Research Paper

Are the Financial Indicators Relevant in Measuring the Performance of Islamic Banks?

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Abstract.
This study was directed to determine the impact of financial indicators compiled in public reports on the long-term and short-term performance of Islamic banks in Indonesia. The scope of this study is between 2017 and 2021. This study uses the Vector Error Correction Model (VECM) method. The analytical steps used in VECM modeling are Granger causality, long-term and short-term VECM analysis, impulse response functions, and variance decomposition. Results of this study show that the independent variables subsisting of BOPO, CAR, FDR, MFP, NPF, and STM have long-term effects on ROA. However, CAR variables do not show significant impacts in the short term. The implications of this research are to back business efficiency in other banking services such as safe deposit boxes, hedging activities, and manufacturing sector financing based on more accountable and credible risk management. The freshness of this study is that it incorporates the results of Granger causality analysis, which reveals bidirectional relationships for each variable. In addition, Granger causality shows correlations, allowing study variables to be explored more deeply in further studies.

Keywords: financial indicators, Vector Error Correction Models, Islamic banks, performance

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1. Introduction

The structure of financial institutions has undergone various changes. This change is being made to meet people's needs for increasingly diverse financial products. One form of his innovation that exists is Islamic financial products and banking. An Islamic bank is a bank that operates under Islamic Shariah. Based on the type and focus of financial activities carried out, Islamic banks are divided into two kinds, namely Islamic commercial banks and Islamic rural credit banks (Agza & Darwanto, 2017).

Islamic banking is indicated to have experienced a steady increase in the past few years. Recorded in 2017 the total assets managed by Islamic banks in Indonesia reached 288 trillion Rupiah. While the amount of capital and third-party funds respectively amounted to 31 trillion and 238 trillion Rupiah. The amount of the three data increased

in 2018 to 316 trillion Rupiah for total assets managed, 36 trillion for capital owned and 257 trillion for funds. managed third party. The upward trend continued in 2019 with the number of assets managed at 350 trillion Rupiah, the amount of capital held at 40 trillion Rupiah, and the amount of third-party funds. 288 trillion rupiah. In 2020, Islamic banking in Indonesia was recorded to have total assets of 397 trillion Rupiah, with capital held of 46 trillion Rupiah and the amount of third-party funds. 322 trillion rupiah. With the increase owned by Islamic banking, it also shows the growth of the contribution of the Islamic banking sector to the financial sector in Indonesia. The development achieved by Sharia banks is supported by several policies of OJK and Bank Indonesia in advancing the existing Sharia economic climate in the community. Bank Indonesia, which holds the role of the central bank in Indonesia, provides policy innovation stimulus that spurs the development of Islamic banks in Indonesia. Some of the policies developed include Sharia RIM Current Account, Risk-Free Reference Interest Rate, FX Term Deposit, Wakalah Facility, Liquidity Repo Facility, and Halal Value Chain Ecosystem Development which includes Sharia financing for the community (Bank Indonesia, 2021b)(Bank Indonesia, 2021a).

In addition to Bank Indonesia, the Financial Services Authority (OJK) also encourages the development of Islamic banking institutions. OJK has issued regulations regarding restrictions on the allocation of funds by Islamic commercial banks. This limit on the distribution of funds is stated in POJK No. 26/POJK.03/2021 concerning the Maximum Limit for The Distribution of Funds and Large Funds for Sharia Commercial Banks (Otoritas Jasa Keuangan, 2021a). This regulation is prepared to maintain the health of Islamic banks and the implementation of quality risk management in distributing funds in the form of financing to the community. This policy also states that Islamic banking is encouraged to synergize with other sectors of the Islamic finance industry for the benefit of financing the real sector and the social sector with the aim of benefiting the people. This financing stimulus also refers to how risk management is managed to encourage the integration of a stable Islamic finance ecosystem in accordance with Indonesia's Islamic banking roadmap 2020-2025. In addition to this policy, OJK also cooperates with Financial Services Authority from Dubai and carries out the implementation of the National Deliberation of Masyarakat Ekonomi Syariah with the aim of to spur maximum development of the Islamic banking industry (Otoritas Jasa Keuangan, 2021b). This policy is also one of the supporters for the development of the Islamic financial and banking sector in Indonesia (Otoritas Jasa Keuangan, 2021c).

The development of the potential of Islamic banking stimulates new studies on the performance of Islamic banks in Indonesia over the past 5 years. Therefore, this study

examines the impact of the value of banks' financial measures on bank performance as measured by profitability. The error-correction vector model was chosen because it can facilitate the analysis of time series and the prediction of the variable quantities tested. These two analytical approaches are the most commonly used analytical methods in economics, especially in financial and policy planning (Dwiputri et al., 2019). Indicators of Islamic banking mentioned in this study include distressed funding data, the funding-to-deposit ratio, the capital adequacy ratio, the operating expense-to-operating income ratio, mudharabah allocations, and the short-term inadequacy of Islamic banking. Therefore, the study will use VECM modeling as the data analysis method, with the data used being Islamic banking statistics collected by the Financial Services Authority (OJK). The impact of these financial indicators becomes research implications to help the banking sector adapt to post-pandemic conditions through the development of Shariah banking policies. The application of two-way analysis via Granger Causality is the value of novelty in comparison with previous studies raised in this study. The goal of this analysis is to discover the evidence of each variable's two-way influence. This method was chosen because no findings of a two-way correlation have been found in several previous studies.

2. Literature Review

2.1. Banking Indicator

In some literatures, bank performance as measured by profitability is generally influenced by macroeconomic conditions, operational quality (Jara□Bertin et al., 2014), credit risk (Sufian & Noor Mohamad, 2012), and financial sector market concentration (Osuagwu, 2014). This shows that the dynamics of management of the banking sector are influenced by factors both from within and outside the banking institution itself (Osuagwu, 2014).

In order to bank performance, loan quality has a significant negative influence on the overall bank performance (Sahyouni & Wang, 2018). There are indications that an increase in credit risk will affect the profitability of banks (Panta, 2018)(Saputra, 2022). On the other hand, higher profitability diminishes the level of bank credit risk(Abdelaziz et al., 2020). The percentage apportionment of financing adds a significant and positive value to the return on bank assets (Lambe & Tandi, 2021)(Sudarsono, 2017). Furthermore, the murabahah and musyarakah financing by Islamic banks has a significant and positive effect on the ROA of Islamic banks themselves (Agza & Darwanto, 2017). An additional

study also tested an indication of the influence of commercial banks' ROA on the quantity of credit granted (Sidharta et al., 2021).

The loan-to-deposit ratio had a significant impact on the profitability of exchange-listed banks (Pranata, 2015). This influence is demonstrated both partially and concurrently with other variables such as CAR, BOPO, and NPL (Nuryanto et al., 2020). In another study, the loan-to-deposit ratio influenced the net interest margin but had no effect on the return on banking assets. However, the net interest margin can mitigate the impact of the loan-to-deposit ratio on the return on assets (Susilawati & Nurulrahmatiah, 2021). Financing to deposit ratios variable in Islamic banking can also have a significant and positive effect on profitability in a short period of time (Sudarsono, 2017).

Capital Adequacy Ratio (CAR) is known to have a statistically significant negative relationship with banking performance indicators (Dao & Nguyen, 2020). The higher CAR managed by banks will tend to reduce the value of return on equity (ROE) and net interest margin (NIM) (Hersugondo et al., 2021). However, bank desecration as measured through the capital adequacy ratio tends to be able to improve the efficiency of banking operations (Lotto, 2018). On the contrary, increasing the capital managed by banks will provide a wider choice for banks in managing efficient operations (Irawati et al., 2019) This is supported by the finding that capital ratios have a significant and positive influence on bank profitability (Jara Bertin et al., 2014)(Hassan & Bashir, 2003)(Obilikwu, 2018). In addition, the management of banking business capital will provide benefits for banks in the face of uncertain conditions in the future (Saleh & Abu Afifa, 2020). The high capital adequacy ratio will also drive profitability and facilitate risky financing (Anggreni & Suardhika, 2014).

The BOPO ratio managed by various banking lines reflects the opposite result. In the regional banking sector, the BOPO Ratio has a negative influence on bank profitability (Buchory, 2015). The BOPO ratio of Islamic banks in Indonesia in previous studies does not reflect the efficiency that arises because it has a negative influence on the return on Islamic banking assets (Kusumastuti & Alam, 2019)(Kusumastuti & Alam, 2019). This is also true even with the spin-off policy of the central bank on Islamic banking which tends to have a positive influence (Hamid, 2015). Conventional banks also need to minimize BOPO rates as an effort to maximize the income received by banks (Karamoy & Tulung, 2020).

Short term mismatch is a ratio that can be used to measure banking health through liquidity indicators. Liquidity risk itself is caused by the existence of asset components with high liquidity, dependence on external financing, policy factors and macroeconomics of the country (Chen et al., 2018). Banking liquidity measurement efforts have

a positive influence on the value of profitability (Trad et al., 2017)(Koroleva et al., 2021). High liquidity will define the improved performance experienced by banks (Alim et al., 2021). However, the creation and addition of liquidity actually increases the tendency of banking in bankruptcy due to a decrease in profitability (Sahyouni & Wang, 2018)(Obilikwu, 2018).

2.2. Research Framework

Figure 1 - Research Framework

2.3. Models & Hypothesis Formulation

This research compiled with a quantitative approach, which is a research approach that focuses on empirical analysis of events through numerical data (Walliman, 2011) The data analysis method used in this study is a descriptive method with the aim of explaining phenomena that exist in society through research (Walliman, 2011).

Therefore , the development of the equation model used in this study will refer to the VECM equation put forward earlier by Enders (2015) as follows.

$$\Delta y_t = a_0 + a_1 t + \Pi y_{t-1} + \sum_{i=1}^{p-1} \Gamma_i \Delta y_{t-1} + u_t \quad (1)$$

Equation 1 - Vector Error Correction Model Equation

Where:

yt = endogenous variables used in the study (includes ROA, STM, CAR, BOPO, MFP, FDR and NPF),

a_0 = column vector that includes intercepts with sizes (n × 1),

a_1 = vector coefficient of time trend (t),

Π = αβ, where the α is the adjustment matrix and the β is the co-integration equation of the long-term relationship,

Γ_i = a matrix of regression coefficients measuring n × n, and

u_t = error matrix

Thus, the regression model proposed in this study is as follows.

$$ROAt = C1 + \sum_{i=1}^{n} \alpha_1 i ROA_{t-i} + \sum_{i=1}^{n} \alpha_1 i BOPO_{t-i} + \sum_{i=1}^{n} \alpha_1 i CAR_{t-i} + \sum_{i=1}^{n} \alpha_1 i FDR_{t-i} + \sum_{i=1}^{n} \alpha_1 i MFP_{t-i} + \sum_{i=1}^{n} \alpha_1 i NPF_{t-i} + \sum_{i=1}^{n} \alpha_1 i STM_{t-i} \quad (2)$$

Equation 2 - Regression Equation

Based on the previous literature review, this study will attempt to identify the variables that influence ROA in the long and short term. This study will attempt to reveal how the independent variable influences the long and short terms. This study will also look at how the response of the ROA variable affects the shocks that occur in each variable. Finally, this study will predict future changes in the magnitude of each variable's influence on the value of the ROA variable.

3. Result & Discussion

The VECM analysis findings demonstrate that in the long run, all variables have a significant affect on the return on assets in Islamic banking. In the long run, the CAR, FDR, and NPF variables have a detrimental effect. Only the CAR variable has no effect in the short term, and the FDR variable has a bad influence on the return on assets of Islamic banking.

In granger causality analysis show that there are several variables that have a two-way relationship. These variables include STM and BOPO, STM and MFP, ROA and NPF, and STM and NPF. This suggests that the variables could potentially have relationships that affect each other. The relationship will support interpretations of some previous tests such as co-integration tests and strengthen the results of variance decompositions analysis and impulse response function analysis. These results also suggest that each variable may act as an independent variable in future research. In addition to the two-way relationship, the results of this granger causality analysis also showed a one-way relationship, namely BOPO variables that have relationships on MFP and STM variables that have relationship with ROA.

The results of the variance decomposition show that there are indications of a decrease in influence from ROA to the tenth period. This means that in the tenth period, the ROA variable is not the dominant variable that exerts influence over the value of the ROA itself in that period. This suggests that each of these variables tends to be slower and unchanged over the longer time dimensions of exerting an influence on the ROA variable. In addition, the magnitude of influence with a low degree of fluctuation will show variables are quite rigid when adapting to changes in time in exerting an influence on dependent variable or ROA. The findings in the impulse response function analysis describe considerable response fluctuations occurring during the test period of shocks occurring in BOPO, CAR, and MFP. This indicates that the influence of the length of the

Table 1: VECM Result.

Long-run VECM		
Variables	Coefficient	t-statistic
D(ROA(-1))	1.000000	-
D(BOPO(-1))	0.123929	28.1253**
D(CAR(-1))	-0.030342	-3.26530**
D(FDR(-1))	-0.011621	-2.94494**
D(MFP(-1))	0.049151	2.81011**
D(NPF(-1))	-0.047090	-2.83279**
D(STM(-1))	0.006847	3.58688**
C	0.010774	-
Short-run VECM		
CointEq1	-2.149383	-1.96748
D(ROA(-1),2)	2.170795	2.29238**
D(BOPO(-1),2)	0.354620	2.81722**
D(BOPO(-2),2)	0.280849	2.35238**
D(FDR(-1),2)	-0.059343	-2.97944**
D(FDR(-2),2)	-0.061040	-2.26035**
D(FDR(-3),2)	-0.053726	-2.20675**
D(FDR(-4),2)	-0.086880	-3.65189**
D(FDR(-5),2)	-0.064706	-3.02508**
D(MFP(-2),2)	0.211722	2.15760**
D(MFP(-3),2)	0.264109	2.33132**
D(MFP(-4),2)	0.243741	2.50723**
D(NPF(-4),2)	0.250801	2.10965**
D(STM(-3),2)	0.024440	2.38972**
C	0.012874	0.80217
R-squared		0.910631
Adj. R-squared		0.709551
F-statistic		4.528694

Note: **p<0.05

period will determine the dynamics of the change in ROA response due to the shock of the variable.

According to the VECM analysis results, all variables have a long-term significant effect on the ROA variable. This study provides an update on several previous studies that were previously discussed. Furthermore, long-term findings indicate that BOPO, MFP, and STM have a positive impact on banking performance as measured by ROA. The findings on the BOPO variable contradict previous Buchory research (2015). The findings on MFP and STM, on the other hand, support the findings of previous research from Agza and Darwanto (2017) and Trad et al (2017). The findings of this study will provide

Table 2: Granger Causality Result.

Null Hypothesis	Obs	F-statistic	Prob.
MFP does not Granger Cause BOPO BOPO does not Granger Cause MFP	54	1.13644 2.70361	0.3588 0.0264**
STM does not Granger Cause BOPO BOPO does not Granger Cause STM	54	3.79463 3.29414	0.0043** 0.0097**
STM does not Granger Cause MFP MFP does not Granger Cause STM	54	2.76485 2.87657	0.0238** 0.0238**
ROA does not Granger Cause NPF NPF does not Granger Cause ROA	54	2.64724 2.82528	0.0291** 0.0215**
STM does not Granger Cause NPF NPF does not Granger Cause STM	54	2.68687 2.99618	0.0272** 0.0161**
STM does not Granger Cause ROA ROA does not Granger Cause STM	54	2.78191 2.13227	0.0231** 0.0701

Note: **p<0.05

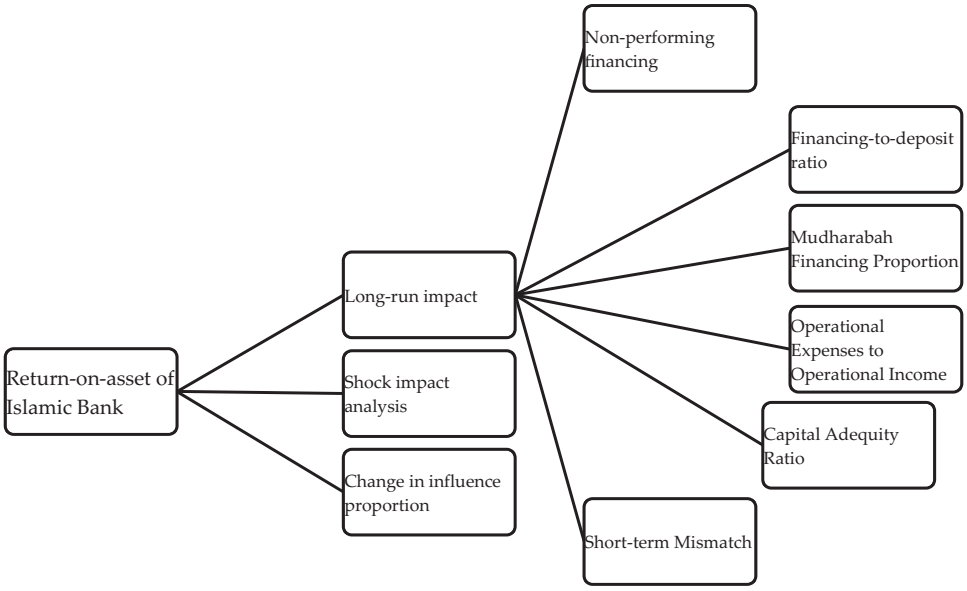

Figure 1: (a) Variance decompositions result; (b) Impulse response function.

long-term model results that will be more useful than previous studies in projecting the stability of the influence.

The variables CAR, FDR, and NPF all have a negative impact on ROA. The findings on CAR contradict the findings of Hersugondo et al (2021), but support the findings of Anggreni and Suardika's research (2014). The same thing happened with the FDR variable, which contradicts Sudarsono's previous research (2017). Previous research from Sahyouni and Wang (2018) found that the NPF variable had a negative effect on the ROA variable, which is relevant to the findings of this study. Long-term analysis is a novel feature of this study that reinforces findings that are both relevant and contradictory to previous research.

4. Conclusion

This research seeks to uncover the relationship and influence of banking financial indicators on banking performance. The results of this study showed that independent variables consisting of BOPO, CAR, FDR, MFP, NPF, and STM exerted a long-term influence on dependent variables, namely ROA variables. However, in the short term, the CAR variable does not show a significant influence. Partially in VECM modeling, the BOPO, MFP, and STM variables exert significant positive influences in the long and short term. In contrast, the variables FDR and NPF have significant negative effects in the short and long term. The CAR variable is recorded to only have a significant negative influence in the long run. This suggests that financial indicators related to banking risk tend to have a negative influence on banking performance. Meanwhile, results of impulse response function analysis state that all variables exert an influence resulting in changes in response given by ROA variables. In addition, results of variance decompositions analysis stated that there was a change in the influence of each variable tested in the study. Magnitude of the influence of each variable on the ROA variable will change in the projections carried out. The results of the granger causality show that there are several variables that have a two-way relationship, which includes the pair of variables STM and BOPO, STM and MFP, ROA and NPF, and STM and NPF.

The results of this study also indicate that banks need to consider efforts to diversify asset management. In addition, banks are also encouraged to expand their business in the sharia banking service sector based on sharia principles. The findings of this study explain why financial services other than credit are important. This is because financial services are the driving force behind Islamic banking's long-term profitability. Other financial services must be provided by the stigma and market segment of Islamic banking in the financial sector, which prioritizes the health and security of financial services. Islamic banking can investigate a digital Islamic financial system that makes it easier for customers to apply for safe-haven assets like gold, securities, and precious metals. The limitation in this study is that it does not present comparison analysis with conventional banking. This is due to the fact that conventional banking operates on a different financial model than Islamic banking. Furthermore, the analysis raised does not discuss the legal basis for the two banking entities' various activities. Further research will undoubtedly necessitate qualitative and quantitative analysis. Thus, the recommendations given in the next study are to conduct a comparison analysis with conventional banks.

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