model used is VECM.

The first step taken in banking performance with VAR / VECM is the stationarity test. The stationarity test is essential to do because it is to avoid spurious regression. The data is said to be stationary if the average and variance values are constant over time. Data stationarity was tested using the Augmented Dickey-Fuller Test (ADF). The next step is to see the cointegration relationship that occurs between variables based on two test statistics, namely, Trace statistic ($\lambda_{trace}(\tau)$) and maximum Eigenvalue test (λ_{max}). If there is cointegration, then the suitable model is VECM but if there is no cointegration, the model should be VAR.

The stages or steps for carrying out an analysis using VAR / VECM are shown in figure 2 as follows; (a) Stationery Test using unit root test, (b) VAR stability test, (c) Optimum lag test, (d) Cointegration testing, (e) VAR / VECM estimation, (f) Impulse Response, and (g) Variance Decomposition.

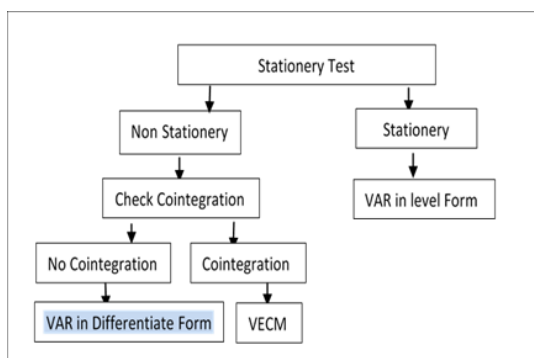


Figure 2. Model Development How to Choose VAR/ VECM.

Source: Riffin & Feryanto (2021).

Explanation in detail of model development as figure 2 to find out the best model VAR-VECM as follows; First step is running the Stationery test. The definition of stationary Data is Data that does not contain elements trend, stationary data shows a fixed variance of data throughout the observation time, while the data are not stationary describes that at a given moment, the situation economy performs a particular act of getting out of usual data that is not stationary if regression will result in spurious regression or false regression because the independent variable may affect the variable dependent because both have a trend not because the variables are influential (Riffin, 2021).

There are two methods to check the stationery of data, first by Auto Correlation Function (ACF), and second by Unit root test. In the unit root test in EVIEWS 9 version, there are also several methods, namely Phillips-Perron (PP), Dickey-Fuller GLS (ERS), Kwiatkowski-Phillips-Schmidt-Shin, Ng Peron and Augmented Dickey-Fuller (ADF). The concept of Augmented Dickey-Fuller was used to test whether the variables were stationary or not. The test is performed by “augmenting” the preceding three equations by adding the lagged values of the dependent variable ΔY_t (Gujarati, 2003).

In the study, we choose the Unit Root test using Augmented Dickey-Fuller because it is easy to understand and familiar with using the ergonomic.

The second step is VAR stability condition check. The VAR stability test is done by calculating the roots of the polynomial function or known as the roots of the characteristic polynomial. If all the roots of the polynomial function are in the unit circle or if the absolute value is less than 1 then the VAR model is considered stable

The third step is Lag determination process. Lag determination in a VAR model is essential. It is helpful for showing how long a variable reacts to other variables, and determining the optimal lag is also helpful for eliminating autocorrelation problems in a VAR model. In time-series data, it is possible to have a long-term relationship between the existing variables. The phenomena can be seen from two or more variables moving the same in the long run to require a cointegration test. This cointegration test aims to detect the stability of the long-term relationship between the independent and dependent variables. Method of determination: Engle Granger Test or Johansen Cointegration Test. In this study, we use Johansen Cointegration Test.

The fourth step is VAR / VECM estimation. Based on the Cointegration test above, if the Data doesn't have cointegration, then the VAR model is the best to implement, but if the cointegration exists, then the model should be VECM. In the study, the Data doesn't have cointegration then the model was chosen is VAR.

The seventh step is Impulse Response analysis. The impulse response function helps overcome the complexity of interpreting VAR / VECM results. IRF is helpful for showing how a variable responds to a shock in the variable itself and other endogenous variables. So that the VAR model can also be said to see the impact of changes from one variable to another in the system. The shock that is given is usually in a measure of the standard deviation of the variable.

The Last step is variance decomposition analysis, Variance decomposition is useful for explaining each variable's contribution to the shock it causes to the main observed endogenous variables that have been explained in the Impulse response.

RESULTS AND DISCUSSION

The results of a method using EVIEW 9 – VAR / VECM Model according to the step of model was initiated by the result of Stationery

Test/ Unit Root. The result was shown in Table 1 and 2 above, indicates that the data become stationary in the first difference, which is probability below 0.05 and ADF t-statistics less than MacKinnon Critical Values for all of the variable observation.

Table 1. Result of ADF Test in Level

Variables	ADF t-statistik	Prob	MacKinnon Critical Values			Remark
			1%	5%	10%	
BOPO	-0.57	0.87	-3.51	-2.90	-2.59	No Stationery
FDR	-1.68	0.44	-3.52	-2.90	-2.59	No Stationery
FIX_FLO	0.93	1.00	-3.51	-2.90	-2.59	No Stationery
NOM	-1.34	0.61	-3.51	-2.90	-2.59	No Stationery
NPF	-0.95	0.77	-3.52	-2.90	-2.59	No Stationery
Policy	-0.63	0.86	-3.51	-2.90	-2.59	No Stationery
ROA	-1.08	0.72	-3.51	-2.90	-2.59	No Stationery

Source: Data Processed, 2021

Table 2. Result of ADF

Variables	ADF t-statistic	Prob	MacKinnon Critical Values			Remark
			1%	5%	10%	
BOPO	-9.31	0.00	-3.52	-2.90	-2.59	Stationery
FDR	-10.58	0.00	-3.52	-2.90	-2.59	Stationery
FIX_FLO	-9.13	0.00	-3.52	-2.90	-2.59	Stationery
NOM	-10.62	0.00	-3.52	-2.90	-2.59	Stationery
NPF	-4.95	0.00	-3.52	-2.90	-2.59	Stationery
Policy	-8.89	0.00	-3.52	-2.90	-2.59	Stationery
ROA	-10.17	0.00	-3.52	-2.90	-2.59	Stationery

Source: Data Processed, 2020

The result of VAR Stability Test was shown in figure 3. it is shown that there is no root lies outside the unit circle, which means VAR stability has been achieved.

Figure 3. Result of VAR Stability

Root	Modulus
0.995321	0.995321
0.904272	0.904272
0.829859 - 0.268805i	0.872308
0.829859 + 0.268805i	0.872308
0.799423	0.799423
0.669017	0.669017
0.379609 - 0.237032i	0.447534
0.379609 + 0.237032i	0.447534

Root	Modulus
-0.252553 - 0.334929i	0.419477
-0.252553 + 0.334929i	0.419477
-0.303878 - 0.237819i	0.385875
-0.303878 + 0.237819i	0.385875
-0.218283	0.218283
-0.02909	0.02909

Source: Data Processed, 2020

The result of Optimum lag test was shown in Figure 4. It is shown that the method gives recommendation the best lag is number one, which shown by the total number of stars in number one (3 stars) is the more extensive compare which other lag numbers such as number seven and number eight (1 star).

Figure 4. Result of Lag Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0.00	-509.12	NA	0.00	14.14	14.36	14.23
1.00	-140.49	656.46	5. e-07*	5.38	7.14*	6.08*
2.00	-103.87	58.20	0.00	5.72	9.02	7.04
3.00	-70.58	46.51	0.00	6.15	10.98	8.08
4.00	-14.87	67.16	0.00	5.97	12.34	8.51
5.00	20.90	36.26	0.00	6.33	14.24	9.48
6.00	54.58	27.68	0.00	6.75	16.20	10.52
7.00	168.38	71.71*	0.00	4.98	15.96	9.35
8.00	274.27	46.42	0.00	3.41*	15.94	8.41

Source: Data Processed, 2019

Cointegration test at level 0.05, which was shown in Figure 5 and figure 6. Indicate that there is no cointegration in the model. It means in a long-term relationship between the existing variables, there will no moving the same in the long run, therefore the suitable model is VAR, not VECM

Figure 5. Result of Trace

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None	0.39	104.83	111.78	0.13
At most 1	0.23	66.51	83.94	0.46
At most 2	0.19	45.90	60.06	0.43
At most 3	0.16	29.27	40.17	0.39
At most 4	0.11	15.23	24.28	0.44
At most 5	0.07	6.52	12.32	0.38
At most 6	0.01	1.09	4.13	0.35

Source: Data Processed, 2020

Figure 6. Result of Maximum Eigenvalue

Hypothesized No. of CE(s)	Eigenvalue	Max-Eigen Statistic	0.05 Critical Value	Prob.**
None	0.39	38.32	42.77	0.14
At most 1	0.23	20.61	36.63	0.86
At most 2	0.19	16.64	30.44	0.80
At most 3	0.16	14.04	24.16	0.60
At most 4	0.11	8.70	17.80	0.63
At most 5	0.07	5.44	11.22	0.42
At most 6	0.01	1.09	4.13	0.35

Source: Data Processed, 2020

Since there are seven variables in data observation, then VAR model will come out with seven equations as shown in figure 6. The R-squared in the model has minimum 87. 5% for % Net Operation Margin (NOM), and the highest is 97.3% for Fixed Yield Portfolios to Floating Yield Portfolios (FIX_FLO). In the analysis section the model will use as forecast, the result forecast data will be compared with the actual data.

Figure 7. VAR Model

Level	POLICY	ROA	NOM	FIX_FLO	FDR	NPF
POLICY(-1)	0.84	0.01	-0.01	0.91	2.06	0.13
POLICY(-2)	0.05	0.21	0.22	-0.11	-1.56	-0.13
ROA(-1)	0.09	0.96	0.60	-5.44	-1.56	0.85
ROA(-2)	0.06	-0.85	-1.17	-5.32	0.14	-0.98
NOM(-1)	0.03	-0.35	0.14	1.30	1.95	-0.17
NOM(-2)	0.08	1.03	1.30	-6.76	0.02	0.34
FIX_FLO(-1)	0.00	0.00	0.00	0.73	0.01	-0.01
FIX_FLO(-2)	0.01	0.00	0.01	0.09	-0.02	0.00
FDR(-1)	0.00	-0.02	-0.02	-0.72	0.71	-0.03
FDR(-2)	0.00	0.00	0.00	0.32	0.21	0.04
NPF(-1)	-0.05	-0.07	-0.11	-2.01	0.66	0.57
NPF(-2)	-0.01	0.00	0.02	-1.49	-0.01	0.13
BOPO(-1)	0.04	0.01	0.03	0.07	0.16	0.12
BOPO(-2)	0.00	0.04	0.04	-1.58	-0.21	-0.10
C	-4.13	-3.34	-4.92	244.30	9.26	-1.07
R-squared	0.96	0.90	0.88	0.97	0.94	0.91
Adj. R-squared	0.95	0.87	0.85	0.97	0.93	0.89
Sum sq. resid	0.73	1.70	2.33	1398.57	113.60	5.35
S.E. equation	0.11	0.16	0.19	4.67	1.33	0.29
F-statistic	99.99	39.97	32.10	167.95	77.79	47.50
Log likelihood	72.90	39.52	27.14	-225.61	-126.44	-5.75
Akaike AIC	-1.47	-0.62	-0.31	6.09	3.58	0.53
Schwarz SC	-1.02	-0.17	0.14	6.54	4.03	0.98
Mean dependent	0.30	1.07	1.16	216.89	83.09	4.40
S.D. dependent	0.46	0.46	0.49	26.01	5.12	0.88

Source: Data Processed, 2020

The Granger causality test is used to determine whether there is a reciprocal relationship between the two variables. Withdrawing conclusions from the causality test, the probability value is used. If the probability value is less than 5% then H0 is rejected. In other words, it can be concluded that there is a relationship.

Table 3. Summary Result of Granger Causality Test (Variables whose have Prob < 5%)

Null Hypothesis:	F-Stats	Prob.
FDR does not Granger Cause BOPO	4.918	0.010
FIX_FLO does not Granger Cause BOPO	4.648	0.013
BOPO does not Granger Cause NPF	4.091	0.021
BOPO does not Granger Cause POLICY	3.363	0.040

Null Hypothesis	F-Stats	Prob
FDR does not Granger Cause NOM	4.755	0.011
FDR does not Granger Cause NPF	3.596	0.032
FDR does not Granger Cause ROA	4.743	0.012
FIX_FLO does not Granger Cause NOM	4.509	0.014
FIX_FLO does not Granger Cause POLICY	7.353	0.001
FIX_FLO does not Granger Cause ROA	5.366	0.007
NPF does not Granger Cause NOM	3.247	0.045
NOM does not Granger Cause POLICY	3.314	0.042
NPF does not Granger Cause POLICY	4.585	0.013
NPF does not Granger Cause ROA	3.716	0.029
ROA does not Granger Cause POLICY	3.141	0.049

Table 3. shows the rank of variable which cause other variables as follow FDR and Fixed Yield Portfolios to Floating Yield Portfolios (impacted to 4 variables), NPF (impacted to 3 variables), NOM and ROA (impacted to 3 variables). It is important to notice that policy in the period of data (Jun 2014 – Feb 2021) does not impact or does not granger cause to other variables. The result will be different if the period of data focuses on the implementation of policy regarding Covid-19. Based on Fakhri & Darmawan (2021) research with the period data January 2020 to September 2020 using Artificial Neural Network (ANN) model, it showed % impacted of condition to banking performance as follow FDR impacted 35.21%, Short Term Mismatch 26.92%, NOM 26.92%, BOPO 7.32% and CAR 2.72%.

The complex relationship among banking performance variables could be an external and internal factor. In this study, we focus in the internal factor in Bank which is impacted by policy, however, the relationship among variables could not be an assumption that there is a dependent and independent correlation. Therefore, using the VAR model as the statistical method that treats all variables as endogenous data is powerful. Table 4. Shows the comparison between actual data & forecasting of VAR Model from 2020 to February 2021 with the accuracy (R-squared minimum 87.5% for NOM to 97.3% for Fixed Yield Portfolios to Floating Yield Portfolios. The impact of Merger 3 most significant state own Sharia Bank in January 27th 2021 shown in the increase of ROA in January 2021 was 1.79 become 2.15

Table 4. The Comparison between Actual Data & Forecasting of VAR Model

Periode	ROA		NPF		FDR		BOPO		NOM		Fix_Flo	
	Act	ForC	Act	ForC	Act	ForC	Arc	ForC	Arc	ForC	Arc	ForC
2020M01	1.88	1.57	3.46	3.47	77.90	79.13	83.62	85.82	1.85	1.66	242.78	245.57
2020M02	1.85	1.59	3.38	3.45	77.02	79.05	82.78	85.66	1.78	1.67	250.07	246.51
2020M03	1.86	1.60	3.43	3.42	78.93	78.97	83.04	85.49	1.72	1.69	244.00	247.46
2020M04	1.55	1.62	3.41	3.39	78.69	78.89	84.60	85.33	1.49	1.70	244.45	248.39
2020M05	1.44	1.63	3.35	3.36	80.50	78.81	85.72	85.16	1.34	1.71	247.30	249.33
2020M06	1.40	1.65	3.34	3.33	79.37	78.73	86.11	85.00	1.34	1.73	249.25	250.26
2020M07	1.38	1.66	3.31	3.30	81.03	78.65	86.25	84.84	1.34	1.74	251.83	251.19
2020M08	1.36	1.67	3.30	3.28	79.56	78.57	86.22	84.68	1.36	1.75	256.33	252.11
2020M09	1.36	1.70	3.28	3.25	77.06	78.49	86.12	84.52	1.37	1.77	257.48	253.03
2020M10	1.35	1.72	3.18	3.22	77.05	78.41	86.08	84.36	1.38	1.78	265.46	253.94
2020M11	1.35	1.73	3.22	3.19	77.61	78.33	86.10	84.20	1.39	1.79	266.32	254.85
2020M12	1.40	1.75	3.13	3.17	76.36	78.25	85.55	84.04	1.46	1.81	268.03	255.76
2021M01	1.79	1.75	3.20	3.14	76.59	78.18	85.44	83.88	1.93	1.82	273.99	256.66
2021M02	2.15	1.76	3.18	3.11	76.51	78.10	82.98	83.73	2.31	1.83	278.48	257.55

Note: Measurement in %, Act = actual data, ForC= Forecast data

Source: Data Processed, 2019

To analyze how a variable responds to a shock in the variable itself and other endogenous variables were shown in Figure 7., with the explanation with the critical point related to the strategic policy as follow; other variables will respond to the shock in policy since the first month, and the response becomes weaker in the fourth month, then in the run time, the shock will not be responded (does not give any impact to

other variables). The phenomena will not happen in Fixed Yield Portfolios to Floating Yield Portfolios, in Figure 1. Shown the trend of Fixed Yield Portfolios to Floating Yield Portfolios from September 2016 become higher in the run time (200.5% to 278.5%). The shock in policy in restructuring financing will not impact Fixed Yield Portfolios to Floating Yield Portfolios. However, the conditions will become dangerous

if the interest rate will be higher since 46.7% financing contract in Murabaha (fixed yield) as of February 2021. Referring to Indonesian Economic and Financial Statistics (SEKI), the interest rate as the benchmark shown the trend decline in Figure 8; this condition will be a benefit for Bank since Murabaha contract is fixed yield during financing tenor, but it could be not good for customer hence customer will think it the pricing in Sharia Bank is higher and not flexible such as in Conventional Bank.

One solution for the inflexibility of fixed rate of sale contract was implemented in Malaysia with the concept of Ibra/ rebate since 2013. Ibra/ rebate is The Bank may grant Ibra,' or rebate on a monthly basis for the following on the profit portion of selling price provided the effective profit rate is lower than ceiling rate, upon early settlement/redemption of the facility, upon maturity of the facility (Abdul & Mohamad, 2016). The regulation regarding Ibra/ rebate has not implement in Indonesia. According to Maulidizen (2018), 70-80% financing consumptive and productive using Murabaha contract, "need to find solutions how to calculate the price and mark up allowed so that customers do not burden at a cost much more expensive than the interest applied in conventional banks".

Based on Survey conducted by the Rumah.com Consumer Sentiment Study, there are positive trend for Sharia mortgage in H2 2020 survey, the increase in consumer preference for choosing Sharia KPR to 35% of respondents at the beginning of the second semester of 2020 from 29% of respondents in the first semester of 2020. On the other hand, mortgage enthusiasts Conventional has decreased from 37% compared to the first semester of 2020. The positive trend should be the good moment for Sharia Bank to increase Murabaha since majority contract in Consumer financing is Mortgage and the majority contract is Murabaha. As per February 2021, portfolio share of consumer financing is 48% total financing Bank Sharia.

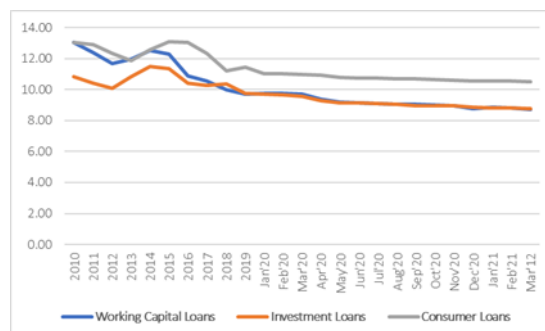


Figure 8. The Trend of Interest Rate on State Banks. Source: Indonesian Economic and Financial Statistics (SEKI), May 2021

The shock in policy regarding restructuring financing which implementation depends on Bank's assessment, has responded by NPF in the first month than become almost zero (not responded anymore), the condition of restructuring as the bridging for watch list financing to become current financing and not become NPF, however, the condition of restructuring is just allowed in one year. If the economic conditions become worse, then there will be a possibility that the restructuring financing will become NPF after one year. It is importance for the Bank to maintained and do discipline collection regardless the policy of restructuring policy to mitigate the higher number of NPF in the middle year 2021 up to the middle of 2023 (since the period of policy has been renew to March 2022)

The shock in NPF has been responded to fast by all variables, and the trend of the variable's response becomes stable after six months. The response of BOPO (operational cost / operating income) to shock in NPF in the graph is a positive trend (0.5 standard deviations) higher than the negative trend in ROA and NOM (0.2 – 0.3 standard deviation).

Based on variance decomposition, some critical points are the profitability of Bank which shown by ROA that the majority variables contribution to the value of ROA in the tenth month is Fixed Yield Portfolios to Floating Yield Portfolios (21.3%), FDR (11.9%), NOM (11.6%) and NPF (11.2%). The majority variable contributions to the value of NOM are ROA

(36.55), Fixed Yield Portfolios to Floating Yield Portfolios (19.7%).

Variance decomposition and Granger causality show that the importance of Bank has sustainability of yield in fixed yield portfolio to floating yield portfolio. Sustainability will be related with the innovations and win-win solution for customer, especially for long term. Hence, Sharia Bank must consider high price in Fixed Yield contract compared to Conventional Banks, especially when the interest rate tends to decrease.

The majority variable contributions to the value of Fixed Yield Portfolios to Floating Yield Portfolios are FDR (15.3%) and Operational Cost/Operational Income (15.67%). The majority variable contributions to NPF value are FDR (13.5%) and Fixed Yield Portfolios to Floating Yield Portfolios (13.9%). Higher operational cost related to high cost in Technologies and human capital, the merger of 3 state own Sharia Bank could be the answer and the room for researcher to analyze it in the future (the merger started in January 2021).

The comparison of the result of this study using VAR model that the critical point of Sharia Bank is to have sustainability of Fixed Yield Portfolios to Floating Yield Portfolios in order to improve Bank performance and the impact of Policy during Covid 19 is not long impact to Bank performance (the response will be normal after 6 months) while the result of Fakhri & Darmawan (2021) with the period data January 2020 to September 2020 using ANN suggesting to strengthen liquidity management based on the contribution of FDR and short term mismatch and the result of research by Ismal (2010) that strategy of Sharia Banking is to strengthen liquidity management. The result of this study is different with 2 others result because different time periods which in this study, the period does not just focus on the period of Covid 19.

CONCLUSION

Using VAR model with the period of Data June 2014 to February 2021, the forecasting of data has an accuracy minimum 87.5% for NOM to 97.3% for Fixed Yield Portfolios to Floating

Yield Portfolios. Based on the result in Impulse Response, Variance decomposition and Granger Causality Test show that the shock in policy will be responded by Banking performance in a short time (not more than four months) except for variable Fixed Yield Portfolios to Floating Yield Portfolios. The variable Fixed Yield Portfolios to Floating Yield Portfolios has a relationship (Granger Causality) to NOM, Operational Cost/Operational Income, ROA and Policy.

It is importance for Sharia Bank, beside to strengthen liquidity management, focus as well to have sustainability in maintained Fixed Yield Portfolios to Floating Yield and expanded the innovation product in Fixed yield portfolio to meet the expectation of customer regarding the pricing, the easy process of Murabaha contract in legal document and Sharia procedure.

The effect of the pandemic which causes economic downturn has not been reflected in NPF since there are some policies regarding economic stimulus and restructuring financing which Regulator has prepared well, however restructuring financing could be misleading to hide NPF until the restructuring period is ended. It also means Bank postpone to get profit in some period.

REFERENCES

- Abdul, T., & Mohamad, H. (2016). Granting of Ibra ' by Islamic Banks in Malaysia : A Matter of Discretion or Granting of Ibra ' by Islamic Banks in Malaysia : A Matter of Discretion or Obligation ? February.
- Aziz Chouikh, Youssef Blagui. (2017). The Determinants of Bank Performance: The Case of Tunisian Listed Banks. *Journal of Finance and Accounting.*; 5(2):53-60
- Bank Sharia Indonesia. (2021). Retrieved May 17th, 2021 from <https://www.ir-bankbsi.com/>
- Bahril, M. A., Maulayati, R. R., & Herianingrum, S. (2020). *Financial Ratio to Financing in Indonesia Islamic Rural Bank Analysis.* 6, 41–62.
- Indonesia Bank. (2021). Retrieved May 20th 2021 from <https://www.bi.go.id/id/statistik/ekonomi-keuangan/seki/Default.aspx>
- Ismal, R. (2010). Strengthening and improving the liquidity management in Islamic banking. *Humanomics*, 26(1), pp. 18-35.
- Damodar, Gujarati. (2012). *Econometric by Examples (2nd ed)*. New York: Palgrave Macmillan
- Disemadi, H. S., & Shaleh, A. I. (2020). Banking credit

- restructuring policy amid COVID-19 pandemic in Indonesia. *Jurnal Inovasi Ekonomi*, 5(02), 63–70
- Fakhri, U. N., & Darmawan, A. (2021). Comparison of Islamic and Conventional Banking Financial Performance during the Covid-19 Period. *International Journal of Islamic Economics and Finance (IJIEF)*
- Ganar, Y. B., Agrasadya, Dinantara, M. D., Apriansyah, M., Sahroni, Zulfitra, Sampurnaningsih, S. R., Rachmawaty, Noryani, Sari, W. I., Jati, W., Marjohan, M., Sarwani, Maddinsyah, A., & Sunarsi, D. (2020). The reaction of the sharia stock market in the early days of the Covid-19 pandemic in Indonesia. *Systematic Reviews in Pharmacy*, 11(11), 1516–1526
- Hajer, C., & Anis, J. (2018). Analysis of the Impact of Governance on Bank Performance: Case of Commercial Tunisian Banks. *Journal of the Knowledge Economy*, 9(3), 871–895.
- Hameed Shahul Bin Mohamed Ibrahim, Ade Wirman Bakhtiar Alrazi Mohd Nazli Bin Mohd. Nor Sigit Pramono. (2004) Alternative Disclosure & Performance Measures for Islamic Banks *Department Of Accounting International Islamic University Malaysia*
- Kattai, R. (2010). *Credit Risk Model for the Estonian Banking Sector Rasmus Kattai*
- Law, C., et al. (2019). Kajian Konversi, Merger, Holding, dan Pembentukan Bank BUMN Sharia. *Journal of Chemical Information and Modeling*, 53(1), 1689–1699.
- Liu, H., Wilson, J.O.S. (2010). The profitability of banks in Japan. *Applied Financial Economics*, 20(24), 1851-1866.
- Maulidizen, A. (2018). [*Jurnal Ilmiah Ekonomi Islam*, 4 (02), 2018 , 76-90 Analisis Kritis Pembiayaan Murabahah Dan Mekanisme Pricing Di Keuangan Islam Modern Indonesia]. 4(02), 76–90.
- Mohammad Yusuf, & Reza Nurul Ichsan. (2021). Analysis of Banking Performance in the Aftermath of The Merger of Bank Sharia Indonesia in Covid 19. *International Journal of Science, Technology & Management*, 2(2), 472-478.
- Nugroho, L., Buana, U. M., Utami, W., Buana, U. M., & Doktoralina, C. M. (2020). *Covid-19 And The Potency Of Disruption On The Islamic Banking. September, 2015–2018*
- Peraturan Otoritas Jasa Keuangan. (2016). [*Transparansi dan Publikasi Laporan Bank*]. Retrieved May 15th, 2021 from <https://www.ojk.go.id/id/kanal/perbankan/regulasi/peraturanojk/Documents/Pages/POJK-tentang-Perubahan-RegulasiTransparansi-dan-Publikasi-Laporan-Bank/POJK-PublikasiTransparansi.pdf>.
- Peraturan Otoritas Jasa Keuangan No 48 /POJK.03/2020. [*Stimulus Perekonomian Nasional ebagai Kebijakan Countercyclical Dampak Penyebaran Coronavirus Disease 2019*]. Retrieved May 15th, 2021 from <https://www.ojk.go.id/id/regulasi/Documents/Pages/Perubahan-Atas-Peraturan-Otoritas-Jasa-Kuangan-Nomor-11-tentang-Stimulus-Perekonomian-Nasional/Summary%20pojkk%2048-2020.pdf>.
- Otoritas Jasa Keuangan Indonesia. (2021). [*Statistik Perbankan Sharia*]. Retrieved May 15th, 2021 from <https://www.ojk.go.id/id/kanal/Sharia/data-dan-statistik/statistik-perbankan-Sharia/Default.aspx>
- Riffin, Amzul., Feryanto. (2021), *Analisis Time Series Model VAR-VECM* (Working Paper). Economic Management Faculty, IPB University, Indonesia
- SyariahPedia. Ensiklopedia Ekonomi Islam (2021). Retrieved at May 21th 2021 from <https://www.syariahpedia.com/2019/12/daftar-bpd-yang-konversi-menjadi-bank.html>
- Setiawan, A. B., Amilin., & Al Arif, M. N. R. (2020). Recent Development of Islamic Banking Performance Measurement. *Etikonomi: Jurnal Ekonomi*, 19(2)
- Sims, C. A., & Jan, N. (2007). *Macroeconomics and Reality*. 48(1), 1–48. *Econometrica*, Vol. 48, No. 1. (Jan., 1980), pp. 1-48
- Sinay, Lexy Jansen. 2014. [*Pendekatan Vector Error Correction Model untuk Analisis Hubungan Inflasi, Bi Rate dan Kurs Dolar Amerika Serikat*]. *Jurnal Berekeng* Vol. 8 No. 2 Hal. 9 – 8