

# Analysis of the influence of the FDR, NPF ratio moderated by BOPO on the stability of the performance of Indonesian Islamic banks from early 2020-2023

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## Abstract

Islam is a religion that prohibits fraud because in any activity must be in accordance with Islamic law, in the banking world it has also formed Islamic banking which has more advantages than conventional banking but with the Covid outbreak, bank performance has declined in Sharia, and conventionally this is highlighted in the bank's financial ratio. Therefore, this study was conducted with the aim of determining the relationship between Financing To Deposit Ratio (FDR), Non Performing Financing (NPF) and Operational Expenses Operational Opinion (BOPO) as moderating variables on Return on Assets (ROA) in Islamic banking in Indonesia during the Covid-19 pandemic. This study uses quantitative methods and uses secondary data using a sample of 11 Islamic banks for the 2020-2023 period which were selected based on being registered with the OJK and using data processing tools in the form of EVIEWS-12 panel data regression for analysis. It can be seen from the results of the t-test that FDR has an effect on the financial performance of Islamic banking, NPF has a significant negative effect on the dependent variable, the effect of variable X1 on the dependent variable is not significant after being moderated, and variable X2 has a significant negative effect on the dependent variable. seen from the results of this study it is recommended to each Islamic bank to ensure that financial performance must remain stable. with the development of the era that exists, it can encourage helping Islamic banking to be known by some people through technology so that Islamic banking can be easily known by many people

**Keywords:** *FDR, NPF, BOPO, ROA, Sharia, Islamic bank*

## 1. Introduction

In the current era, Islamic banking is growing rapidly in various countries. The existence of Islamic banks varies from place to place. A bank is an institution that collects funds from the public in the form of savings and stores them in the community to be used in the form of loans and others. To improve people's standard of living (Muhammad et al., 2020). In addition to strict regulations based on Islamic law, Islamic finance has attracted global attention in recent decades, especially because of its resilience to the current global crisis. It is surprising that the Islamic financial system is now seen as an alternative to the traditional financial system, with statistics highlighting rapid asset growth and Islamic financial institutions prohibiting interest rate trading (Mennawi, 2020). To improve the realization of social justice, Islamic banks must follow Islamic rules (Darwanto & Chariri, 2019). Therefore, reliance on basic Islamic banking in the financial sector is increasingly trusted and can be considered part of ethical finance (Daoud & Kammoun, 2024).

As stated in a table on the bps.co.id website, Bank Syariah Indonesia (BSI) was able to achieve a net profit of IDR 4.26 trillion in 2022. This figure increased by 40.68% compared to the previous year, which is the highest achievement since BSI was established. The entity currently known as BSI was officially established on February 1, 2021. However, the bank is not a newcomer to the Indonesian banking world. following its merger with other state-owned banking subsidiaries, namely Bank Syariah Mandiri and Bank BNI Syariah. Meanwhile, BSI's profit (formerly BRI Syariah) showed consistent annual growth of around IDR 1 trillion from 2020 to 2022, as shown in the graph. Until the end of 2022, the total assets of the issuer represented by BRIS shares grew 15% (yoy) to IDR 306 trillion. Meanwhile, BSI's third party funds (TPF) grew 12% (yoy) to IDR261.49 trillion. On the other hand, overall financing

grew 21% (yoy) to IDR208 trillion. BSI's gross non-performing financing (NPF) ratio until the end of 2022 was recorded at 2.42%, down from the previous 2.93%. In the same period, net NPF was also recorded to have decreased from 0.87% to 0.57%. Islamic finance has been a phenomenon that has continued to grow in Indonesia for more than two decades. So that with this, it can cause prolonged uncertainty which results in weakening confidence in investment and has implications for business stagnation. So that many Islamic banks experience disruption in carrying out their activities, this also triggers banking ratios such as FDR, NPF, BOPO, and ROA (Wahyuni & Handayani, 2022). This is due to the phenomenon of 2020, namely the outbreak of the Covid-19 pandemic. As a result, restrictions on community movement to stop the spread of infectious diseases will disrupt all sectors of various micro and large businesses (Lisa et al., 2023).

And the COVID-19 outbreak has also disrupted financial indicators and the financial position of all sectors, the most visible of which is the NPF ratio or non-performing loan ratio. Natratsman's research shows that banks with higher NPFs have higher non-performing loan ratios. Become a big bank. Big banks have more opportunities to diversify their loans to reduce NPF (Hosen & Muhari, 2019). Not only NPF, several other indicators such as FDR, BOPO, bank performance and especially ROA also influence this trend. Previous empirical literature shows that NPF has been affected by the COVID-19 pandemic and bank-specific variables are some of the main drivers of bank responses to financial turmoil (Anto & Faaza, 2022).

Therefore, based on several phenomena, the purpose of this study is to analyze the impact of the influence of the financial ratios of FDR, NPF, and BOPO on the performance of Islamic banks (ROA) in 2020 to 2023. Which will later become literature for readers and evaluation of Islamic banks in Indonesia as a whole, later the important findings are paying attention to financial ratios and maintaining several things that are factors so that the performance of Islamic banks in the future will be better.

## **2. Literature Review and Hypothesis Model**

### **Sharia Bank**

In an era of many changes in all aspects, the growth rate of the banking industry in Indonesia is currently experiencing rapid progress. This is true for both conventional and Islamic banks. In the future, the interest of the Indonesian people in using Islamic banking may increase and the role of Islamic banking in supporting the stability of the national financial system will become increasingly important. (Online et al., 2021). A crucial aspect is the indicator that can be used to assess the financial performance of Islamic banks, namely their profitability which is measured by the return on assets (ROA). A high ROA ratio reflects efficiency in asset management, or in other words, management efficiency. The higher this ratio, the higher the efficiency. (Iqbal & Anwar, 2022). Based on the existing definition, it can be concluded that a general Islamic bank is a financial institution that provides payment services. In its operational activities, Islamic banks implement a profit-sharing system and other forms of compensation in accordance with Islamic sharia law. The existence of Islamic banks offers an alternative for Muslims to carry out transactions that are in line with Islamic law without involving an interest system that is prohibited by religion. This support is further strengthened by the existing growth, which shows that this factor is not only due to high resilience to crises, but also because the financial sector has continued to grow over the past few decades, supported by technological advances, especially in the field of Islamic banking, which offers great profit potential with a wide market. (Trianto, 2018).

In addition, other sources explain the definition of Islamic banking. According to the current law, Islamic banking includes everything related to Islamic operations and entities, such as organizations, business operations, methods and procedures in carrying out operations. (Ali et al., 2023). Considering the rapid development in the banking sector, there are other factors that we must pay attention to. In other words, the understanding of sharia in Indonesia is still considered inadequate, reaching only 8.93%. Thus, cooperation from all parties is needed to improve understanding of Islamic financial literacy and ensure that the public obtains the right information about Islamic banking products and services. (Nugroho, 2022).

## Sharia Bank Performance

The report indicated that the banking sector experienced a decline in 2020 due to the impact of the pandemic, and banks have been asked to provide support to debtors. Credit risk experienced a fairly high level in the previous year. One of the elements that is often used as an instrument to assess a company's financial performance is financial ratios. The factor that is usually used as a tool to measure a bank's financial performance is the financial ratio. Islamic banks or almost all banks (both Islamic and conventional banks) must have what are called indicators, tools or factors that support the performance of banking activities. Previous research shows that this index is intended to measure the level of management efficiency in carrying out banking activities and identifying errors, and banks use this index to find out financial problems (Rokhimah et al., 2024). However, the smoothness of a bank in running its operations does not only depend on its indicators, there must be good asset growth in the banking sector or other sectors. Start learning about the Halal industry, including fashion, cosmetics, cooking, and Halal tourism (Permana, 2023). Due to these various factors, an evaluation of the operational performance of Islamic banking needs to be carried out by all internal and external stakeholders, including the government and other stakeholders who play an important role in improving the operational performance of Islamic banking, assuming that there is (Sholahuddin & Purwaningtyas, 2018).

## Islamic Bank Financial Ratio

Financial ratios are analytical tools used to identify and explain the relationship between elements of financial statements with other financial statements. There are four types of financial ratios, namely liquidity ratios, activity ratios, solvency ratios, and profitability ratios. To measure financial performance, you can use one of the ratios, namely profit margin. Profit margin is used to determine the company's ability to generate profits and measure the efficiency of its management. Return on Assets (ROA) is used as a financial indicator in this study. Islamic banks or most banks certainly have ratios that are cited in previous studies. It is determined that this ratio is intended to measure the level of management efficiency in carrying out its operational activities (Hamdani et al., 2018) From several ratios, it is clear that the profitability aspect is the profit obtained by each banking company, and profitability can be increased (Online et al., 2021)

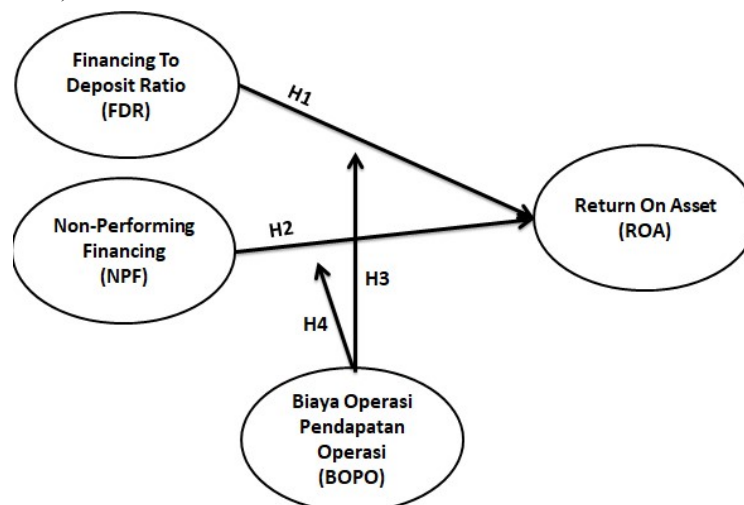


Figure 1. Conceptual model

### •The effect of Financing To Deposit Ratio (FDR) on Return On Assets (ROA)

Funding to Deposit Ratio (FDR) is a ratio used to measure and see the composition of the amount of credit disbursed compared to the amount of public money and equity used. In a study conducted by Nofi Damayanti and Wuryaningsih Dwi Lestari (2022), the t-test statistics accepted the results of the hypothesis analysis that the FDR ratio had a negative and insignificant effect on the ROA of Muslim banking goods in Indonesia. This is different from the study conducted by Danik Setiarini and Fetria Eka Yudiana which stated that the FDR variable had a positive and insignificant effect on the ROA of Islamic banks in Indonesia.

**H1:** Financing to Deposit Ratio (FDR) has a positive but insignificant effect on Return on Assets (ROA)

● **The Influence of Non-Performing Financing (NPF) on Return On Assets (ROA)**

NPF is one of the indicators of the financial health of a financial institution. High NPF indicates a credit management problem and can have a negative impact on the financial performance of the organization. In a study conducted by Muhammad Iqbal and Saiful Anwar (2022), it was assumed that the influence of the analysis results showed that NPF had a negative impact on ROA in Indonesian Islamic banks. However, this is different from the study conducted by Zulaika Putri Rokhimah, Novitasari Eviyanti, Aditya Rizqi Senoaji (2024) which stated that the NPF variable has a positive influence on ROA of Islamic banks in Indonesia.

**H2:** Non-Performing Financing (NPF) has a positive effect on Return On Assets (ROA)

● **The influence of Financing To Deposit Ratio (FDR) on Return On Assets (ROA) is moderated by Operating Costs Operating Income (BOPO)**

operating relative to operating income. The smaller this ratio the better because the bank in question can cover its operating costs with operating profit, thereby increasing the profit to be achieved. BOPO is used to measure efficiency and ability in running banking operations. In a study conducted by Laylan Syafina, it was shown that the BOPO variable can moderate the FDR variable against ROA in the Islamic banking sector.

**H3:** Financing To Deposit Ratio (FDR) has a positive effect on Return On Assets (ROA) moderated by Operating Costs Operating Income (BOPO)

● **The effect of Non-Performing Financing (NPF) on Return On Assets (ROA) is moderated by Operating Costs Operating Income (BOPO)**

Previously explained about non-performing financing, this ratio shows the ability of bank management in managing non-performing financing provided by the bank. This means that the higher this ratio, the worse the quality of bank financing which causes the amount of non-performing financing to increase. The possibility of a bank in a problematic condition is greater where the losses incurred due to the poor level of financing returns. In the same study by Laylan Syafina who said that from the results of her analysis, the non-performing financing variable had a negative effect on return on assets which was moderated by operating costs on operating income.

**H4:** Non-Performing Financing (NPF) has a negative effect on Return On Assets (ROA) moderated by Operating Costs Operating Income (BOPO)

### **3. Methodology**

In this study, the researcher used a quantitative research method. The data used in this study are secondary data in the form of annual financial reports of Islamic banks in Indonesia registered with the OJK for the period 2020-2023. Data can be taken from the annual report website of each Islamic bank. The research data used in this study is panel data. This data was obtained through calculations for one year. The population or sample in this study consisted of 11 Islamic banks in Indonesia registered with the OJK. The sample selection criteria were chosen by the researcher because: 1) Banks registered with the Financial Services Authority (OJK) during the 2020-2023 research period, 2) Data Distribution Analysis The sample used in this study is MRA (Moderated Regression Analysis). MRA is a valuable tool for researchers who want to understand the complex relationships between variables. The purpose of using MRA is to help researchers better understand the phenomena they observe, obtain more theoretically and practically relevant information, and make the results easier to understand by a wider audience. It's not just about MRA (Moderated Regression Analysis). The test used in this study involves both methods, namely classical hypothesis testing and data processing using Eviews-12 as an analysis tool. Eviews 12 is a very flexible and powerful tool for quantitative data analysis. Eviews 12 has become a popular choice among researchers and practitioners because of its user-friendly interface, various analysis features, and the ability to handle various types of data. And

also to test the tests used to determine the impact of the variables used. in this section. Learning is very important to gain the knowledge and skills needed in life.

**Table 1. Research Sample**

No	Code	Name Of Bank	Official Year
1	451	BANK SYARIAH INDONESIA	2021 -Until Now
2	147	BANK MUAMALAT	1994 - Until Now
3	506	BANK MEGA SYARIAH	2008 - Until Now
4	947	BANK ALADIN SYARIAH	1994 - Until Now
5	405	BANK VICTORIA SYARIAH	1996 - Until Now
6	425	BANK JABAR BANTEN(BJB)	2010 - Until Now
7	517	BANK PANIN DUBAI SYARIAH	2009 - Until Now
8	521	BANK KB BUKOPIN SYARIAH	1990 - Until Now
9	536	BANK BCA SYARIAH	2010 - Until Now
10	213	BANK TABUNGAN PENSUN NASIONAL SYARIAH (BTPN)	2014 - Until Now
11	116	BANK ACEH SYARIAH	1973 - Until Now

**Table 2. Variable Measurement**

Variabel	Definition	Indicator
Financing To Deposit Ratio	The Financing to Deposit Ratio (FDR) is a tool used to assess payments due from banks. This ratio is a measurement tool used to see the bank's ability to attract third-party funds (DPK) from Islamic banks as a source of liquidity.	$FDR = \frac{\text{total third financing party funds}}{\text{total}} \times 100\%$

Non-Performing Financing

$$\text{NPF} = \frac{\text{troubled total financing}}{\text{total financing}} \times 100\%$$

Operating Cost Of Operating Income

Non Performing Financing (NPF) is a financial ratio that measures the ability of bank management to manage the long-term financing provided by the bank as a proportion of its total financing. The higher the NPF, the lower the ROA.

$$\text{BOPO} = \frac{\text{operating expenses}}{\text{operating income}} \times 100\%$$

The BOPO ratio is a comparison between operating expenses and operating income to measure the level of efficiency and ability of banks to carry out their operations. The lower the BOPO ratio, the better, as the bank is able to cover operating expenses with operating income.

Return On Assets

The profitability ratio is a measure of the company's ability to make a profit. The existence of information related to profitability is usually used by investors to assess the possibility of investment and its risks, so profitability is also useful for bondholders to assess credit decisions, in addition to being used by shareholders. The profitability ratio is the ability of the company to generate a certain amount of profit in relation to total assets, sales and equity. Profitability is measured by the company's average return on assets (ROA).

$$\text{ROA} = \frac{\text{Total net profit}}{\text{Total Assets}} \times 100\%$$

## 1. Result And Discussions Result

The findings of this study were obtained using the EVIEWS-12 testing tool, taking a sample of 11 Islamic banks in Indonesia, and using Moderate Regression Analysis (MRA) testing, classical assumption testing, and hypothesis testing. Below are the test results using the eewes 12 tool. Panel data regression is used in the study to help researchers find the truth of the results. This can be done using three analytical models: the common effects model (CEM), the fixed effects model (FEM), and the mixed effects model (REM). The calculation results are attached below.

### Chow Test

The Chow test or Chow test is used to determine the best approach in estimating panel data for a suitable study between the common effect model (CEM) and fixed effect model (FEM) approaches. Below are the Chow results using the Eviews-12 test tool:

Table 3. Chow Test Results

Effects Test	Statistic	d.f.	Prob.
Cross-section F	10.443625	(10,30)	0.0000
Cross-section Chi-square	65.995280	10	0.0000

Source: Data Processing Results Using Eviews 12

Based on Table 3 above, the chi-square cross-section probability value is 0.0000, where 0.0000 means less than ( $<$ ) 0.05. Therefore, the model that should be used in this study is the fixed effect model (FEM). Because the selected model is the fixed effect model (FEM), additional testing is needed. The Hausman test was conducted to determine the superior model between the fixed effect model (FEM) and the mixed effect model (REM) applied in this study.

### Hausman Test

The Hausman test is used to determine the best approach that is suitable for panel data estimation between the fixed effect model (FEM) and mixed effect model (REM) approaches. The following are the results of the Hausman test:

Table 4. Hausman Test Results

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	5.418048	3	0.1436

Source: Data Processing Results Using Eviews 12

From the data listed in Table 4, it can be seen that the test of the difference between the fixed effect model (FEM) and the random effect model (REM) produces a random cross-sectional probability of  $0.1436 > 0.05$ . Therefore, the recommended model for use in this study is the random effect model (REM). Because the selected model is the Random Effects Model (REM), further testing is needed, especially the Lagrange multiplier test to understand the Common Effects Model (CEM) or Random Effects Model (REM) test.

### Lagrange Multiplier Test

The Lagrangian multiplier (LM) test is used in panel data analysis to compare whether a random effects model is better than a pooled ordinary least squares (OLS) model. This test helps determine whether there are specific individual differences between cross-sectional units. The following are the results of the Lagrangian multiplier (LM) test:

Table 5. Lagrange Multiplier Test Results

	Cross-section	Test Hypothesis	
		Time	Both
Breusch-Pagan	24.41504 (0.0000)	1.253957 (0.2628)	25.66899 (0.0000)
Honda	4.941157 (0.0000)	- 1.119802 (0.8686)	2.702106 (0.0034)
King-Wu	4.941157 (0.0000)	- 1.119802 (0.8686)	1.391524 (0.0820)
Standardized Honda	5.769119	- 0.891021	0.296270

	(0.0000)	(0.8135) (0.3835)
Standardized		-
King-Wu	5.769119 (0.0000)	0.891021-0.871738 (0.8135) (0.8083)
Gourieroux, et al.	--	-- 24.41504 (0.0000)

Source: Data Processing Results Using Eviews 12

From Table 5 above, it can be seen that the Lagrangian multiplier test produces a Berouche-Pagan probability value of 0.0000. Because  $<0.05$ , it can be said that  $H_0$  is rejected and  $H_a$  is accepted, so the model chosen between the common effect model (CEM) and the random effect model (REM) is the random effect model (REM) because it has a probability value of  $<0.05$ .

### Multicollinearity Test

Multicollinearity testing is used to test whether there is a correlation between independent variables in a regression model. The occurrence of multicollinearity can be detected if the correlation coefficient of each independent variable is greater than 0.8. The results of the multicollinearity test are shown in the table below.

Table 6. Multicollinearity Test Results

	X1	X2	Z
X1	1.000000	0.319891	0.055987
X2	0.319891	1.000000	0.011288
Z	0.055987	0.011288	1.000000

Source: Data Processing Results Using Eviews 12

Referring to table 6 that has been presented, it appears that in the multicollinearity test displayed, each independent variable applied in this study does not show a value exceeding 0.8. In other words, it can be stated that each independent variable used does not experience multicollinearity problems.

### Moderated Regression Analysis (MRA) Test

This study implements moderated regression analysis (MRA) with the aim of exploring the impact of loan to deposit ratio (FDR) and non-performing loans (NPF) variables on the profitability of financial performance as measured by ROA. Here, operating costs and operating profits (BOPO) are used as variables to adjust the operations of Islamic banks registered with the OJK during the period 2020-2023.

### Results of the Moderated Regression Analysis (MRA) Test before moderation

Table 7. Results of the Moderated Regression Analysis (MRA) Test before moderation

Variabl e	Coefficient	Std. Error	t-Statistic	Prob.
C	3.398935	1.138967	2.984227	0.0048
X1	0.002695	0.009958	0.270604	0.7881

X2	-0.624270	0.32405 -	0.061
		5	1.9264330

Effects Specification

Source: Data Processing Results Using Eviews 12

Based on the Estimation Equation:

Example question:  $C(1) + C(2)*X1 + C(3)*X2 + [CX=R]$

Substitution Coefficient:

$Y \text{ value} = 3.39893539327 + 0.00269465973527 X1 - 0.624269888807 X2 + [CX=R]$  So the interpretation in table 7 is as follows:

Constant (C): The coefficient of 3.398935 shows that when the values of X1 and X2 are set at 0, then Y has a value of 3.398935. This constant has a very significant value with a p-value of 0.0048 (below 0.05), indicating that this effect is statistically significant.

The X1 coefficient of 0.002695 indicates that every one-unit increase in X1 will cause Y to increase by 0.002695 units. However, this figure is not statistically significant because the p-value of 0.7841 is far greater than 0.05, indicating that the X1 variable does not have a significant effect on Y.

The X2 coefficient of  $|-0.624269|$  indicates that every unit increase will have an impact. This value almost reaches the level of significance considered relevant at 10%, because the p-value obtained is 0.0610, which is slightly higher than 0.05. Based on this, it can be concluded that X2 may have an effect on Y, but the effect is not significant.

**Results of the Moderated Regression Analysis (MRA) Test after moderation**

Table 8. Results of the Moderated Regression Analysis (MRA) Test after moderation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	1.556265	1.046601	1.486971	0.1449
X1	-0.000431	0.008096	-0.053258	0.9578
X2	-0.511660	0.267467	-1.912987	0.0629
Z	0.018476	0.004119	4.485812	0.0001

Effects Specification

Source: Data Processing Results Using Eviews 12

Estimation Equation:

$Y = C(1) + C(2)*X1 + C(3)*X2 + C(4)*Z + [CX=R]$

Substitution Coefficient:

$Y = 1.55626549553 - 0.000431191865206*X1 - 0.511660447543*X2 + 0.0184764890589*Z + [CX=R]$

Then it can be interpreted in table 8 as follows:

C (constant): The number 1.556265 reflects the average value of Y when all independent variables and their interactions are zero. However, a direct understanding of constants is often not so relevant in regression analysis.

X1: A coefficient of  $|-0.000431|$  indicates that every increase in X1 will result in a decrease in the value of Y by 0.000431 units, provided that the other variables remain constant. However, considering the very large p-value (0.9578), the impact of X1 on Y is not statistically significant.

The coefficient of X2 of  $|-0.511660|$  indicates that every increase in X2 will result in a decrease in the value of Y by 0.511660 units, assuming the other variables remain unchanged. The relatively low p-value (0.0629) indicates that the effect of X2 on Y may be significant, although not very strong.

The coefficient of Z of 0.018476 indicates that every increase in Z will result in an increase in the value of Y by 0.018476 units, provided that the other variables remain unchanged. A very low p-value (0.0001) indicates that the impact of Z on Y has high statistical significance.

**T test**

**T test before moderated**

Table 9. T-Test Results Before Moderation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	2.098522	1.231962	1.703398	0.0961
X1	0.021913	0.014889	1.471795	0.1487
X2	-0.834472	0.349631	-2.386722	0.0217

Source: Data Processing Results Using Eviews 12

Based on table 9, it can be seen that the t-test results can be interpreted as follows:

Constant (C): The constant value of 2.098522 reflects the average of the dependent variable when all independent variables have a value of zero. However, a direct understanding of the constant is often not very appropriate in the context of regression analysis.

Variable X1: The coefficient with a value of 0.021913 and a p-value of 0.1487 indicate that the impact of variable X1 on the dependent variable is not statistically significant at the 5% significance level. This means that there is insufficient evidence to support the claim that a one-unit change in X1 will result in a significant change in the dependent variable.

Variable X2 has a coefficient of  $|-0.834472|$  and a p-value of 0.0217, indicating that the effect of X2 on the dependent variable is statistically significant at the 5% significance level. This means that there is sufficient evidence to indicate that a one-unit change in X2 will result in a significant decrease in the dependent variable.

**T test after moderated**

Table 10. Results of the T-test after moderation

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.097475	1.212763	0.0803740	0.9363
X1	0.019280	0.013085	1.4735130	0.1484
X2	-0.826655	0.306799	-2.6944520	0.0103
Z	0.020804	0.005715	3.6400200	0.0008

Source: Data Processing Results Using Eviews 12

Based on table 10, it can be seen that the t-test results can be interpreted as follows:

- Constant (C): The constant number of 0.097475 reflects the average value of the dependent variable when all independent and moderator variables are at zero. However, direct interpretation of the constant is often not very relevant in the context of regression analysis.

Variable X1 has a coefficient of 0.019280 with a p-value of 0.1484, which indicates that the impact of variable X1 on the dependent variable is not statistically significant at the 5% significance level. This indicates that there is not enough data to conclude that a one-unit change in X1 will result in a significant change in the dependent variable, after considering the influence of the moderator variable (Z).

Variable X2: The coefficient of  $|-0.826655|$  and the p-value of 0.0103 indicate that the influence of variable X2 on the dependent variable is statistically significant at the 5% significance level. This shows that there is sufficient evidence to indicate that a one-unit change in X2 will result in a significant decrease in the dependent variable, after considering the impact of the moderator variable (Z).

- Variable Z (Moderator): The coefficient reaching 0.020804 and the p-value of 0.0008 indicate that the influence of variable Z as a moderator has high statistical significance. In other words, variable Z plays an important role in influencing the relationship between the independent variables (X1 and X2) and the dependent variable.

#### **F Test F Test before moderation**

Table 11. F-test results before moderation

F-statistic	3.127665
Prob(F-statistic)	0.054429

Source: Data Processing Results Using Eviews 12

In table 11 the F statistic value is recorded at 3.127665, while the p value is 0.054429. Since the p value exceeds 0.05 (which is a common level of significance), the regression model before moderation does not show statistical significance. This indicates that the independent variables collectively do not have sufficient value to describe the differences in the dependent variable.

#### **F-test after moderation**

Table 12. Results of the F Test after moderation

F-statistic	7.124670
Prob(F-statistic)	0.000605

Source: Data Processing Results Using Eviews 12

In the table 12 the F statistic value increased to 7.124670 with a p value reaching 0.000605. Because the p value is much lower than 0.05, the moderated regression model shows statistical significance. This shows that the addition of moderator variables can improve the quality of the regression model in explaining the differences in dependent variables..

#### **R2 (R-Squared) Test (Coefficient of Determination) R2 (R-Squared) Test (Coefficient of Determination) before moderation**

Table 13. Results of the R2 Test (Coefficient of Determination) before moderation

R-squared	0.132373
Adjusted R-squared	0.090050

Source: Data Processing Results Using Eviews 12

In the table 13 the R-squared coefficient is recorded at 0.132373, while the Adjusted R-squared value is 0.090050. This indicates that only about 13.23% of the variation of the dependent variable can be described by the model used. Before moderation. A lower adjusted R-squared value indicates overfitting, which is when the model is too complex.

### **R2 (R-Squared) Test (Coefficient of Determination) after moderation**

Table 14. Result of the R2 Test (Coefficient of Determination) after moderation

R-squared	0.348258
Adjusted R-squared	0.299378

Source: Data Processing Results Using Eviews 12

In the table 14, the R-squared value shows an increase to 0.348258, while the adjusted R-squared value changes to 0.299378. This indicates that about 34.83% of the differences in the dependent variable can be revealed by the model after moderation. This increase in the R-squared value indicates that the addition of moderator variables has improved the model's ability to explain data variation.

### **Discussion**

#### **The effect of Financing To Deposit Ratio (FDR) on Return On Assets (ROA)**

Based on the results of the T-test, the next step is to conduct an analysis to evaluate the hypothesis (H1) regarding ROA (Y). This is also reflected in Table 9, where the coefficient reaches 0.021913 and the p-value is 0.1487. This shows that the X1 variable does not have a significant effect on the dependent variable. Thus, FDR can be said to have an impact on financial performance and profitability in the Islamic banking system. Showing a coefficient of 0.021913, which shows that individually, FDR has a significant negative effect on ROA in general Islamic banks. This problem can be described as if FDR is progressing. This will have an impact on increasing ROA and vice versa. On the other hand, the impact on the variables analyzed is not striking enough to be statistically identified in the model. This does not mean that FDR has no meaning, but in certain situations or research contexts, this variable may not have a direct and clear effect.

#### **The effect of Non-Performing Financing (NPF) on Return On Assets (ROA)**

Based on the results of the T-test conducted to evaluate the hypothesis (H2) regarding ROA(Y), it can be seen in Table 9 that the NPF variable has a significant and negative influence. The dependent variables analyzed are the financial performance of Islamic banks and the financial profitability of Islamic banks, which show a coefficient value of -0.834472 with a p-value of 0.0217. This indicates that the X2 variable has a statistically significant influence on the dependent variable. The significant negative influence of NPF reflects the high level of financial problems that have a negative impact on the performance and stability of financial institutions. Thus, banks need to prioritize credit risk management and ensure that capital is channeled to debtors who have good solvency, in order to maintain a low NPF level.

#### **The effect of Financing To Deposit Ratio (FDR) on Return On Assets (ROA) is moderated by Operating Costs and Operating Income (BOPO)**

Based on the t-test in Table 10 above, it is known that the variables listed are moderated by the moderator variable which shows a coefficient of 0.019280 and a p-value of 0.1484 which indicates that the effect of variable X1 on the dependent variable is not statistically significant at the 5% significance level. This means that there is not enough evidence to state that a one-unit change in X1 will cause a significant change in the dependent variable, after taking into account the effect of the moderator variable (Z). and the results of the post-censored moderator regression analysis (MRA) test show that the coefficient value is significant for variable Y. Although not significant, the coefficient value of the moderator variable (Z) of 0.018476 shows that every one-unit increase in Z increases the value of Y by 0.018476 units, assuming other variables remain constant. A very small p-value (0.0001) indicates that the effect of Z on Y is very statistically significant. Which means that Bopo moderation can moderate variable X1 on variable Y

## **The effect of Non-Performing Financing (NPF) on Return On Assets (ROA) is moderated by Operating Costs and Operating Income (BOPO)**

Based on the results of the t-test in Table 12 above, it is known that the variables listed are moderated by the moderator variable showing a coefficient value of -0.826655 and a p-value of 0.0103 indicating that the influence of the variable means X2 has a significant marginal influence at the 10% significance level but not at the 5% significance level. The negative coefficient indicates that an increase in X2 will slightly decrease the dependent variable. Although it has a significant negative influence, the coefficient of the moderator variable (Z) has a value of 0.018476 which indicates that each increase in Z by one unit will increase the value of Y by 0.018476 units, assuming other variables remain constant. A very small p-value (0.0001) indicates that the influence of Z on Y is very statistically significant. Which means that Bopo moderation can moderate variable X1 on variable Y.

### **5. Conclusion and Suggestions**

Islamic Commercial Bank is a financial institution that provides payment services. In its operational activities, Islamic banks implement a profit-sharing system and other forms of compensation in accordance with Islamic sharia law. The existence of Islamic banks provides an alternative for Muslims to conduct transactions in accordance with Islamic law without involving the interest rate system which is prohibited by religion. Islamic banks or almost all banks (Islamic banks and conventional banks) must have what are called indicators, tools or factors that support banking performance. Previous research shows that this index is intended to measure the level of management efficiency in carrying out activities. Financial ratios are analytical tools used to identify and explain the relationship between elements of financial statements and other financial statements. There are four types of financial ratios, namely liquidity ratios, activity ratios, solvency ratios, and profitability ratios. To measure financial performance, you can use one of the ratios, namely profit margin. Profit margin is used to determine the company's ability to generate profits and measure the efficiency of its management. Return on assets (ROA). Not only ROA but also other variables such as FDR, NPF and BOPO. Based on the results of the study using the moderation test, it was found that FDR had no significant effect on the return on assets (ROA) of Islamic banks, both before and after the regulation of operating costs and operating income (BOPO). This means that in the context of this study, changes in FDR do not have a significant effect on the profitability of Islamic banks during 2020-2023. And PF has a significant negative effect on ROA, which shows that an increase in NPF can reduce the profitability of Islamic banks. This is in line with the assumption that the high amount of problematic funding can disrupt financial performance and banking stability. Therefore, Islamic banks in Indonesia need to focus more on managing problematic financial risks (NPF) and operational efficiency (BOPO) to maintain stable and optimal financial performance, especially before the economic impact of the pandemic.

#### **1. Suggestion for company**

##### **• Credit risk management:**

The results of the study show that non-performing financing (NPF) has a significant negative effect on return on assets (ROA). This shows that high MFN can reduce the profitability of Islamic banks. Therefore, Islamic banks are advised to improve credit risk management, including tightening the assessment of the suitability of loan applicants and implementing more prudent credit policies. Tighter monitoring of the financial portfolio is needed to minimize financial problems that may arise.

##### **• Improving operational efficiency through Bopo:**

The BOPO variable (operating costs per operating profit) plays an important role as a moderating factor that can increase the influence of other variables on ROA. The lower the BOPO ratio, the higher the bank's profitability. Islamic banks must emphasize efficiency in their operations to ensure that operating costs remain lower than income. One way to achieve this is to maximize the use of technology to reduce operating costs and improve process efficiency.

- **Improve communication and product understanding:**

Although the Funding to Deposit Ratio (FDR) did not show a significant impact on Return on Assets (ROA) in this study, it is important for Islamic banks to continue to innovate and introduce competitive products. . By increasing the dissemination of information about Islamic banking products, banks can attract more customers, including using digital platforms to reach a larger group.

- **Digital technology innovation:**

This study notes that the use of technology can help Islamic banks expand their social reach and improve operational efficiency. Islamic banks should expand digital services and easy-to-use banking applications to increase accessibility for customers. This is part of the rapidly growing digitalization trend.

- **Improve the quality of human resources in the field of risk management.**

Considering that NPF has a major impact on profitability, Islamic banks need to improve the capacity of human resources in risk management and financial management. Training and capacity building related to risk assessment and management of problematic finances can be considered as important steps in maintaining the financial stability of Islamic banks.

## 2. Suggestion for future researchers

For future research, it is recommended that sampling cover various aspects that are to be included in the study, because diversity can provide opportunities and produce more detailed answers. This approach is designed to increase generalization and variation in research. so that the accuracy and authenticity of the data collected can be utilized and relied on. In addition, exploration and combination of various additional variables can also be carried out, not only limited to credit variables and problematic costs. There are many other variables, such as income and other variables that have a wider scope, which can be used as a focus in future research. The results of this study are expected to be an important source of information, because without this study, we will not know the challenges faced in the era of Islamic banking.

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