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THE INFLUENCE OF PROBLEM FINANCING ON THE PERFORMANCE OF SYARIAH BANKS IN INDONESIA

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Abstract

In the context of economic globalization, the Islamic banking sector has demonstrated significant growth. However, a major challenge faced by Islamic banks is the high ratio of Non-Performing Financing (NPF), which can hinder the banks' financial performance. This study aims to investigate whether problematic financing, known as Non-Performing Financing (NPF), affects the financing performance of Islamic banks in Indonesia during the 2014-2023 period. The research adopts a quantitative approach using Time-Series methods and analytical techniques such as Vector Error Correction Model (VECM) to evaluate the relationship between Non-Performing Financing (NPF) and Return on Assets (ROA) and Capital Adequacy Ratio (CAR) as indicators of bank performance. The findings of this study reveal a negative relationship between NPF and both ROA and CAR, considering the importance of risk management in maintaining the performance of Islamic banks. This research contributes to understanding the performance dynamics of Islamic banks in Indonesia and their implications for financial system stability.

Keywords:Non-Performing Financing (NPF), ROA, CAR, Islamic bank performance

INTRODUCTION

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In the current era of globalization and increasing economic complexity, Islamic banking in Indonesia has been able to develop rapidly, establishing itself as a force to be reckoned with in the dynamics of national banking.(Nisa et al., 2024). This is based on statistical data on Islamic banking with the growth of the business industry in the Islamic financial system in Indonesia which is increasing and continues to progress. In addition, it is also driven by the increasing preference of the community for the modernization of financial services based on Islamic principles which will support the stability of the national financial system.(Wibowo & Syaichu, 2013).

In Indonesia, Islamic banking began with the establishment of Bank Muamalat in 1991, namely as a form of response to the need for financial services in accordance with Islamic principles.(Main, 2018). Since then, the sector has continued to experience significant growth and has made a positive contribution to the national economy. According to data from the Financial Services Authority (OJK) development report for 2014-2023, the growth of Islamic banking in Indonesia shows a stable and positive trend, with BUS still dominating. Meanwhile, UUS and BPRS continue to develop gradually in order to support Islamic financial inclusion.

Meanwhile, considering that the growth of Islamic banking is still lagging behind conventional banking.(Marlina & Diana, 2021). ROA is one of the indicators that must be developed continuously, because less than optimal bank performance will reflect a low level of profitability at the bank.(Fatmawati & Hakim, 2020). With good performance, bank profitability is expected to increase significantly. The graph of the Return On Asset (ROA) Ratio of Islamic banks in Indonesia in 2014-2023 is as follows:





Chart 1. Development of Return on Assets (ROA) of Islamic Commercial Banks in Indonesia for the Period 2014-2023

Source: Processed from data from the Islamic Banking Statistics Report, OJK.

Based on the graph above, Return on Assets (ROA) tended to decline from the beginning of 2014 to 2016, namely from 1.13% to 0.16% in the middle of the year.(2015), This decline indicates the low ability of banks to generate profits from their assets. This could be due to high operational costs, or due to increasing problem financing or due to a lack of efficiency in asset management. Then in 2017 to 2020, ROA gradually experienced a significant increase from 1.01% in 2017 to a peak of around 1.88% at the beginning of 2020. And this increase continued at the beginning of 2021, namely at 2.15%.

However, at the end of 2021, ROA decreased again, which was around 1.55%, this decrease can be attributed to the impact of the Covid-19 pandemic which may have caused an increase in operational costs and also a decrease in income which resulted in a decrease in financing quality. And in 2022 to 2023, ROA showed stabilization although it still fluctuated from 1.98% at the beginning of the year(2022). Then at the beginning of 2023 ROA was in the range of 2.14%, and at the end of 2023 ROA was at 1.88%. This fluctuation shows that ROA has not fully recovered from the pressure of uncertain global economic conditions which are feared to affect the bank's performance. Issah & Antwi(2017)In his research, he also stated that the Return on Asset (ROA) ratio can also influence the measurement of company performance in the future.

Meanwhile, in carrying out its functions and operations, banks also require adequate capital so that their management and business activities can run optimally.(Sari, 2013). The capital owned by a bank must also be sufficient to cover various risks that may arise in its business activities.(Yokoyama & Mahardika, 2019). Capital Adequacy Ratio (CAR) is an indicator of a bank's financial performance which is used to assess the level of capital adequacy in supporting assets that have the potential to cause risk, such as credit that is distributed.(Fahmi, 2014). The Capital Adequacy Ratio (CAR) graph of Islamic banks in Indonesia in 2014-2023 is as follows:





Chart 2. Development of Capital Adequacy Ratio (CAR) of Islamic Commercial Banks in Indonesia for the Period 2014-2023

Source: Processed from data from the Islamic Banking Statistics Report, OJK.

Based on the CAR graph data above, CAR fluctuated in early 2014 at 16.76% and in mid-2015 CAR decreased to 14.09%. Then at the end of 2016, CAR increased to 16.63%. In 2017 to 2019 CAR showed a gradual increasing trend from 16.99% at the beginning of the year to the end of 2017, after which the increase continued in 2018 to 2019 reaching 21.39%. This shows an improvement in the management of the bank's capital ratio.

Then in 2020 to 2023, CAR experienced a significant increase, namely from 21.64% at the end of 2020 to 25.71% at the end of 2021, this increase could be influenced by caution in financial institution policies amid economic uncertainty due to the Covid-19 pandemic. And after experiencing a spike in increase, CAR tends to maintain its stability at 24% to 26% in 2023. This shows the strength of capital conditions in absorbing risk. However, high CAR also indicates excessive caution in financing distribution, therefore it needs to be balanced with optimization in financing distribution to encourage better economic growth.

However, Amidst the rapid development and increasing trend in the indicators above, Islamic banking is also faced with major challenges, especially related to the risk of problematic financing or Non-Performing Financing (NPF). Problematic financing itself appears as one of the bank's business risks due to uncertainty about loan repayment or the debtor's failure to pay off their obligations. (Suwarto & Ali, 2021). The graph of the Non Performing Financing (NPF) Ratio of Islamic banks in Indonesia in 2014-2023 is as follows:



Chart 3. Development of Non Performing Financing (NPF) of Islamic Commercial Banks in Indonesia for the Period 2014-2023

Source: Processed from data from the Islamic Banking Statistics Report, OJK.



Based on data from the Financial Services Authority(2014), NPF was recorded to have experienced a fairly sharp increase from the beginning of 2014 at around 3.01% to reaching its peak around the year(2016)which is in the range of 6.17%. This shows that there is an increase in the risk of problematic financing in the financial system, this can also come from an unstable economic situation or also due to a lack of good credit management. After experiencing an increase, in the year(2017)And(2018)NPF began to decline although it still fluctuated from 4.91% to 3.26% in 2018.

Then, in 2018 to year(2020), NPF tends to experience a gradual decline, namely from 5.21% to 3.13% at the end of 2020. And in 2020(2021)until(2023), the NPF ratio was recorded to have decreased steadily to reach 1.93% in 2023. This downward trend may be influenced by economic improvements after the Covid-19 pandemic and also the implementation of more structured credit policies and success in collecting problematic financing.

From the explanation above, it can be concluded that the high NPF ratio valuecan be an obstacle to the bank's overall financial performance and increase the risk in financing management, This reflects the poor quality of financing management in banks. On the other hand, a low NPF ratio indicates better financing management, so that it can maintain credit quality and also improve bank performance to be more optimal.(Sumarlin, 2016).For this reason, it is crucial that banks are prepared to maintain minimum capital adequacy in order to anticipate risks that arise due to uncontrolled financing growth. (Yokoyama & Mahardika, 2019).

Based on the above phenomenon, it can be drawn from the research hypothesis that there is a downward trend in Non Performing Financing (NPF) followed by an upward trend in Return On Asset (ROA) and Capital Adequacy Ratio (CAR), so there is an assumption that this decrease and increase have a negative effect on these variables. So this study aims to test whether Non Performing Financing (NPF) has a negative effect on Return On Asset (ROA) and Capital Adequacy RoA) and Capital Adequacy Ratio (CAR) of Islamic Banks in Indonesia in the period 2014-2023 as an indicator to measure the performance of Islamic banks.

LITERATURE REVIEW

The Influence of Non Performing Financing (NPF) on Return On Asset (ROA)

Based on literature studies in recent years, the phenomenon of problematic financing or Non Performing Financing (NPF) has become one of the crucial issues and has been widely studied in various Islamic banking literature, considering that various impacts of providing credit or financing contain the risk of default, which can cause losses for banks and risk reducing profitability and also bank stability.(Kasmir, 2014). As the findings reviewed byMessai & Jouini (2013), Makri et al.(2014), Husaini et al.(2021), Marlina & Diana (2021) and Afidah et al.(2024), which states that NPF has a negative influence on ROA. However, in the findings presented by Riyadi & Yulianto(2014), Irawan et al.(2019), Kismawadi et al.(2021), Astuti(2022) and Az-zahra et al.(2023) which states that NPF does not have a significant impact on the ROA variable.

The Influence of Non Performing Financing (NPF) on the Capital Adequacy Ratio (CAR)

According to Fitri & Sriyana(2023), The CAR ratio is used to evaluate the extent to which a bank or financial institution is able to maintain adequate capital to anticipate potential losses, especially those related to credit risk, operational risk and also market risk. In a research conducted by Abusharba et al.(2013), Andhika & Suprayogi(2017)The research results state that NPF has a significant influence on the Capital Adequacy Ratio (CAR). This also has similarities with the findings conducted by Khoirunnisa(2019)and Novitasari et al.(2022)who stated such results. Febrianto & Anggraeni(2016)also stated that if there is an increase in Non Performing Financing (NPF), the Capital Adequacy Ratio (CAR) will also increase, and vice versa if there is a decrease.

RESEARCH METHODS

This study uses a quantitative approach with Time-Series data type, namely by comparing several financial ratios between different periods in one company.(Syamsuddin, 2004). This is to analyze the effect of problematic financing on Return On Asset (ROA) and Capital Adequacy Ratio (CAR) as indicators of Islamic bank performance. The independent variable (X1) in this study is the level of problematic financing (NPF), while the dependent variables include Return on Assets (ROA) as Y1 and Capital Adequacy Ratio (CAR) as Y2. In this study, the data used is Secondary Data, which includes information on Problematic Financing, Return On Asset (ROA) and Capital Adequacy Ratio (CAR) from Islamic banks in Indonesia in the period 2014 to 2023 obtained from official sources of monthly reports of Islamic banks registered with the Financial Services Authority (OJK) and financial data of Islamic financial institutions, as well as the Central Statistics Agency (BPS) for supporting data related to macroeconomic conditions.

This study will use an econometric approach with the Vector Error Correction Model (VECM) model. The Vector Error Correction Model (VECM) technique was chosen in this study because this technique is one of the Publish by Radja Publika



multivariate Time-Series models. Simply put, this technique is used to explain the cointegration relationship between variables that indicate a long-term equilibrium between non-stationary variables in the original data. The presence of cointegration can also be likened to a new opportunity to achieve long-term stability through a linear combination of these variables.(Suharsono et al., 2017).

The analysis process begins with data stationarity testing using the Augmented Dickey-Fuller (ADF) or Phillips-Perron (PP) test to ensure that the data does not contain unstable trends or variances. If the data is not stationary at the level, then a transformation will be carried out using the differencing method. Furthermore, the Johansen cointegration test is carried out to determine whether there is a long-term relationship between variables. If there is cointegration, the VECM model will be used to analyze the long-term and short-term relationships between variables, while if no cointegration is found, the VAR model will be used.

The VECM model is used involving*error correction term (ECT)* to capture long-term relationships, with the following equation:

$$\Delta NPF_{t} = \alpha_{1} + \sum_{\substack{i=1\\p}}^{p} \beta_{11i} \Delta NPF_{t-i} + \sum_{\substack{i=1\\p}}^{p} \beta_{12i} \Delta ROA_{t-i} + \sum_{\substack{i=1\\p}}^{p} \beta_{13i} \Delta CAR_{t-i} + \gamma_{1}ECT_{t-i} + \epsilon_{1t}$$

$$\Delta ROA_{t} = \alpha_{2} + \sum_{\substack{i=1\\p}}^{p} \beta_{21i} \Delta NPF_{t-i} + \sum_{\substack{i=1\\p}}^{p} \beta_{22i} \Delta ROA_{t-i} + \sum_{\substack{i=1\\p}}^{p} \beta_{23i} \Delta CAR_{t-i} + \gamma_{2}ECT_{t-i} + \epsilon_{2t}$$

$$\Delta CAR_{t} = \alpha_{3} + \sum_{\substack{i=1\\p}}^{p} \beta_{31i} \Delta NPF_{t-i} + \sum_{\substack{i=1\\p}}^{p} \beta_{32i} \Delta ROA_{t-i} + \sum_{\substack{i=1\\p}}^{p} \beta_{33i} \Delta CAR_{t-i} + \gamma_{3}ECT_{t-i} + \epsilon_{3t}$$

Where:

- 1. Δ adalah operator diferensi pertama ($\Delta X_t = X_t X_{t-1}$).
- 2. ECT_{t-1} adalah *error correction term* yang mencerminkan deviasi dari hubungan jangka panjang
- 3. γ adalah koefisien ECT yang menunjukkan kecepatan penyesuaian menuju keseimbangan jangka p

Further analysis includes Impulse Response Function (IRF) testing to evaluate how ROA and CAR variables respond to shocks to the NPF variable, as well as Variance Decomposition (VDC) analysis to see the relative contribution of each variable in explaining variation in the model. Data processing will be carried out using statistical software such as Eviews 13. The results of this study are expected to provide insight into the dynamic relationship between non-performing financing, ROA, and CAR, as well as provide strategic input for risk management in the financial sector.

RESULTS AND DISCUSSION Stationarity Test

Based on the results of the root test at the level, it can be seen that the data output in the stationarity test at the level shows that all variables have a prob value > 0.05, meaning that if there are no stationary variables, it is necessary to continue the unit root test at the first difference level.

Table 1. Augmented Dickey Fuller Test						
Variables	Level 1st Difference			Information		
	t-Stat	Prob.	t-Stat	Prob.		
NPF	-0.552989	0.8753	-5.453949	0.0000	Stationary	
ROA	-2.367273	0.1532	-12.37281	0.0000	Stationary	
CAR	-0.499209	0.8864	-10.98740	0.0000	Stationary	

Source: data processed with Eviews 13.2025

Based on the results of the Augmented Dickey Fuller (ADF) test, it is known that all variables, namely NPF, ROA and CAR, are not stationary at the level because the probability value is greater than 0.05. However, after the transformation to the first level of difference (Δ), all variables become stationary with a probability of 0.0000 (less than 0.05), which indicates that the null hypothesis of the existence of a unit root can be rejected at the first difference. For VAR (vector autoregression) analysis, all variables must be stationary. Since the test results show that the new variables become stationary after the first differentiation, the data cannot be directly used in the VAR model with the original levels, but can be used in the form of VAR in the first difference (VAR in differences).



Optimal Lag Test

The selection of optimal lag can be done by looking at the values of Akaike Information Criterion (AIC), Schwarz Criterion (SC), and Hannan-Quinn Criterion (HQ). In general, the optimal lag is determined based on the lag that has the smallest value in one of the three criteria.

Table 2. Optimal Lag Test Results						
Lag	AIC	SC	HQ			
0	-26.20168	-26.12845*	-26.17197*			
1	-26.17821	-25.88528	-26.05938			
2	-26.26310	-25.75048	-26.05515			
3	-26.33023*	-25.59793	-26.03316			
4	-26.26558	-25.31358	-25.69468			
5	-26.17000	-24.99831	-25.69468			
6	-26.15481	-24.76343	-25.59036			
7	-26.14450	-24.53342	-25.49093			
8	-26.05329	-24.22252	-25.31060			

Source: data processed with Eviews 13.2025

Based on the optimal lag test results shown in table 2, it can be seen that lag 3 has the smallest AIC value, namely (-26.33023) which is marked with a (*) sign, lag 0 has the smallest SC value, namely (-26.12845) which is also marked with a (*) sign, then Lag 0 has the smallest HQ value, namely (-26.17197). In VAR/VECM analysis, AIC is generally used more often because it tends to be more flexible in capturing long-term dynamics, while SC and HQ are stricter and tend to choose smaller lags. This is because lag 3 has the smallest AIC value, so lag 3 is chosen as the optimal lag for this model.

Stability Test

The importance of the model stability test lies in its ability to maintain the balance of the relationship between variables in the VAR system, so that it can prevent the occurrence of irregularities or extreme spikes in the long term. Thus, the resulting estimates and forecasts remain reliable and have a clear interpretation meaning.

Table 3. Stability Test Results			
Root	Modulus		
-0.376288 - 0.677244i	0.774760		
-0.376288 + 0.677244i	0.774760		
0.0560031	0.560031		
-0.223724 - 0.436337i	0.490349		
-0.223724 + 0.436337i	0.490349		
0.479968	0.479968		
-0.475133	0.475133		
0.171973 - 0413256i	0.447610		
0.171973 + 0413256i	0.447610		
G 1	1 1 1 1 1 1 2 0		

Source: data processed with Eviews 13.2025

Based on the results of the stability test shown in table 3, as well as the results of the stationary test with the previous 1st difference, it can be concluded that the VAR model in the form of the first difference has met the stability requirements. Previously, the results of the augmented dickey-fuller (ADF) test showed that the NPF, ROA and CAR variables were not stationary at the level, but became stationary after the first differentiation was carried out. Therefore, VAR analysis must be carried out using data in the form of 1st difference to avoid the problem of spurious regression.

Granger Causality Test

The causal relationship between variables is shown by the granger causality test, this is done by looking at the probability (Prob) of each null hypothesis tested. The null hypothesis is rejected if the probability value is less than 0.05, which indicates that there is a one-way or two-way causal relationship between variables.

Table 4. Granger Causality Test



Null Hypothesis:	F-Statistic	Prob.
D(ROA) does not Granger Cause D(NPF)	2.89759	0.0384
D(NPF) does not Granger Cause D(ROA)	1.62854	0.1870
D(CAR) does not Granger Cause D(NPF)	0.48519	0.6933
D(NPF) does not Granger Cause D(CAR)	0.65972	0.5786
D(CAR) does not Granger Cause D(ROA)	2.80544	0.0431
D(ROA) does not Granger Cause D(CAR)	0.86327	0.4626
Source: data processed with Evigue 12 2025		

Source: data processed with Eviews 13.2025

Based on the test results in table 4. First, the causality test between return on assets (ROA) and nonperforming financing (NPF) shows that D(ROA) causes D(NPF) with an F-statistic value of 2.89759 and a probability of 0.0384 (below 0.05), this indicates that the null hypothesis is rejected, which means that ROA has an effect on NPF. However, because D(NPF) does not significantly cause D(ROA) (with a probability of 0.1870 greater than 0.05. This means that changes in non-performing financing (NPF) do not have a significant effect in predicting ROA in the next period.

Then, second, based on the test between Capital Adequacy Ratio (CAR) and non-performing financing (NPF), it shows that there is no causal relationship between D(CAR) and D(NPF) with probability values of 0.6933 and 0.5786 respectively (greater than 0.05, which means that changes in CAR do not cause changes in NPF or vice versa. Third, based on the relationship between CAR and ROA, it is found that D(CAR) causes D(ROA) with a probability of 0.0431 (below 0.05) this indicates that the null hypothesis is rejected, which means that CAR has an effect on ROA. However, the fact that D(ROA) does not cause D(CAR) with a probability value of 0.4626 is greater than 0.05, which means that there is no causal relationship between ROA and CAR.

Cointegration Test

In econometric analysis, the cointegration test is used to determine whether two or more variables in a model have a long-run relationship with each other. If this is the case, the variables will move together in equilibrium in the long run, even though they may diverge in the short run.

Table 5. Results of Johansen's Connegration Test					
Hypothesized		0.05 Critical	Prob.** Critical		
No. Of CE(s)	Trace Statistics	Value	Value		
None *	104.7206	29.79707	0.0000		
At most 1 *	55.20138	15.49471	0.0000		
At most 2 *	24.65393	3.841465	0.0000		

Table 5. Results of Johansen's Cointegration Test

Source: data processed with Eviews 13.2025

Based on Table 5, the test was conducted using Trace statistics, which compares the Trace Statistic value with the Critical Value at a significance level of 5% to determine the number of cointegration relationships in the model. The test results show that in the null hypothesis (None), the Trace Statistic value of 104.7206 is much larger than the Critical Value of 29.79707, with a probability of 0.0000. Because the probability is less than 0.05, the null hypothesis is rejected, which means there is at least one cointegration relationship in the model.

In the At most 1 hypothesis, the Trace Statistic value of 55.20138 is also greater than the Critical Value of 15.49471 with a probability of 0.0000. This indicates that there are at least two significant cointegration relationships. Furthermore, in the At most 2 hypothesis, the Trace Statistic value of 24.65393 is still greater than the critical value of 3.841465, with a fixed probability of 0.0000. This indicates that there are three cointegration relationships in the model.

VECM Estimation

Vector Error Correction Model (VECM) estimation is used to evaluate the relationship between cointegrated variables, both in the short and long term. It can be seen in this study the influence of variables from the long-term equation as seen from the T-Statistic value > T-table, in this case the T-table for the number of data is 120 data and 3 variables with a sign level of 5% (dk = n - k), so dk = 120 - 3 = 117, then the T-table value is 1.980448. \pm

 Table 7. VECM Estimation Results

Long-term



Variables	Coefficient	T-Statistics	Information
D (NPF (-1))	1,000,000	-	-
D (ROA (-1))	11.57265	7.03248	Influential
D (CAR (-1))	-1.551300	-3.79486	No effect

Short-term						
D (ROA,2)		D (CAR,2)				
Variables			Information			Information
	Coefficient	T-Statistics		Coefficient	T-Statistics	
D (NPF (-1),2)	0.097257	1.71286	No effect	0.39605	0.39605	No effect
D (NPF (-2),2)	0.140072	2.22301	Influential	-0.17475	-0.17475	No effect
D (NPF (-3),2)	0.028989	0.53787	No effect	0.73355	0.73355	No effect

Source: data processed with Eviews 13.2025

Based on the exposure of the Z estimation results (VECM) in Table 7. In the long term, these results indicate that ROA has a significant impact with a coefficient value of 11.57265 and T-Statistics of 7.03248. This finding indicates that the level of profitability of Islamic banks plays a role in balancing the financial system. Because the higher the ROA, the better the assessment of the company's financial performance in the long term. In contrast to the CAR variable which does not have a significant effect in the long term, as indicated by its coefficient value of -1.551300 and T-Statistics at -3.799486. This means that the level of capital adequacy does not have a substantial impact on the Islamic banking financial system in the long term.

Meanwhile, in the short term, the relationship between NPF and ROA indicates that the NPF of the previous two periods (NPF(-2)) has a significant effect on ROA, this shows that the impact of problematic financing on the profitability of Islamic banks is only felt after two periods have passed. However, in the previous periods (NPF(-1)) and (NPF(-3)) it did not have a significant impact on ROA, as seen by the low T-Statistics value. In addition, the estimation results also show that NPF has no effect on the CAR variable in the short term. This can also be seen in all observation periods of NPF on CAR as indicated by the relatively low coefficient value and T-Statistics value.

Impulse Response Function (IRF) Test

With the Impulse Response Function (IRF), in this study we can evaluate the extent and how long a shock affects other variables. If a variable can return to its equilibrium condition quickly, then the system is considered stable. Conversely, if the impact of the shock lasts a long time or increases over time, then this indicates a potential imbalance in the economic system being studied and analyzed.



Figure 2. Impulse Response Function (IRF) results

Based on the results of the impulse response function (IRF) displayed in the three graphs above, it illustrates how Non-Performing Financing (NPF) reacts to innovations or shocks from three different variables, NPF itself,

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Source: data processed with Eviews 13.2025

Return on Assets (ROA) and Capital Adequacy Ratio (CAR). The first graph shows how D(NPF) responds to innovations in D(NPF) itself. From this graph, it can be seen that when there is a shock to NPF, the initial response is positive and quite strong, indicating a self-reinforcing effect, where an increase in NPF can trigger further increases in the short term. However, over time this response slowly decreases until it finally returns to equilibrium. This shows that although NPF fluctuates, the impact is not permanent and tends to return to normal within a certain period.

Meanwhile, the second graph shows the response of D(NPF) to innovation in D(ROA). From this graph, it appears that the initial reaction of NPF to ROA shocks is negative, although on a relatively small scale. However, this effect does not last long and soon subsides, indicating that the relationship between profitability and NPF is temporary and does not have a long-term impact. Then, the third graph shows the response of D(NPF) to innovation in D(CAR) contributing to a reduction in NPF in the short term. This is similar to the impact of ROA, the effect of CAR on NPF is also temporary and quickly returns to equilibrium.

Variance Decomposition (VD) Test

Variance Decomposition(VD) helps to understand the extent to which changes in a variable are influenced by itself or other variables in a long-term or short-term system.



Figure 3. Variance Decomposition (VD) Results

Source: data processed with Eviews 13.2025

Based on the results of Variance Decomposition (VD) displayed in the three graphs above, it shows the relative contribution of innovation of each variable to the fluctuation of Non-Performing Financing (NPF). The first graph shows the percentage of variance D(NPF) that comes from innovation in D(NPF) itself. From this graph, it can be seen that changes in almost all variations in D(NPF) are mostly caused by its own internal shocks and are only slightly affected by other variables in the model. While in the second graph, it shows the contribution of innovation in D(ROA) there is a variance of D(NPF). From the results displayed, it can be seen that the influence of ROA on NPF fluctuations is very small, almost approaching zero throughout the analysis period. And in the third graph, it shows that the contribution of innovation in D(CAR) to the variance of D(NPF). The results displayed have a similar pattern to innovation in ROA, where the contribution of CAR to NPF fluctuations is very small and has almost no significant influence in the long term.

The effect of problematic financing on Return On Assets (ROA)

Based on the results of the granger causality test, it indicates that D(NPF) does not cause D(ROA) because the probability is greater than 0.05, so it shows that there is no causal relationship from NPF to ROA. The results of the VECM estimation in the long term show that ROA has a significant impact on NPF, this is in line with the findings of Fitri & Sriyana(2023)and Setia et al.(2023)This is also in accordance with previous research presented by Suwarto & Ali(2021), that the higher the ROA, the better the assessment of the company's financial performance. However, this is in contrast to research conducted by Nasution(2022), which states that the NPF variable has no effect on the ROA variable in the long term.

However, in the short term, the relationship between NPF and ROA indicates that after two periods have passed, it will show a significant influence. This result is in line with several studies conducted byMuhammad et al. (2020),Husaini et al. (2021), and Thufailah(2023), which shows that the Non Performing Financing (NPF) variable has a negative and significant effect on the Return On Asset (ROA) variable. This can be caused by losses arising from problematic financing which can indicate a potential reduction in the amount of profit that should be obtained by the bank.

This is in contrast to the findings made byRiyadi & Yulianto (2014),Darsita (2020),Kismawadi et al. (2021)AndThe Greatest Showman (2022)which states that the Non Performing Financing (NPF) variable does not have a negative and significant effect on the Return On Asset (ROA) variable, which is in accordance with this study in the previous period and the following period which shows that NPF does not have a significant effect on ROA. Publish by Radja Publika



This is also proven in the results of the IRF and VD tests, which indicate that the reaction of ROA shocks to NPF is negative on a relatively small scale and does not last long and is also temporary (in the short term).

The effect of problematic financing on the Capital Adequacy Ratio (CAR)

Based on the results of the Granger Causality test, it shows that there is a one-way causal relationship from ROA to NPF and from CAR to ROA, but there is no causal relationship between NPF and CAR. According to the results of the VECM Estimation test in the long term and short term, although there is an increase in the CAR variable, in this context NPF does not affect the CAR variable in the short term. This can be seen from the coefficient value and the relatively low T-Statistics value in the NPF observation period on CAR. In other words, the capital adequacy of Islamic banks tends to remain stable and is not affected by fluctuations in problematic financing in a shorter period of time.

In the results of the Impulse Response Function (IRF) and Variance Decomposition (VD) tests, capital adequacy (CAR) has a negative impact on Non Performing Financing (NPF), but the effect is relatively smaller, which only lasts in the short term and quickly returns to its equilibrium point. This is in line with the findings made by Nur(2020), which states that in the short term both variables have a negative and significant influence. Meanwhile, in the findings made by Yokoyama & Mahardika(2019), Khoirunnisa(2019) and Novitasari et al.(2022) shows that problematic financing or Non Performing Financing (NPF) has a significant influence on the Capital Adequacy Ratio (CAR) variable.

CONCLUSION

Based on the results of the study using the VECM method, it can be concluded that Non-Performing Financing (NPF) shows a negative effect on Return on Assets (ROA) which is significant in the short term. However, the effect does not last long and tends to return to a balanced condition. On the other hand, the Capital Adequacy Ratio (CAR) variable remains relatively stable and is not directly affected by the increase in Non-Performing Financing (NPF). This shows that the capital of Islamic banks has good resilience in facing the risk of non-performing financing (NPF). The results of this study also emphasize the importance of financing risk management in maintaining the stability and profitability of Islamic banks. For this reason, it is necessary to implement a more optimal risk mitigation strategy, such as tightening credit evaluation before distributing financing and strengthening capital reserves to anticipate the possibility of an increase in NPF. Thus, the results of this study can provide a deeper understanding for banking practitioners, regulators and academics in formulating policies regarding the relationship between NPF, ROA and CAR in the Islamic banking system in Indonesia. In addition, it is also hoped that further research can further examine this research.

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