

## **Effect of Performing Loan, Intermediation Function, and Operational Efficiency on Banking Profitability (Case Study at PT Bank Pembangunan Daerah Jawa Barat & Banten, Tbk Period 2014–2024)**

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| <b>Keywords:</b>                                                                                                          | <b>Abstract</b>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
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| Non-Performing Loan; Loan to Deposit Ratio; Operating Expenses to Operating Income; Return on Assets; Bank Profitability. | Banks' profitability reflects their ability to perform financial intermediation, manage credit risk, and control operating costs. Bank bjb's return on assets (ROA) declined during the 2014–2024 period, highlighting the need to identify its key financial determinants. This study aimed to examine the effects of non-performing loans (NPL), loan-to-deposit ratio (LDR), and operating expenses to operating income (BOPO) on return on assets (ROA). A quantitative descriptive and explanatory research design was employed using 44 quarterly observations derived from Bank bjb's financial statements and annual reports, along with official publications from the Indonesia Stock Exchange and the Financial Services Authority. Saturated sampling was applied, and the data were analyzed using SPSS through descriptive statistics, classical assumption tests, multiple linear regression analysis, correlation analysis, coefficient of determination analysis, and hypothesis testing. The findings showed that NPL, LDR, and BOPO simultaneously had a significant effect on ROA ( $F = 5.186$ ; $p = 0.004$ ). Partially, NPL had a significant negative effect on ROA ( $\beta = -0.155$ ; $p = 0.034$ ), whereas LDR had a significant positive effect on ROA ( $\beta = 0.013$ ; $p = 0.030$ ). BOPO had a negative but statistically insignificant effect on ROA ( $\beta = -0.011$ ; $p = 0.296$ ). The model explained 22.6% of the variation in ROA. Therefore, profitability was strongly influenced by effective credit risk management and an optimal intermediation function, supported by continuous efficiency improvements and revenue diversification strategies. |

### **INTRODUCTION**

Banks play a strategic role in supporting national economic growth as financial intermediary institutions that collect funds from surplus units and channel them to deficit units. From a macroeconomic perspective, banks support monetary policy through the management of money supply, while from a microeconomic perspective, banks serve as the primary source of financing for business activities and public consumption (Kasmir, 2016). Banking activities in Indonesia are regulated under Law No. 7 of 1992 concerning Banking, which was amended by Law No. 10 of 1998. These regulations emphasize that banks function to collect public funds and redistribute them in the form of credit to improve public welfare (Sutrisno, 2016). Through this function, fund collection and lending activities become core banking operations that significantly influence banks' ability to generate profits because Third-Party Funds (DPK) represent the primary source of financing that contributes to interest income as a major component of bank profitability (Suwandi & Oetomo, 2017).

One type of bank that performs the financial intermediation function is the Regional Development Bank, which was established based on Law No. 13 of 1962 to support regional development financing. PT Bank Pembangunan Daerah Jawa Barat dan Banten Tbk (Bank bjb) is the largest Regional Development Bank in Indonesia, one of the three Regional Development Banks listed on the Indonesia Stock Exchange, and the only one to receive a “Double A” rating from Pefindo (Sudarmawanti & Pramono, 2017). Therefore, its strategic role in supporting the economies of West Java and Banten is significant (Setyarini, 2020). However, Bank bjb’s profitability, measured by Return on Assets (ROA), demonstrated a declining trend during the 2014–2024 period. ROA increased from 1.94% in 2014 to a peak of 2.22% in 2016; however, it subsequently declined and reached its lowest level of 0.86% in 2024. This condition reflected a decrease in the bank’s efficiency in utilizing assets to generate net income (Prayoga et al., 2022).

The decline in profitability was generally associated with three main indicators: credit quality, reflected by the Non-Performing Loan (NPL) ratio; the effectiveness of the intermediation function, reflected by the Loan-to-Deposit Ratio (LDR); and operational efficiency, reflected by the ratio of Operating Expenses to Operating Income (BOPO) (Alfian & Pratiwi, 2021; Dewi, 2018). During the observation period, these three indicators at Bank bjb showed fluctuating movements, including an increase in NPL in 2024, a decline in LDR during the COVID-19 pandemic in 2020, and an increase in BOPO to its highest level in 2024 (Silvia & Salma, 2021). These changes occurred simultaneously with the weakening of ROA during the same period (Septiani & Lestari, 2016).

Previous studies have generally found that NPL and BOPO have negative effects on ROA, although some studies have reported different or insignificant results. The effect of LDR on ROA has shown more varied findings, with some studies identifying a negative relationship and others reporting a positive relationship. Therefore, the direction and magnitude of LDR’s effect may depend on bank characteristics and underlying macroeconomic conditions (Peling & Sedana, 2018). The inconsistency of previous findings, combined with the decade-long declining trend of Bank bjb’s ROA, highlighted the need for further research focusing specifically on Bank bjb over an extended observation period to capture financial performance dynamics across various economic conditions, including the impact of the COVID-19 pandemic (Sadi’yah et al., 2021).

Based on this background, this study was conducted to analyze the development of Bank bjb’s NPL, LDR, BOPO, and ROA during the 2014–2024 period and to examine the simultaneous and partial effects of these three financial ratios on bank profitability. This study served as a modified replication of previous research with different research objects and observation periods, thereby providing relevant findings as a basis for strategic decision-making. The findings may support Bank bjb’s management in managing credit quality, financial intermediation, and operational efficiency, as well as assist regulators, such as the Financial Services Authority, in supervising the performance of Regional Development Banks.

Theoretically, this research was expected to contribute to a deeper understanding of the determinants of bank profitability, particularly in Regional Development Banks, and serve as a reference for future studies. Practically, the findings may provide considerations for investors and stakeholders in making investment decisions, while also contributing to the development of banking research methodologies examining causal relationships among financial variables. Bank bjb during the 2014–2024 period provides an applicable and relevant case context for analyzing the relationship between credit quality, intermediation function, operational efficiency, and profitability (Peraturan Bank Indonesia No. 6/10/PBI/2004 & SEOJK No.14/SEOJK.03/2017, 2017; Peraturan OJK No. 17/POJK.03/2014, 2014; Peraturan Otoritas Jasa Keuangan Republik Indonesia Nomor 4/POJK.03/2017 Tentang Penilaian Tingkat Kesehatan Bank Umum, 2017; SEOJK No. 34/SEOJK.03/2015, 2015; SEOJK No.10/SEOJK.03/2016 Dan Laporan Stabilitas Sistem Keuangan OJK & BI, 2016; Sudarmawanti & Pramono, 2017).

## **METHOD**

This study employed a quantitative approach with descriptive and explanatory research designs to analyze the effects of credit quality (NPL), intermediation function (LDR), and operational efficiency (BOPO) on profitability (ROA) at Bank bjb during the 2014–2024 period. The study used quarterly secondary time-series data consisting of 44 observations obtained from Bank bjb's financial statements and annual reports, as well as official publications from the Indonesia Stock Exchange (IDX) and the Financial Services Authority (OJK). Data collection was conducted through documentation by compiling NPL, LDR, BOPO, and ROA data. The research population consisted of all quarterly financial statements of Bank bjb during the 2014–2024 period, while the sample was determined using saturated sampling, resulting in the inclusion of all 44 quarterly observations.

Data analysis was performed using SPSS through descriptive statistical analysis and inferential analysis. The analysis included classical assumption tests, consisting of normality, multicollinearity, heteroscedasticity, and autocorrelation tests, followed by multiple linear regression analysis to examine the partial and simultaneous effects of NPL, LDR, and BOPO on ROA. In addition, correlation coefficient analysis was conducted to determine the direction and strength of relationships among variables, while the coefficient of determination ( $R^2$  and Adjusted  $R^2$ ) was used to evaluate the extent to which the independent variables explained variations in Bank bjb's profitability.

## **RESULTS AND DISCUSSION**

### **Classic Assumption Test**

#### **1. Normality Test**

Normality tests were carried out to find out whether the residual data in the regression model were distributed normally. In this study, normality testing was carried out using the Kolmogorov-Smirnov test (Undang-Undang Republik Indonesia Nomor 10

Tahun 1998 Tentang Perubahan Atas Undang-Undang Nomor 7 Tahun 1992 Tentang Perbankan, 1998).

Test criteria:

- If the significance value (Asymp. Sig.)  $> 0.05$ , then the residual data is normally distributed.
- If the significance value  $\leq 0.05$ , then the residual data is not normally distributed.

These tests are complemented by histogram-like visualizations and normal P-P plots as additional aids to evaluate the form of residual distribution.

**Table 1.** Kolmogorov-Smirnov test

|                                   |                | Unstandardized Residual |
|-----------------------------------|----------------|-------------------------|
| N                                 |                | 44                      |
| Normal Parameters <sup>a, b</sup> | Mean           | ,0000000                |
|                                   | Std. Deviation | ,00205961               |
| Most Extreme Differences          | Absolute       | ,087                    |
|                                   | Positive       | ,087                    |
|                                   | Negative       | -,070                   |
| Test Statistic                    |                | ,087                    |
| Asymp. Sig. (2-tailed)            |                | ,200 <sup>c, d</sup>    |

a. Test distribution is Normal.

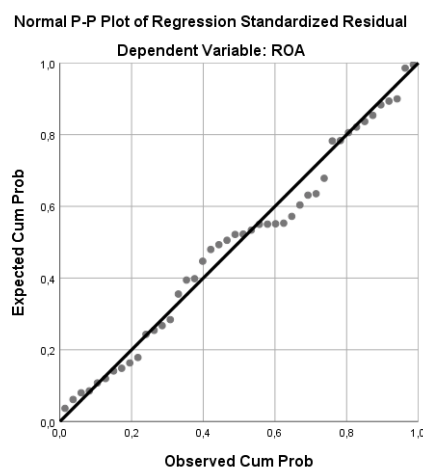
b. Calculated from data.

c. Lilliefors Significance Correction.

d. This is a lower bound of the true significance.

Source: SPSS Output, 2025

Referring to table 1, the empirical results of the Kolmogorov-Smirnov test reflect that the significance number (Asymp. Sig. 2-tailed) is 0.200, which is greater than the significance level  $\alpha = 0.05$ . Therefore, it can be concluded that the residual data is distributed normally, so that the assumption of normality in the regression model has been met. This situation supports the validity of the empirical results of the regression testing carried out (Mulatsih, 2014).



**Figure 1.** Normal P-P Plot

The Normal P–P Plot above indicates a standardized residual distribution pattern from the regression model with the ROA-bound construct. The diagonal lines represent the theoretical normal distribution, while the dots represent the observed residual cumulative distribution.

Visually, the residual points are scattered along a diagonal line and do not reflect extreme deviations. The condition reflects that the residual of the regression model is distributed close to normal, which means that the assumption of normality has been met.

This conclusion also supports the empirical results of previous Kolmogorov-Smirnov statistics which reflect a significance of 0.200 ( $> 0.05$ ). Therefore, the regression model is suitable for further testing because it meets one of the important requirements in classical linear regression.

## 2. Multicollinearity test

The multicollinearity test was aimed at finding out whether a large correlation was found between independent variables in the regression model. High multicollinearity can cause the estimation findings to be unstable and cannot be interpreted correctly.

In this study, a multicollinearity statistical test was carried out by looking at the values of Variance Inflation Factor (VIF) and Tolerance:

Test criteria:

- a. The Tolerance value  $> 0.10$  and  $VIF < 10$  indicate that multicollinearity does not occur.
- b. A Tolerance value of  $\leq 0.10$  or  $VIF \geq 10$  indicates the presence of multicollinearity.

**Table 2. Multicollinearity Test Results**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. | Collinearity Statistics |       |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|-------------------------|-------|
|       |            | B                           | Std. Error | Beta                      |        |      | Tolerance               | VIF   |
| 1     | (Constant) | ,011                        | ,008       |                           | 1,312  | ,197 |                         |       |
|       | NPL        | -,155                       | ,071       | -,316                     | -2,191 | ,034 | ,867                    | 1,153 |
|       | LDR        | ,013                        | ,006       | ,340                      | 2,245  | ,030 | ,787                    | 1,271 |
|       | BOPO       | -,011                       | ,010       | -,153                     | -1,059 | ,296 | ,863                    | 1,159 |

Source: SPSS Output, 2025

Referring to table 2, the findings of the multicollinearity test on the regression model with ROA-bound variables reflect that all independent variables, namely NPL, LDR, and BOPO, have a Tolerance value above 0.10 and a Variance Inflation Factor (VIF) value below 10. Specifically, the Tolerance value for NPLs is 0.867 with a VIF of 1.153; for LDR of 0.787 with VIF of 1.271; and for BOPO of 0.863 with VIF of 1.159. Referring to the general criteria, the regression model is said to be free from multicollinearity problems if the Tolerance value is  $> 0.10$  and VIF is  $< 10$ . Therefore, it can be concluded that no symptoms of multicollinearity are found in this model, which means that each independent variable does not have a high linear correlation with each other and can be allocated simultaneously in regression testing without interfering with the validity of the estimation findings.

### 3. Heteroscedasticity Test

The heteroscedasticity test was performed to see if there was a variance from the residual in all observational values. The heteroscedasticity that occurs in the regression model can lead to estimation inefficiencies.

This study uses the Glejser Test, which is by regressing the residual absolute value to the independent variable.

Test criteria:

- a. If the significance value  $> 0.05$ , then there is no heteroscedasticity.
- b. If the significance value  $\leq 0.05$ , then there are symptoms of heteroscedasticity

**Table 3.** Heteroscedasticity Test Results

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t     | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|-------|------|
|       |            | B                           | Std. Error | Beta                      |       |      |
| 1     | (Constant) | -,001                       | ,005       |                           | -,248 | ,805 |
|       | NPL        | ,030                        | ,044       | ,113                      | ,684  | ,498 |
|       | LDR        | ,005                        | ,003       | ,268                      | 1,551 | ,129 |
|       | BOPO       | -,003                       | ,006       | -,067                     | -,406 | ,687 |

Source: SPSS Output, 2025

Referring to table 3 of the findings of the heteroscedasticity statistical test using the Glejser Test approach, it was found that the statistical significance number (Sig.) or p-value for all independent variables, namely NPL, LDR, and BOPO was 0.498 each; 0,129; and 0.687. All of these values are greater than the significance level of 0.05 (5%). Therefore, it can be concluded that no symptoms of heteroscedasticity were found in the regression model. That is, the variance of the residual or model error is constant (homoskedastis), which is one of the strategic assumptions in classical linear regression. Therefore, this regression model meets the assumption of homogeneity, so that the results obtained are reliable and unbiased due to deviations in the error distribution.

### 4. Autocorrelation Test

The autocorrelation test is aimed at finding out whether a correlation is found between residuals from one period to another. Autocorrelation often occurs in time series data, such as the annual financial data for which this study is intended.

The autocorrelation test was carried out using the Durbin-Watson Test (DW Test) with the following criteria:

- a. DW is close to 2: no autocorrelation occurs.
- b.  $DW < 1.5$ : there is a positive autocorrelation.
- c.  $DW > 2.5$ : there is a negative autocorrelation.

Interpretation was carried out by paying attention to the lower limit (dL) and upper limit (dU) values of the Durbin-Watson table adjusted to the sample volume and the volume of the free variables.

**Table 4. Autocorrelation Test Results**

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate | Durbin-Watson |
|-------|-------------------|----------|-------------------|----------------------------|---------------|
| 1     | ,529 <sup>a</sup> | ,280     | ,226              | ,00214                     | 1,747         |

Source: SPSS Output, 2025

Referring to table 4 of the empirical results of the autocorrelation test using Durbin-Watson statistics, a score of 1.747 was obtained. This value is in the range of 1.5 to 2, which generally reflects that no autocorrelation was found in the assigned regression model. The absence of this autocorrelation suggests that the residual value (prediction error) of one observation does not correlate with the residual value of another observation, so the model fulfills one of the strategic assumptions in classical linear regression. Therefore, this regression model is suitable for analysis because the results of parameter estimation are estimated to be efficient and statistical significance tests (t-test and F-test) can be interpreted validly.

### Multiple Regression Analysis

After the classical assumption test was carried out and the model was declared to meet the BLUE (Best Linear Unbiased Estimator) assumption, the next stage in this study was to conduct multiple linear regression analysis.

**Table 5. Multiple Regression Analysis**

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|
|       |            | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant) | ,011                        | ,008       |                           | 1,312  | ,197 |
|       | NPL        | -,155                       | ,071       | -,316                     | -2,191 | ,034 |
|       | LDR        | ,013                        | ,006       | ,340                      | 2,245  | ,030 |
|       | BOPO       | -,011                       | ,010       | -,153                     | -1,059 | ,296 |

Source: SPSS Output, 2025

Referring to the regression results above, the regression line equation is obtained as follows:

$$\text{ROA}_t = 0.011 - 0.155 \text{ NPL}_t + 0.013 \text{ LDR}_t - 0.011 \text{ BOPO}_t + \varepsilon_t$$

1. The constant of 0.011 assumes that if the variables NPL, LDR and BOPO are constant, then the ROA variable is 0.011
2. The regression coefficient of the NPL variable of  $-0.155$  is assumed that each addition of the NPL variable by one unit will decrease the ROA variable by  $-0.155$  assuming that the other independent variable is of constant magnitude and vice versa
3. The regression coefficient of the LDR variable of  $0.013$  assumes that each addition of the LDR variable by one unit will increase the ROA variable by  $0.013$  assuming that the other independent variable is a constant and vice versa
4. The regression coefficient of the BOPO variable of  $-0.011$  is assumed that each addition of the BOPO variable by one unit will decrease the ROA variable by  $-0.011$  assuming that the other independent variable is of constant magnitude and vice versa

### Correlation Coefficient Analysis

The correlation coefficient test is intended in this study to determine the degree of relationship between each independent variable, namely financing quality (NPL), the role of intermediary (LDR), and the efficiency of operational activities (BOPO), to the rentability-bound construct (ROA) at Bank bjb during the 2014–2024 quarter period.

The correlation coefficient measures the direction and strength of the linear linkage between two variables. The value of the correlation coefficient ranges from -1 to +1, which hints:

1. +1: Perfect positive relationship,
2. 0: No linear relationship,
3. -1: Perfect negative relationships

**Table 6.** Correlation Coefficient Analysis

|      |                     | LDR    | NPL     | BOPO  | ROA     |
|------|---------------------|--------|---------|-------|---------|
| LDR  | Pearson Correlation | 1      | -,308*  | ,316* | ,389**  |
|      | Sig. (2-tailed)     |        | ,042    | ,037  | ,009    |
|      | N                   | 44     | 44      | 44    | 44      |
| NPL  | Pearson Correlation | -,308* | 1       | ,087  | -,434** |
|      | Sig. (2-tailed)     | ,042   |         | ,574  | ,003    |
|      | N                   | 44     | 44      | 44    | 44      |
| BOPO | Pearson Correlation | ,316*  | ,087    | 1     | -,073   |
|      | Sig. (2-tailed)     | ,037   | ,574    |       | ,637    |
|      | N                   | 44     | 44      | 44    | 44      |
| ROA  | Pearson Correlation | ,389** | -,434** | -,073 | 1       |
|      | Sig. (2-tailed)     | ,009   | ,003    | ,637  |         |
|      | N                   | 44     | 44      | 44    | 44      |

Source: SPSS Output, 2025

Referring to table 6 of the results of the Pearson Product Moment Correlation coefficient test that has been obtained and referring to the interpretation guidelines according to the opinion of (Sugiyono., 2022), the relationship between variables in this study can be described as follows:

The LDR (Loan to Deposit Ratio) variable reflects a positive and significant correlation to ROA of 0.389 with a significance value of 0.009. Referring to the classification of r-values, this number falls into the "low" category (0.20–0.399). By squaring the value of the correlation coefficient ( $r^2 = 0.389^2$ ), a value of 0.151 or equivalent to 15.1% is obtained. This means that about 15.1% of the variation in the ROA can be explained by the variation in the LDR. The situation gives an idea that although the relationship is statistically significant, the strength of the linkage between LDR and ROA is at a low level. In other words, the increase in the usability of the intermediation role (through LDR) contributes only a small contribution to increasing the capacity of banks to generate profits.

The NPL (Non-Performing Loan) variable reflects a negative and significant correlation to ROA of -0.434 with a significance of 0.003. The r-value is in the range of 0.40–0.599, which is categorized as a "moderate" relationship. By squaring the

correlation value ( $r^2 = -0.434^2$ ), a value of 0.188 or about 18.8% was obtained. This means that around 18.8% of the dynamics in ROA can be explained by the dynamics in the degree of NPL. This condition indicates that the greater the degree of financing that the bank has repayment problems, the profitability tends to decrease with the strength of the relationship that is quite significant. These empirical results are consistent with the principles of the banking sector, where poor credit quality can reduce interest income and support an increase in loss expenses.

On the other hand, the BOPO variable (Operating Costs to Operating Income) has a negative but not significant correlation with ROA, with an  $r$  value of  $-0.073$  and a significance of  $0.637$ . This value falls into the "very low" category ( $0.00-0.199$ ). The squaring results ( $r^2 = -0.073^2$ ) yielded a value of  $0.0053$  or about  $0.53\%$ , reflecting that only about  $0.5\%$  of the ROA variation could be explained by BOPO. In other words, in the context of this study, the maintenance of the efficiency of operational activities as reflected in the BOPO comparison does not have a strong or significant relationship with the bank's capacity to generate profits.

Overall, the empirical results of correlation testing reflect that only the NPL and LDR variables have a significant relationship with ROA, with explanatory contributions of  $18.8\%$  (moderate negative relationship) and  $15.1\%$  (low positive relationship) respectively. Meanwhile, BOPO has no significant effect and its contribution to the dynamics of ROA is very small, which is less than  $1\%$ .

#### Coefficient Determination Analysis

Determination coefficient analysis is used to measure how far the free variables in the regression model are able to describe the bound variables. In the context of this study, the determination coefficient is intended to determine the extent of the influence of credit quality (NPL), the role of intermediation (LDR), and the efficiency of operational activities (BOPO), on the profitability-bound variable (ROA) as an indicator of Bank bjb's profitability during the 2014–2024 period.

The coefficient of determination is denoted by  $R^2$ , which has values ranging from 0 to 1. The value of  $R^2$  that is getting closer to 1 reflects that the regression model has a better ability to decipher the variations of the bound variables.

**Table 7.** Determination Coefficient Analysis

| Model | R                 | R Square | Adjusted R Square | Std. Error of the Estimate |
|-------|-------------------|----------|-------------------|----------------------------|
| 1     | ,529 <sup>a</sup> | ,280     | ,226              | ,00214                     |

Source: SPSS Output, 2025

Referring to the empirical results of the regression statistical test shown in the Model Summary table, the Adjusted R Square value was  $0.226$ . This means that the  $22.6\%$  variation in the bound variable, namely ROA (Return on Assets), can be explained by the variation of three independent variables in the model, namely BOPO (Operating Expenses to Operating Income), NPL (Non-Performing Loan), and LDR (Loan to Deposit

Ratio). Meanwhile, the remaining 77.4% was explained by other factors outside of this study model, which were not included in this regression analysis.

Thus, although this model is able to explain some of the variability in ROA, other variables outside the model are still found that may have a significant influence on ROA.

### Hypothesis Test

#### 1. F Test (Simultaneous)

The F test is used to find out whether the free variable simultaneously or simultaneously affects the bound variable and to determine the significant degree of relationship of the free variable to the bound variable.

The following is the output of the statistical test of the impact of the independent variables consisting of Credit Quality (NPL), Role of Intermediation (LDR), and Maintenance of Operating Efficiency (BOPO) on the Profitability-bound variable (ROA) simultaneously. This statistical test is aimed at finding out whether these three variables simultaneously have a significant impact on the bank's capacity to form bjb's profit:

H1 : There is an influence of Credit Quality, Intermediation Function, and Operational Efficiency on Profitability

- a. H0 :  $\beta X_1, \beta X_2, \beta X_3 = 0$ , Credit Quality, Intermediation Function, and Operational Efficiency Have No Effect on Profitability
- b. H1 :  $\beta X_1, \beta X_2, \beta X_3 \neq 0$ , Credit Quality, Intermediation Function, and Operational Efficiency Affect Profitability

**Table 8.** F Test Results

| Model |            | Sum of Squares | df | Mean Square | F     | Sig.              |
|-------|------------|----------------|----|-------------|-------|-------------------|
| 1     | Regression | ,000           | 3  | ,000        | 5,186 | ,004 <sup>b</sup> |
|       | Residual   | ,000           | 40 | ,000        |       |                   |
|       | Total      | ,000           | 43 |             |       |                   |

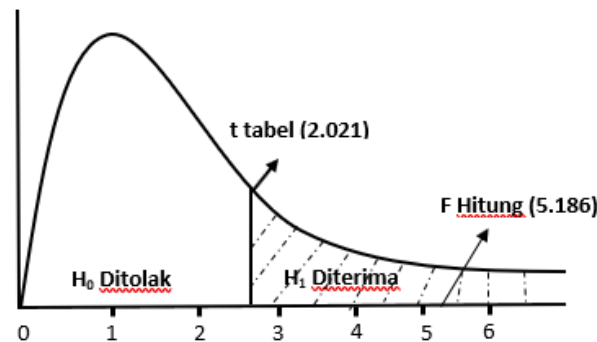
The testing criteria are as follows:

- a. If the value of the sig < 0.05 and the value of f is calculated > f of the table, then H1 is accepted and H0 is rejected
- b. If the value of the sig > 0.05 and the value of f is calculated < ftable, then H0 is accepted and H1 is rejected

referring to the empirical results of regression analysis, the F value was calculated as 5.186 with a significance level of 0.004. To determine whether the regression model is simultaneously statistically meaningful, the value of F is calculated compared with the F of the table at a significance level of 5% ( $\alpha = 0.05$ ), with degrees of freedom (df1 = free construct volume = 3) and (df2 =  $n - k - 1 = 44 - 3 - 1 = 40$ ). referring to the distribution table F, F is  $\approx$  table 2.84.

Since F is calculated (5.156) > F table (2.84) and the significance value is less than 0.05, the null hypothesis (H<sub>0</sub>) is rejected and the alternative hypothesis (H<sub>1</sub>) is accepted. This condition reflects that simultaneously, the construct of Financing Quality (NPL),

Intermediation Function (LDR), and Maintenance of Operational Efficiency (BOPO) contributes a statistically significant impact on Profitability (ROA) so that  $H_1$  is Accepted



**Figure 2.** Curve of Acceptance Results of Test F Hypothesis 1

## 2. T Test (Partial)

The t-test is used to determine whether a partial free variable affects the bound variable and to determine the significant degree of relationship of the free variable to the bound variable.

**Table 9.** T Test Results

| Model |            | Unstandardized Coefficients |            | Standardized Coefficients | t      | Sig. |
|-------|------------|-----------------------------|------------|---------------------------|--------|------|
|       |            | B                           | Std. Error | Beta                      |        |      |
| 1     | (Constant) | ,011                        | ,008       |                           | 1,312  | ,197 |
|       | NPL        | -,155                       | ,071       | -,316                     | -2,191 | ,034 |
|       | LDR        | ,013                        | ,006       | ,340                      | 2,245  | ,030 |
|       | BOPO       | -,011                       | ,010       | -,153                     | -1,059 | ,296 |

Source: SPSS Output, 2025

### 1) There is an Influence of Credit Quality (NPL) on Profitability (ROA)

The hypothesis used in this test is:

$H_2$  : There is an Influence of Credit Quality on Profitability

a.  $H_0$  :  $\beta$  NPL = 0, Credit Quality Has No Effect on Profitability

b.  $H_2$  :  $\beta$  NPLs  $\neq$  0, Credit Quality Affects Profitability

The testing criteria are as follows:

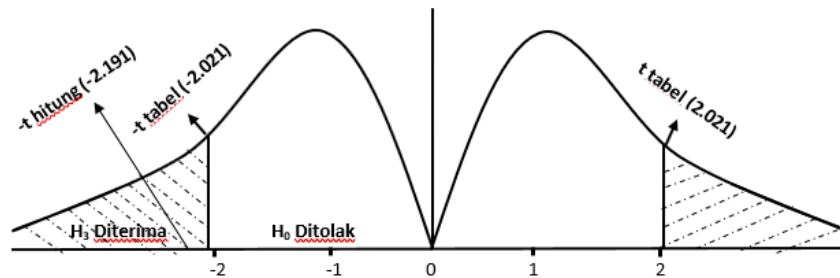
c. If the value of the sig < 0.05 and the value of t is calculated > t of the table, then  $H_2$  is accepted and  $H_0$  is rejected

d. If the value of the sig > 0.05 and the value t of the calculation of the < t of the table then  $H_0$  is accepted and  $H_2$  is rejected

Based on table 4.13, it is known that the probability value (significance) of the variable Credit Quality (NPL) to Profitability (ROA) is partially 0.034, and the calculated t-value is -2.191. Using the significance level of 5% and the degree of freedom (df) =  $n - k - 1 = 44 - 3 - 1 = 40$ , the t-value of the table was obtained of 2.021.

Since the sig value is  $0.034 < 0.05$  and  $t$  calculates  $-2.191 > \text{table } t -2.021$ ,  $H_0$  is rejected and  $H_2$  is accepted. This reflects that the NPL variable contributes a significant impact on ROA.

Negative sign on the  $t$ -value calculated. This means that the greater the degree of NPLs (financing that experiences payment problems), the profitability measured by ROA tends to decrease. Therefore, the alleged research that states that credit quality has an impact on profitability is declared accepted, so  $H_2$  is accepted



**Figure 3.** Curve of Acceptance Results of Hypothesis 2 T Test

2) There is an Influence of the Intermediation Function (LDR) on Profitability (ROA)

The hypothesis used in this test is:

$H_3$  : There is an influence of the intermediation function on profitability

- a.  $H_0 : \beta \text{ LDR} = 0$ , the intermediation function has no effect on profitability
- b.  $H_3 : \beta \text{ LDR} \neq 0$ , Intermediation Function Affects Profitability

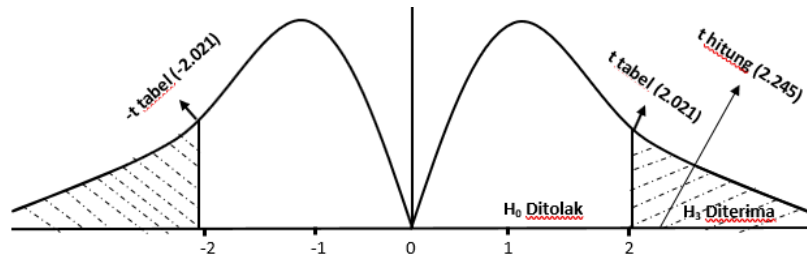
The testing criteria are as follows:

- c. If the value of the sig  $< 0.05$  and the value of  $t$  compute the  $> t$  of the table then  $H_3$  is accepted and  $H_0$  is rejected
- d. If the value of the sig  $> 0.05$  and the value of  $t$  compute  $< t$  of the table then  $H_0$  is accepted and  $H_3$  is rejected

Referring to table 4.13 It is known that the significance value of the LDR variable to ROA is partial is 0.030, and the  $t$ -value is calculated as 2.245. With a significance level of 5% and a degree of freedom ( $df$ ) =  $44 - 3 - 1 = 40$ , then the value of  $t$  of the table is 2.021.

Since the sig value is  $0.030 < 0.05$  and  $t$  calculates  $2.245 > t \text{ table } 2.021$ ,  $H_0$  is rejected and  $H_3$  is accepted. This reflects that the LDR variable has a significant effect on ROA.

The LDR regression coefficient is of unidirectional value, which means that the higher the LDR, the ROA also increases. In other words, the more effective the bank is in redistributing funds (the role of intermediary), the more profitability it will be. Therefore, the hypothesis that the role of intermediation affects profitability is declared accepted, so  $H_3$  is accepted.



**Figure 4.** Curve Acceptance Results of Hypothesis T-Test 3

3) There is an Effect of Operational Efficiency (BOPO) on Profitability (ROA)

The research hypotheses intended in this statistical test are:

H4 : There is an Influence of Operational Efficiency on Profitability

- H0 :  $\beta$  BOPO = 0, Operational Efficiency Has No Effect on Profitability
- H4 :  $\beta$  BOPO  $\neq$  0, Operational Efficiency Affects Profitability

The testing criteria are as follows:

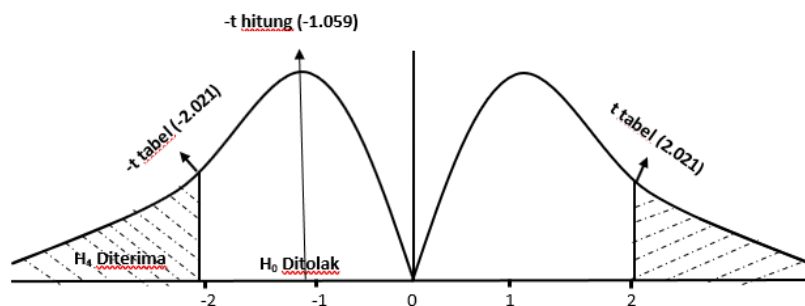
- If the value of the sig < 0.05 and the value of t is calculated > t of the table, then H4 is accepted and H0 is rejected
- If the value of the sig > 0.05 and the value of t compute the < t of the table then H0 is accepted and H4 is rejected

Based on table 4.13, it is known that the sig value of the BOPO variable against ROA is partially 0.296, and the t-value of the calculation is -1.059. With the degree of freedom (df) = 40 and the significance level of 5%, then the value of the table t is 2.021.

Referring to table 4.13, it is known that the GIS value of the BOPO variable to the ROA individually is 0.296, and the t-value of the calculation is -1.059. With the degree of freedom (df) = 40 and the level of statistical significance of 5%, the value of the t table is 2.021.

Since the value of sig is  $0.296 > 0.05$  and t counts  $-1.059 < t$  table  $-2.021$ , H0 is accepted and H4 is rejected. This means that statistically BOPO does not have a statistically significant influence on ROA.

Although the BOPO regression coefficient is negative, reflecting the tendency that increased BOPO suppresses ROA (due to decreased operational efficiency), the impact is not significant. Therefore, the hypothesis that the maintenance of operational efficiency has an effect on profitability is not acceptable in this study so that H4 is rejected



**Figure 5.** Curve of Acceptance Results of Hypothesis 4 T Test

### **The Effect of Credit Quality (NPL), Intermediation Function (LDR), and Operational Efficiency (BOPO) on Profitability (ROA)**

The empirical results of the study reflect that simultaneously, the variables of Credit Quality (NPL), Intermediation Role (LDR), and Operational Efficiency (BOPO) have a significant impact on Bank bjb's Profitability (ROA) during the 2014–2024 period. Referring to the results of the F test, the F value of the calculation was obtained of 5,186, which is greater than the F of the table of 2.84, and the significance value of 0.04, smaller than the significance level of 5%. This reflects that statistically, the combination of these three variables simultaneously contributes to the bank's profitability.

Theoretically, these findings can be explained through the approach of three main theories that are the basis of this study. Risk-Based Theory describes the influence of NPLs, where the high ratio of loans that experience repayment problems can reduce interest income and support an increase in reserve costs, which leads to a decrease in profit. The theoretical perspective of Intermediation outlines the function of LDRs, which reflect the effectiveness of banks in carrying out the role of financial intermediation—redistributing funds raised from the public to the productive sector, potentially supporting increased income (Widyaningsih & Sampurno, 2022). On the other hand, the Theoretical Perspective of Maintaining Operational Efficiency explains how BOPO reflects the maintenance of the efficiency of operating cost management to income, which in the final stage contributes to the influence on profit margins.

These findings are reinforced by several previous studies. (Firmanila, 2023) found that NPLs, LDRs, and BOPO simultaneously contribute significantly to the ROA of commercial banks, emphasizing the importance of credit risk exposure management, the effectiveness of financing distribution, and the efficiency of expenses as a single system in creating profitability. (Ramadanti & Setyowati, 2022) also stated that these three variables are simultaneously able to significantly decipher the variability of ROA, even mentioning that BOPO has an influence on ROA. Furthermore, (Warsa & Mustanda, 2016) emphasized that these three financial ratios contribute to each other's impact, so simultaneous analysis is important in understanding the dynamics of bank profitability. (Suwandi & Oetomo, 2017) also concluded that the simultaneous linkage between NPLs, LDRs, and BOPO to ROA is very strong and significant, making the three benchmarks in the main way in assessing the financial performance of banks.

Practically, these findings reflect that Bank bjb should pay attention to these three aspects of financial management at the same time. Good financing risk management (small NPLs), maximum intermediation strategies (balanced LDR), and operating expense efficiency (small BOPO) must function as bank management priorities to achieve sustainable profitability. Inequality in just one aspect has the potential to weaken the bank's overall financial performance. Therefore, an integrative and data-based management strategy is needed to maintain asset quality, fund distribution effectiveness, and maintain the efficiency of operating activities simultaneously.

In other words, a bank's profitability cannot be separated from the interaction between risk exposure, intermediation function, and cost efficiency. These three form the

main foundation in maintaining ROA at a healthy and competitive degree in the midst of the dynamics of the banking sector that continues to grow.

#### **The Effect of Credit Quality (NPL) on Profitability (ROA)**

In this study, it was found that the Credit Quality (NPL) ratio has a negative and significant effect on the Profitability (ROA) at Bank bjb during the 2014–2024 period. This condition is proven through the results of the partial t-test, where the calculated t-value of -2.191 is greater in absolute terms than the t-table of -2.021, and the significance value of 0.034 which is below the significance level of 5%. This means that statistically it can be concluded that the higher the NPL ratio, the less the performance of the bank's ability to create profits seen in ROA.

This phenomenon is very logical from the perspective of Risk-Based Theory, which emphasizes that increased credit risk exposure reflected through rising NPLs will force banks to set aside part of their profits as a deduction for impairment losses (CKPN). This situation in the final stage cuts the net profit obtained from the allocation of the bank's overall assets, thus reducing the value of ROA. Historical data reinforce this empirical result. For example, in the first quarter of 2023, when NPLs reached 1.31%, the ROA fell sharply to 0.25%, which was the lowest figure in the entire study period. Similarly, in the fourth quarter of 2024, NPLs increased dramatically to 2.16%, and ROA fell to 0.81%, reflecting profitability pressures as credit quality deteriorated.

On the other hand, when NPLs are at a small level, ROA actually records a statistically significant increase. For example, in the third quarter of 2017, NPLs reached a low of 0.88%, and at the same time ROA increased to 1.20%. This phenomenon reflects that sound credit management and low risk of default contribute to the space for banks to maximize interest income and minimize reserve costs, resulting in increased profitability.

This research is empirically supported by Dewi (2018:3), who states that increasing NPLs increases the cost of reserve losses and erodes net profit. In addition, (Nurfitriani, 2021) and (Firmanila, 2023) stated that high NPLs have the opposite impact on ROA because they reduce interest income and increase the bank's operating expenses. In other words, the greater the financing that experiences payment problems, the greater the pressure on the bank's financial performance.

The practical implications of these findings are clear: Bank bjb needs to strengthen its financing risk exposure management strategy, including in terms of creditworthiness analysis, ongoing credit supervision, and the management and settlement of financing that experiences repayment problems. In addition, strict internal controls and the implementation of data-driven technologies for credit risk exposure prediction can help reduce NPL ratios. By maintaining healthy asset quality, Bank bjb can ensure optimal and sustainable ROA performance in the long term

#### **The Effect of the Intermediation Function (LDR) on Profitability (ROA)**

In this study, it was found that the Intermediation Function (LDR) ratio had a positive and significant effect on the Profitability (ROA) at Bank bjb during the period 2014–2024. This is shown through the results of the partial t-test, where the calculated t-value of 2.245 is greater than the t-table of 2.021, with a significance value of 0.030 which

is smaller than the significance level of 5%. This means that statistically, the higher the LDR ratio within the reasonable limit, the higher the bank's profitability level reflected in the ROA.

These empirical results are consistent with the theoretical perspective of Intermediation which emphasizes that banks act as financial intermediaries between groups that have excess funds and those that need funding. The large LDR comparison reflects the effectiveness of banks in redistributing funds collected from the public into productive credit. The greater the proportion of funds disbursed in the form of credit, the greater the potential for interest income obtained, thus supporting an increase in profit and having a direct impact on increasing ROA.

Historical data support this linkage. For example, in the third quarter of 2019, Bank bjb's LDR was 92.14%, and ROA was at 1.38%, reflecting high profitability performance in line with high intermediation activities. Similarly, in the fourth quarter of 2016, when the LDR rose to 93.63%, the ROA reached 1.43%, which was one of the highest levels in the study period. This condition reflects that when funds collected from the public can be optimally provided in the form of credit, the bank's profitability also increases.

These empirical results are reinforced by (Septiani & Lestari, 2016) research which states that large LDRs reflect banks' success in redistributing credit, which has a positive impact on interest income and supports an increase in ROA. On the other hand, (Thalib, 2016) also mentioned that the maximum LDR is an indicator that public funds have been used productively, which in the final stage supports the increase in bank profits. Therefore, the empirical results of this study are consistent with the previous view that effectiveness in the intermediation function is one of the main determinants of bank profitability.

Nevertheless, it is important to note that the increase in LDR should remain within the corridor of prudence. An excessively high LDR without strong credit risk exposure management can increase liquidity risk exposure and troubled financing. Therefore, Bank bjb needs to maintain a balance between aggressive lending and the principle of prudence in fund management. Strategies such as credit diversification, improving the quality of creditworthiness testing, and regular debtor monitoring can help keep LDRs within healthy limits and ensure the sustainability of bank profitability in the future.

#### **The Effect of Operational Efficiency (BOPO) on Profitability (ROA)**

In this study, it was found that Operational Efficiency (BOPO) had a negative but not significant effect on Profitability (ROA) at Bank bjb during the period 2014–2024. Referring to the results of the partial t-test, a calculated t value of -1.059 was obtained, which is smaller in absolute terms than the t table of -2.021, and a significance value of 0.296, far above the significance level of 5%. Therefore, statistically, BOPO did not have a significant influence on ROA in this study period, even though the direction of the relationship tended to be negative.

These findings are in line with the Operational Efficiency Theory, which states that efficiency in managing operational costs is essential to increase profitability. Theoretically, the smaller the BOPO ratio, the more efficient the bank's performance, and

the more likely it is to increase ROA. However, in the context of Bank bjb, the influence of BOPO does not reflect statistical significance. This condition reflects that maintaining operational cost efficiency, although important, has not been the main determining factor in shaping the bank's profitability during this period.

This insignificance can be explained from both a practical and empirical perspective. The data reflects that despite the change in BOPO comparison, Bank bjb's ROA remains in a relatively stable range. For example, in the first quarter of 2017, BOPO was at 88.25%, but ROA was still recorded at 1.24%. Likewise, in the second quarter of 2022, BOPO was 86.43%, but ROA was still recorded at 1.15%. This reflects that Bank bjb may have succeeded in balancing the burden of operating expenses with other revenues such as fee-based income or maintaining efficiency through digitalization which helps maintain profitability.

The results of this study are consistent with the findings of (Maulana et al., 2021) who stated that BOPO does not always have a significant effect on ROA, depending on how well the bank is able to manage cost efficiency and optimize other revenues. (Suwandi & Oetomo, 2017) also stated that under certain conditions, BOPO does not contribute a statistically significant impact on profitability, especially when banks have a solid expense control system or strong alternative income origins (Widyastuti & Aini, 2021).

The implications of these findings reflect that Bank bjb should reduce the influence of BOPO on ROA by not only focusing on cost efficiency, but also supporting the increase in non-interest income and using technology for long-term efficiency to support sustainable profitability.

## CONCLUSION

Based on the results of the study, it was concluded that Bank bjb's credit quality during the 2014–2024 period, proxied by the Non-Performing Loan (NPL) ratio, was classified as very healthy, while the intermediation function, proxied by the Loan-to-Deposit Ratio (LDR), remained stable and within a healthy range. Operational efficiency, measured by the ratio of Operating Expenses to Operating Income (BOPO), was relatively stable but was still categorized as less efficient due to relatively high operating expenses. Meanwhile, profitability, proxied by Return on Assets (ROA), was at the lower threshold of the healthy category. Simultaneously, credit quality, the intermediation function, and operational efficiency significantly affected Bank bjb's profitability. Specifically, credit quality had a significant negative effect, the intermediation function had a significant positive effect, and operational efficiency did not have a significant effect on profitability. Therefore, Bank bjb should strengthen credit risk management through improved credit assessment, debtor monitoring, the implementation of early warning systems, and data-driven restructuring strategies, while maintaining an optimal balance between credit distribution and fund collection to manage LDR effectively. Furthermore, the bank should enhance operational efficiency through digitalization, process automation, cost control, and the expansion of fee-based income sources. Revenue diversification, market

expansion, technology and data utilization, and service innovation should also be strengthened to support sustainable profitability and competitiveness.

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