MACROECONOMIC IMPACT OF SHARIA BUSINESS UNIT OF INDONESIAN ISLAMIC BANKING ON LIQUIDITY ASYMMETRIC APPROACH

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Abstract *: This study aims to determine the impact of macroeconomics on the liquidity of Indonesian Sharia Business Unit (SBU). The liquidity in this study uses the Financing to Deposit Ratio (FDR). In contrast, the Macro Factors used are Inflation, Rupiah to Dollar Exchange Rate, BI Rate and Gross Domestic Product (GDP). The method used Nonlinear Autoregressive Distributed Lag (NARDL) method with data from January 2015 - June 2022. The results showed that in the long term, that affect SBU liquidity are Positive Rate, Negative Rate, Positive GDP, and Negative GDP, in the short term Inflation, Exchange Rate, Rate, and GDP are both positive and negative. Results show that SBU liquidity is vulnerable to changes in Indonesia's macroeconomic factors.*

Keywords *:* ***Macroeconomic, Sharia Business Unit, Liquidity of Islamic Bank***

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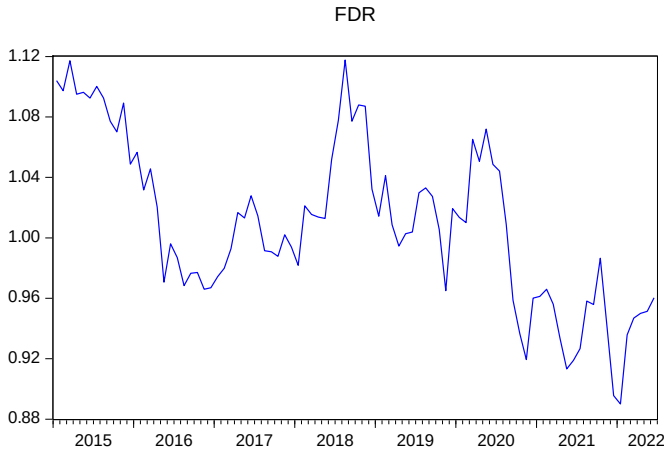
1. INTRODUCTION

Indonesia islamic banking has the opportunity to grow and develop (Nofinawati, 2016) . In 2021, The development of indonesian islamic banking assets in total reached IDR 693.80 trillion (OJK, 2022). Islamic banking, when compared to conventional banking, is less stable due to competition (Khattak et al., 2021). In Indonesia, there are several different institutions that carry out Islamic banking business activities. consisting of (1) Islamic Commercial Bank (ICB) banks whose main business activities are sharia business, and (2) Sharia Business Unit (SBU), which are conventional banks that have sharia business activities that are separate from the main conventional bank business activities.

As part of Islamic banking, the sharia business unit (SBU) has a assets in total IDR 243.79 trillion in 2021. On the liquidity aspect, SBU have Financing to Deposit Ratio (FDR) in 2021 of 89.56% and 2020 of 96.01%. (OJK, 2022). FDR indicates a change of 6.45%, where financing provided to customers has decreased from 2020. In SBU, liquidity management is at the parent bank. Because it is not managed directly ((Ismal, 2010). This shows that UUS liquidity decisions must be different from pure Islamic Banks.

Figure 1
Financing to Deposit Ratio SBU



Source : Financial Services Authority (OJK) (2022)

In FDR, it can be seen that the graph trend continues to fall even though it fluctuates. This indicates that the distribution of financing is experiencing a downward trend; the lowest was in January 2022 at 89.00%. The covid pandemic that started in March 2020 caused FDR to plunge far more.

Banking Liquidity is generally on macro factors affected by inflation(Trenca et al., 2015), but in Islamic banks, liquidity affected by inflation and GDP (Al-Harbi, 2020). In research (Mohamad et al., 2013)with Data Panel Method on liquidity Malaysian Islamic bank by ratio total deposit to total asset and data from 1994–2007, Shows inflation and GDP affect the liquidity. In research (Moussa, 2015) shows same result with difference liquidity ratio on liquidity Tunisian Islamic bank. Method used Data Panel by ratio asset liquid to total asset and total loan to deposit, data from 2000–2010, Shows inflation and GDP as macroecomomics factors affect the liquidity.

In research on Indonesian Islamic banking liquidity affected by inflation, exchange rate and benchmark interest rate. In research (Susandi et al., 2020) using the VAR / VECM method through monthly data from 2001-2015 with combined Indonesian Islamic banking data, the factors that affect liquidity in the long term are the most significant exchange rate and bi rate. In the short term bi rate, inflation, exchange rates. In research (Pertiwi & Sudarsono, 2020) shows result same as before with monthly data from January 2015-April 2019 on ICB Liquidity using ARDL on long term and short term liquidity affected by bi rate. both studies use the same ratio financing to deposit ratio (FDR).

In this study, we will look at the effect of macroeconomic factors on Islamic banking liquidity, especially in the Sharia Business Unit (SBU). The approach used uses an asymmetrical approach where the movement of the ups and downs of the independent variable will be seen as its influence on the dependent variable.

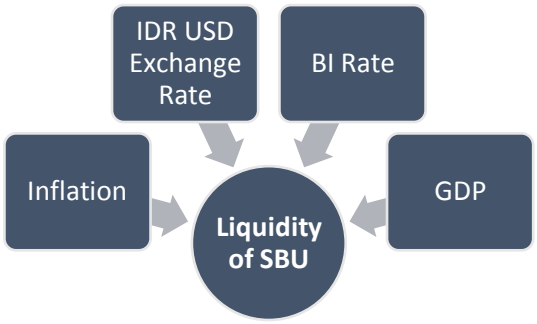
2. LITERATURE REVIEW AND METHOD

2.1 Sharia Business Unit (UUS)

Sharia Business Unit (SBU), according to Sharia Banking Law No.21 of 2008 on Sharia Banking, is a working unit of the head office of a Conventional Commercial Bank that functions as the parent office of an office or unit that conducts business activities based on Sharia Principles. UUS is present when Conventional Banks want to enter the Sharia business (Mainata, 2021). The Sharia Business Unit system started many Islamic Commercial Banks in Western countries. (Masvood, 2019).

In Malaysia, the UUS has a separate activity report from its parent bank (Abdulmajid & Hassan, 2011). In Indonesia, currently, the SBU report has been separated from its parent bank, this can be seen because the monthly aggregate data has been displayed on the Financial Services Authority (OJK).

Figure 2
Research Model



2.2 Method

Table 1
Data types and sources

Data	Symbol	Period	Source
Financing to Deposit Ratio	FDR	Jan 2015 – Jun 2022	OJK
Inflation	INF	Jan 2015 – Jun 2022	BI
IDR-USD exchange rate	LnKUrs	Jan 2015 – Jun 2022	BI
BI Rate	Rate	Jan 2015 – Jun 2022	BI
Gross Domestic Product	GDP	Q1 2015 – Q2 2022	BPS

The data used in this study are monthly timeseries secondary data from January 2015 to June 2022 or 90 observation data consisting of Inflation, IDR to USD Exchange Rate and BI Rate as well as quarterly timeseries from Q1 2015 to Q2 2022 consisting of GDP which will be processed into monthly data. Data obtained from the

Financial Services Authority (OJK), Bank Indonesia (BI) and the Central Bureau of Statistics (BPS). in this study using EViews 10 software for data processing.

Integration of GDP quarterly to monthly baseline data using the Chow-Lin (1971) method using E-Views application, GDP data has been shown to be reliable for disaggregation using the Chow-Lin method (Zhemkov, 2022). The sub-period estimation model with monthly GDP timeseries data can be simply described through the following model (Chamberlin, 2010).

$$\hat{y} = x\hat{\beta} + VB(B'VB)^{-1}\left[Y - B'x\hat{\beta}\right] \quad (1)$$

Where ($x\hat{\beta}$) is the linear relationship between the monthly indicator and the Monthly GDP series and (VB(B'VB)-1 [Y-B'x$\hat{\beta}$]) the additive restriction where the monthly difference in quarters and quarterly values are allocated to each month of the quarter.

NARDL is an extension of ARDL to analyze long-run relationships by looking at cointegration tests between time series variables. (Pesaran & Shin, 1999). (Shin et al., 2014) developed the *asymmetric ARDL cointegration* methodology, which uses positive and negative partial sum decomposition to detect asymmetric effects in both the long and short run. Following is the Research Model Formulation.

$$\begin{aligned}\Delta FDR_t = {} & \alpha + \partial_1 FDR_{t-1} + \partial_2^{+} INF^{+}_{t-1} + \partial_3^{-} INF^{-}_{t-1} + \partial_4^{+} LnKurs^{+}_{t-1} + \partial_5^{-} \\ & LnKurs^{-}_{t-1} + \partial_6^{+} Rate^{+}_{t-1} + \partial_7^{-} Rate^{-}_{t-1} + \partial_8^{+} GDP^{+}_{t-1} + \partial_9^{-} GDP^{-}_{t-1} \\ & \sum_{i=1}^{k-1} \beta_{1i} \Delta FDR_{t-1} + \sum_{i=1}^{l-1} \beta_{2i} \Delta INF^{+}_{t-1} + \sum_{i=1}^{m-1} \beta_{3i} \Delta INF^{-}_{t-1} + \\ & \sum_{i=1}^{n-1} \beta_{4i} \Delta LnKurs^{+}_{t-1} + \sum_{i=1}^{o-1} \beta_{5i} \Delta LnKurs^{-}_{t-1} + \sum_{i=1}^{p-1} \beta_{6i} \Delta Rate^{+}_{t-1} + \\ & \sum_{i=1}^{q-1} \beta_{7i} \Delta Rate^{-}_{t-1} + \sum_{i=1}^{r-1} \beta_{8i} \Delta GDP^{+}_{t-1} + \sum_{i=1}^{s-1} \beta_{9i} \Delta GDP^{-}_{t-1} + \varepsilon_t\end{aligned} \quad (2)$$

3. RESULTS AND DISCUSSION

3.1 Results

Data Stationary Test

The data stationarity test uses the Phillips Perron (PP) test with the null hypothesis that the data has a unit root. The PP unit root test approach suggests a nonparametric method to control for higher order serial correlation in a series, while also explaining the presence of autocorrelation between residuals without including the independent variable of differential lag. In principle, the unit root test is intended to observe whether certain coefficients of the estimated model have a value of one or not. The PP approach for the tests and facilitates comparisons with alternative procedures due to Dickey & Fuller's (Phillips & Perron, 1988) .The Phillips-Perron test results show that the LNKURS and GDP variables are stationary at the level. In the first difference, all variables have probability values that are less than the fundamental level of 1 percent.

Table 2
Data Stationary Test

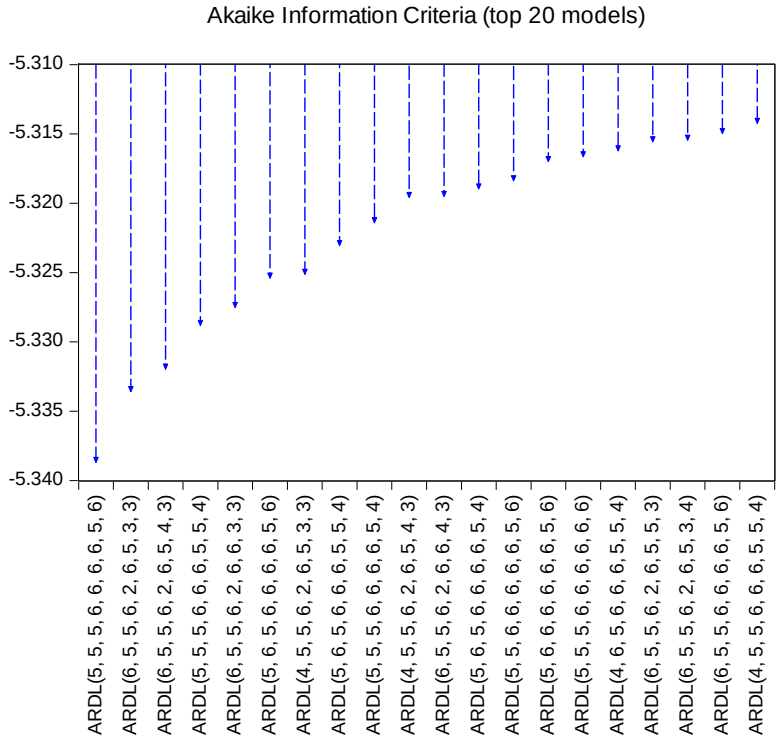
Variable	*Level*	*First Difference*
FDR	0.1513	0.0000***
INF	0.1540	0.0000***
LNKURS	0.0384***	0.0001***
RATE	0.4778	0.0000***
GDP	0.0000***	0.0001***

Source : EViews 10 processed data (2023)

Optimum Lag

Determination of the optimum lag in NARDL modeling by considering the Akaike Information Criterion (AIC) value by including the maximum dependent and independent lags. NARDL optimum lag (5, 5, 5, 5, 6, 6, 6, 6, 6, 5, 6) is obtained. The NARDL model built has good results, this can be seen from the large R^2 value (0.971). The adjusted R2 value of the ARDL model is 0.903, meaning that 90.3 per cent of the SBU liquidity value can be explained by the independent variables in the model.

Figure 3
NARDL Optimum Lag



Source : EViews 10 processed data (2023)

Cointegration Test

Identification of long-run relationship using cointegration test. The cointegration test in the model is conducted by comparing the F-statistic value against the lower bound I(0) and upper bound I(1) following the Bound Testing Cointegration according to (Pesaran et al., 2001).

Table 3
Bound Testing Model

MODEL	F-statistic	Signif	I(0)	I(1)
		10%		
NARDL	5.912401		1.85	2.85

Source : EViews 10 processed data (2023)

The results of the cointegration test on the NARDL model, the F-statistic value is greater than the upper bound value of I(1). Thus, it can be concluded that the NARDL model is cointegrated or has a long-term relationship between the independent and dependent variables. Lag error correction term modelling NARDL has a negative sign and is significant (-1.708224). This is in accordance with the results of the cointegration test using Bound Testing Cointegration Pesaran et al. (2001) in the Cointegration Test, where the NARDL model has a long-term relationship on macro factors and liquidity variables.

Classical Assumption Test

Table 4
Classical Assumption Test

Test	Type	Value
Autocorrelation	Prob. F	0.2034
Heteroscedasticity	Prob.Chi-Square	0.6780
Normality	Jarque-Bera	0.902502

Source : EViews 10 processed data (2023)

The Autocorrelation Test results show that the F-statistic probability value of 0.2034 in the NARDL model is greater than the 5 percent fundamental level. Thus, it can be concluded that the NARDL model is free from autocorrelation. Each error factor or the residuals is not correlated.

The heteroscedasticity test results show that the model's chi-square probability value of 0.67080 in the NARDL model is greater than the 5 percent fundamental level. Thus, it can be concluded that the residuals in the NARDL model do not have heteroscedasticity problems.

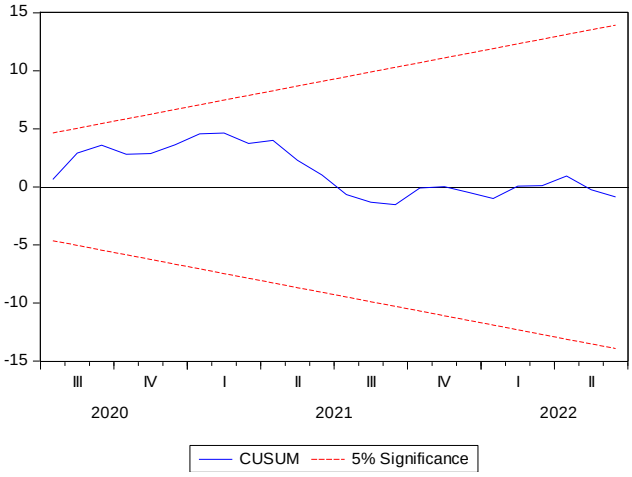
The normality test results show that the probability value of 0.9025 in the NARDL model is greater than the 5 percent fundamental level. The result indicates that the model cannot reject the null hypothesis or the model is valid.

Model Validity and Stability

The probability value in the NARDL model shows a value of 0.4418 which is greater than the fundamental level of 5 percent. The result indicates that the model cannot reject the null hypothesis or the model is valid.

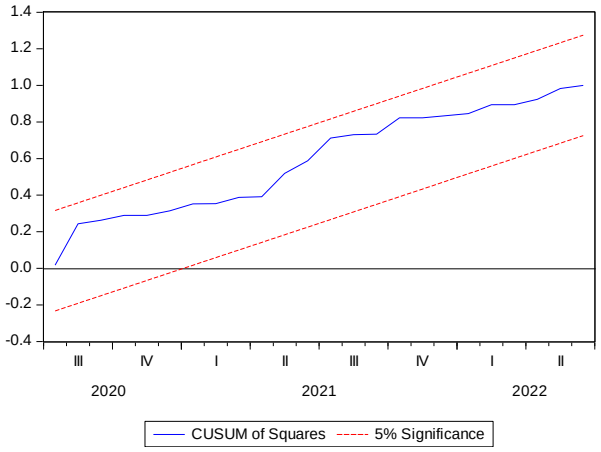
The CUSUM and CUSUMSQ movement models are within the significance line. Thus, the model can be declared valid.

Figure 4
NARDL CUSUM Model



Source : EViews 10 processed data (2023)

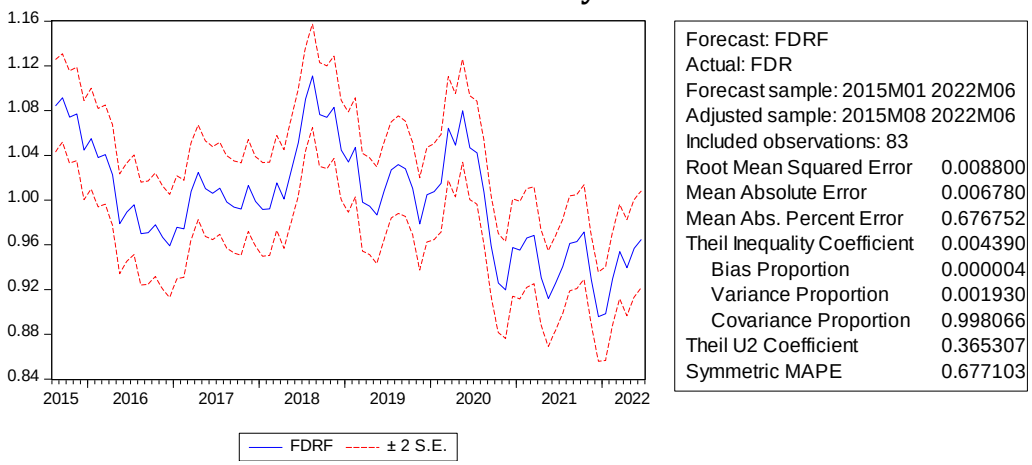
Figure 5
NARDL CUSUMSQ Model



Source : EViews 10 processed data (2023)

Accuracy of Model Estimation

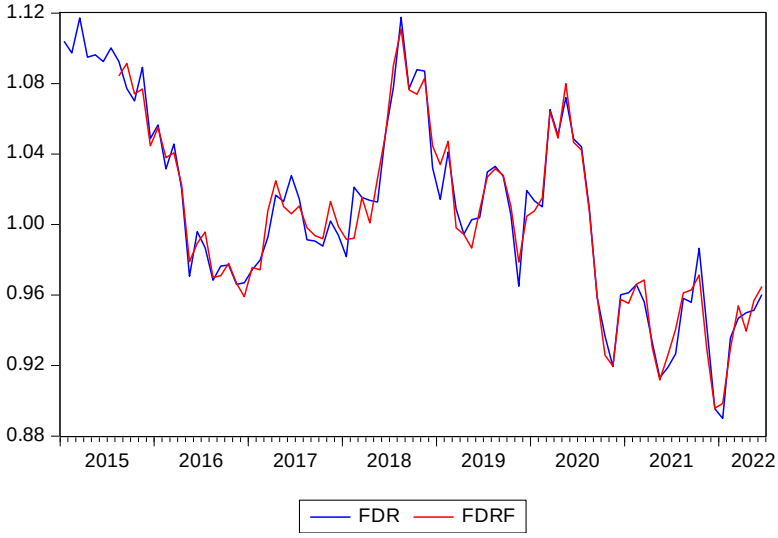
Figure 6
Model Accuracy Test



Source : EViews 10 processed data (2023)

The NARDL model shows accuracy test results by the RMSE and MAE values. The RMSE value is close to 0 (0.0088), and MAE is close to 0 (0.0067). This shows that the model has a high level of estimation accuracy.

Figure 7
Model estimation results



Source : EViews 10 processed data (2023)

Looking at the liquidity estimation graph in the model shows that the liquidity estimation results tend to move closer to the actual liquidity indicators. Thus, it can be stated that the NARDL model has good accuracy.

Long and Short-Term Relationships and Asymmetrical Relationships

Table 5
Long-term Asymmetric Effects

Long-term Asymmetric Effects $(W)_{LR}$	
Prob. W_{LR} INF	0.7709
Prob.W_{LR} LNKURS	0.0129***
Prob. W_{LR} RATE	0.3551
Prob. W_{LR} GDP	0.1100*

Source : EViews 10 processed data (2023)

Table 6
Short-term Asymmetric Effects

Short-Term Asymmetric Effects $(W)_{SR}$	
Prob. W_{SR} INF	0.2512
Prob. W_{SR} LNKURS	0.0040***
Prob. W_{SR} RATE	0.9783
Prob. W_{SR} GDP	0.2474

Source : EViews 10 processed data (2023)

Table 7
Short and long term relationships

Variable	Coefficient	Prob.
α	1.778842	0.0000***
FDR(-1)	-1.70822	0.0000***
INF+(-1)	0.786673	0.6643
INF-(-1)	1.151403	0.3515
LNKURS+(-1)	-0.96496	0.2498
LNKURS-(-1)	-0.11843	0.8639
RATE+(-1)	2.712682	0.0439***
RATE-(-1)	0.484426	0.7870
GDP+(-1)	1.162402	0.2775
GDP-(-1)	0.393295	0.6775
Δ(FDR(-1))	0.721085	0.0094***

Variable	Coefficient	Prob.
Δ(FDR(-2))	0.62321	0.0125***
Δ(FDR(-3))	0.441079	0.0180***
Δ(FDR(-4))	0.181611	0.2548
Δ(INF⁺)	-2.70501	0.1833
Δ(INF⁺(-1))	-2.00415	0.4994
Δ(INF⁺(-2))	-1.00157	0.7268
Δ(INF⁺(-3))	2.859889	0.3164
Δ(INF⁺(-4))	6.871073	0.0506**
Δ(INF⁻)	-0.00711	0.9975
Δ(INF⁻(-1))	0.266869	0.8996
Δ(INF⁻(-2))	-2.71691	0.1421*
Δ(INF⁻(-3))	-0.84872	0.6499
Δ(INF⁻(-4))	-5.99944	0.0020***
Δ(LNKURS⁺(-1))	1.012439	0.1895
Δ(LNKURS⁺(-2))	0.846366	0.1168*
Δ(LNKURS⁺(-3))	0.573535	0.1925
Δ(LNKURS⁺(-4))	1.023325	0.0141***
Δ(LNKURS⁺(-5))	0.897696	0.0125***
Δ(LNKURS⁻)	-0.09747	0.7895
Δ(LNKURS⁻(-1))	-0.5956	0.2442
Δ(LNKURS⁻(-2))	0.124962	0.8227
Δ(LNKURS⁻(-3))	-0.28564	0.5213
Δ(LNKURS⁻(-4))	-0.6379	0.0695**
Δ(LNKURS⁻(-5))	-0.47449	0.1241*
Δ(RATE⁺)	2.506417	0.5433
Δ(RATE⁺)(-1))	-2.53916	0.5157
Δ(RATE⁺)(-2))	8.690384	0.0469***
Δ(RATE⁺)(-3))	9.982872	0.0277***

Variable	Coefficient	Prob.
Δ(RATE⁺)(-4))	0.298661	0.9440
Δ(RATE⁺)(-5))	7.574956	0.0702**
Δ(RATE⁻)	3.581105	0.1756
Δ(RATE⁻)(-1))	4.477596	0.0422***
Δ(RATE⁻)(-2))	4.927526	0.0535**
Δ(RATE⁻)(-3))	2.229631	0.2316
Δ(RATE⁻)(-4))	7.952914	0.0021***
Δ(RATE⁻)(-5))	3.083897	0.2509
Δ(GDP⁺)	-0.09666	0.8235
Δ(GDP⁺)(-1))	-0.46946	0.5231
Δ(GDP⁺)(-2))	-0.8939	0.3128
Δ(GDP⁻)(-3))	-1.31894	0.0925***
Δ(GDP⁻)(-4))	-0.34132	0.5115
Δ(GDP⁻)(-5))	-0.69123	0.2221

Source : EViews 10 processed data (2023)

3.2 Discussion

a) The Effect of Inflation on Liquidity

In the long term, inflation has no positive or negative effect in the Wald test; the value is more than 15%, meaning there is no real difference in the impact of increasing and decreasing inflation on FDR liquidity in the long term.

In the short term, the positive and negative INF variable influences a fundamental level of 15% on FDR. The positive INF variable has a coefficient value of 0.46. where positive INF rises 1 percent causing FDR to rise 0.46 percent. The negative INF variable has a coefficient value of 0.67. where negative INF decreases by 1 percent, causing FDR to increase by 0.67 percent. The Wald test found that the value is more than 15%, meaning that there is no real difference in the effect of increasing and decreasing Inflation on FDR liquidity in the short term. The results show similar with (Al-Harbi, 2020; Mohamad et al., 2013; Moussa, 2015; Trenca et al., 2015) that inflation does have an effect on SBU liquidity. The effect only in the short term, same research as (Susandi et al., 2020).

b) The Effect of the Rupiah Dollar Exchange Rate on Liquidity

In the long term, LNKURS has no effect, either positive or negative In the Wald test, the value is less than 15%, meaning that there is a real difference in the impact of increasing and decreasing Lnkurs on FDR liquidity in the long term.

In the short term, the positive and negative LNKURS variable influences a fundamental level of 15% on FDR. The positive LNKURS variable has a coefficient value of -0.56. A positive LNKURS increase of 1 percent causes FDR to decrease by 0.56 percent. The negative LNKURS variable has a coefficient value of -0.06. A negative LNKURS decrease of 1 percent causes LNKURS to increase by 0.06 percent. The Wald test found that the value is less than 15%, meaning there is a real difference in the effect of increasing and decreasing Inflation on FDR liquidity in the short term. The results show different with (Susandi et al., 2020) that exchange rate does have an effect on SBU liquidity in long term. The effect only in the short term.

c) The Effect of BI Rate on Liquidity

In the long term, the positive rate has an effect. The negative rate has no impact on the Wald test found that the value is more than 15%, meaning that there is no real difference in the effect of increasing and decreasing the BI Rate on FDR liquidity in the long term.

In the short term, positive and negative rate variables influence a fundamental level of 15% on FDR. The positive RATE variable has a coefficient value of 1.58. where a positive RATE rises 1 percent causing FDR to rise 1.58 percent. The negative RATE variable has a coefficient value of 0.28. where the negative RATE drops by 1 percent, causing the RATE to drop by 0.28 percent. The Wald test found the result is more than 15%, meaning that there is no real difference in the effect of increasing and decreasing RATE on FDR liquidity in the short term. The results show similar with (Pertiwi & Sudarsono, 2020; Susandi et al., 2020) that benchmark interest rate does have an effect on SBU liquidity. The effect in the long term and the short term.

d) The Effect of Gross Domestic Product on Liquidity

In the long term, GDP has no effect, either positive or negative In the Wald test, the value is less than 15%, meaning that there is a real difference in the effect of increasing and decreasing GDP on FDR liquidity in the long term.

In the short term, positive and negative GDP variables influence a fundamental level of 15% on FDR. The positive GDP variable has a coefficient value of 0.68. where positive GDP increases by 1 percent, causing FDR to increase by 0.68 percent. The negative GDP variable has a coefficient value of 0.23. where negative GDP falls by 1 percent, causing FDR to fall by 0.23 percent. The Wald test found that the value is less than 15%, meaning there is a real difference in the effect of increasing and decreasing Inflation on FDR liquidity in the short term. The results

show similar with (Al-Harbi, 2020; Mohamad et al., 2013; Moussa, 2015) that GDP does have an effect on SBU liquidity.

4. CONCLUSION

SBU liquidity has little effect in the long term, that affects the liquidity of sharia business unit is Rate Positive. The result shows that the BI Rate increase influences SBU's liquidity. In the short term, all macro variables have an influence; this means that all macro variables, either up or down, influence SBU's liquidity.

Based on the Research and discussion results, SBU should be very concerned about macroeconomic factors, especially in the short term. This is intended so that liquidity conditions remain safely under control and for further Research can conduct liquidity assessments using other liquidity and macroeconomic parameters and consider asymmetrical factors the dependent variable.

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