

The Effect of Non Performing Loans (NPL), Liquidity (LDR), and Net Interest Margin (NIM) On Return On Assets (ROA) at PT. Bank Rakyat Indonesia (Persero) tbk For The 2013-2025 Period

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Abstract

This study aims to examine the effect of Non-Performing Loans (NPL), Liquidity (LDR), and Net Interest Margin (NIM) on Return on Assets (ROA) at PT Bank Rakyat Indonesia (Persero) Tbk for the 2013-2025 period. A quantitative research approach was employed using secondary data obtained from the company's annual financial statements. The data were analyzed using descriptive statistics, classical assumption tests, multiple linear regression correlation analysis, coefficient of determination, and hypothesis testing with SPSS 25. The findings indicate that NPL and LDR have no significant partial effect on ROA, while NIM had a significant partial effect on ROA, simultaneously NPL, LDR, and NIM simultaneously affected ROA, the correlation coefficient of 0.761 indicates a strong relationship between the independent variables and ROA. Furthermore, the coefficient of determination shows that The Adjusted R-Square value of 0.439 indicates that the model's ability to explain the dependent variable is 56.1%. This suggests that the regression model in this study is quite effective in explaining the variation in Return on Assets (ROA).

Keywords:

Non Performing Loans (NPL), Liquidity (LDR), Net Interest Margin (NIM), Return on Assets (ROA)

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INTRODUCTION

Bank play a strategic role in supporting economic growth by serving as financial intermediaries that pool funds from entities with excess liquidity and distribute them to entities with funding shortfalls through lending activities. In addition to facilitating financial transactions, banks also contribute to maintaining the stability of the financial system and promoting sustainable economic development. Therefore, maintaining financial performance has become one of the primary objectives of banking institutions, as it reflects operational efficiency, financial health, and public trust. One of the most widely used indicators for evaluating a bank financial performance is Return on Assets (ROA). ROA measures a bank ability to generate profit from its total assets, indicating how efficiently management utilizes available resources to achieve profitability. A higher ROA reflects better financial performance and demonstrates the bank ability to maximize revenue through effective asset management.

Bank profitability is influenced by several internal financial factors, particularly credit risk, liquidity, and the ability to generate interest income. Credit risk is commonly measured using the Non Performing Loans ratio, which reflects the quality of a bank loan portfolio. From the perspective of Financial Intermediation Theory, NPL is related to the effectiveness of the bank intermediation function because loans are the main form of funds channeled by bank to borrowers. An increase in NPL indicates a deterioration in loan quality, which may increase the potential for credit losses and reduce income generated from lending activities, thereby potentially decreasing ROA. However, the extent of this effect depends on the bank's ability to manage credit risk and maintain the quality of its loan portfolio. Therefore, effective credit risk management may weaken the impact of fluctuations in NPL on bank profitability. Liquidity is represented by the Loan to Deposit Ratio, which measures the bank effectiveness in channeling third-party funds into productive loans while maintaining adequate liquidity. From the perspective of Financial Intermediation Theory, LDR reflects the extent to which banks perform their intermediation function by channeling funds collected from third parties into loans. A higher LDR indicates greater utilization of funds for lending activities, which may increase interest income and potentially improve ROA. However, an excessively high LDR may increase liquidity risk if the bank's lending exceeds its ability to maintain sufficient liquidity. Therefore, effective liquidity management is necessary to balance loan distribution and liquidity maintenance so that changes in LDR do not necessarily result in significant changes in ROA. Meanwhile, Net Interest Margin measures the efficiency of earning assets in generating net interest income, which constitutes the primary source of revenue for commercial bank. From the perspective of Signaling Theory, NIM can serve as an indicator of management's ability to manage earning assets and generate net interest income. A higher NIM indicates that the bank is more effective in utilizing its earning assets to generate interest income, which can strengthen profitability as reflected in ROA. Therefore, an increasing NIM may provide a positive signal regarding the bank's financial performance and its ability to generate returns from its assets.

PT Bank Rakyat Indonesia (Persero) Tbk is one of Indonesia's largest state-owned commercial bank with a strong focus on financing micro, small, and medium enterprises (MSMEs). During the 2013-2025 observation period, fluctuations in NPL, LDR, NIM, and ROA reflected changes in credit quality, liquidity management, and profitability performance. These

fluctuations indicate that effective management of credit risk, liquidity, and earning assets remains essential to maintaining sustainable profitability.

Table 1. Data PT Bank Rakyat Indonesia (Persero) Tbk For the 2013-2025 Period

Year	NPL (%)	LDR (%)	NIM (%)	ROA (%)
2013	1,27	86,13	7,76	3,41
2014	1,26	79,56	7,07	3,02
2015	1,17	84,38	7,46	2,89
2016	1,06	85,28	7,49	2,61
2017	1,10	85,42	7,18	2,58
2018	1,18	86,26	6,61	2,50
2019	1,31	88,06	6,32	2,43
2020	1,24	86,78	5,57	1,16
2021	1,73	87,33	7,40	1,83
2022	1,91	82,52	7,74	2,76
2023	2,30	88,18	7,62	3,07
2024	2,78	99,21	7,81	3,04
2025	3,07	103,73	7,47	2,68

Source: Data processed by researchers

From Table 1, the minimum Non Performing Loan (NPL) ratio occurred in 2016 at 1.06%, while the maximum occurred in 2025 at 3.07%, with a mean of 1.64%. Although the average is still relatively low, the upward trend toward the end of the period indicates that credit quality is deteriorating and warrants the attention of bank management. The minimum Liquidity Ratio (LDR) was 79.56%, the maximum was 103.73%, and the mean was 88.5%. This average value remains within a healthy range. However, the increase that exceeded 100% at the end of the period warrants attention as it could heighten the bank's liquidity risk. The Net Interest Margin (NIM) fluctuated throughout the study period, with a minimum value of 5.57%, a maximum value of 7.82%, and a mean of 7.22%. Financial profitability, as proxied by Return on Assets (ROA), had a minimum value of 1.16%, a maximum value of 3.41%, and a mean of 2.61%. The graph shows a downward trend from the initial period through 2020, followed by a significant increase through 2023, and a slight decline in the final period. This indicates that the bank's financial profitability (ROA) faced some pressure but was able to recover and remain at a relatively good level.

The results from Hidayat, et al (2022) using Vector Error Correction Model (VECM) analysis, indicate that the BOPO and LDR variables have a positive effect on ROA. The NIM and NPL variables have a negative effect on ROA at Bank Rakyat Indonesia (Persero) for the period 2009-2020. Meanwhile, other research by Ramadanti & Setyowati (2022), which utilized the Eviews 10 program, indicated that the variables NPL, LDR, BOPO, and NIM simultaneously influence ROA. Based on the results of the t-test, it can be concluded that NPL and LDR do not have a significant effect on ROA, whereas the variables BOPO and NIM have a significant effect on ROA.

The findings of previous studies indicate that the relationship between NPL, LDR, and NIM and bank profitability is not entirely consistent. Differences in research results may be influenced by differences in the characteristics of the banks studied, observation periods,

economic conditions, and the effectiveness of bank management in managing credit risk, liquidity, and earning assets. Therefore, further research is needed to examine the relationship between these variables using a longer observation period and focusing on PT Bank Rakyat Indonesia (Persero) Tbk, particularly for the 2013–2025 period, several studies concluded that NPL and LDR significantly influence profitability, whereas other studies found no significant relationship. In contrast, NIM has generally been identified as one of the most influential determinants of bank profitability.

These inconsistent findings indicate the existence of a research gap, thereby providing the basis for further investigation using the most recent financial data of PT Bank Rakyat Indonesia (Persero) Tbk. This study contributes to the existing literature by providing empirical evidence from PT Bank Rakyat Indonesia (Persero) Tbk over a 13 year observation period from 2013 to 2025. The period covers different economic conditions, including the pre-pandemic, COVID-19 pandemic, and post-pandemic periods, providing a broader perspective on the relationship between NPL, LDR, NIM, and ROA. The focus on a major state-owned bank with a strong role in financing the Indonesian MSME sector also provides a specific institutional context that may contribute to the understanding of bank profitability. Therefore, this study aims to examine the effect of Non-Performing Loans (NPL), Loan to Deposit Ratio (LDR), and Net Interest Margin (NIM) on Return on Assets (ROA) at PT Bank Rakyat Indonesia (Persero) Tbk during the 2013–2025 period. This study is expected to contribute empirical evidence regarding the relationship between credit risk, liquidity, and net interest income efficiency and bank profitability over a period covering pre-pandemic, pandemic, and post-pandemic conditions.

LITERATURE REVIEW

Financial Intermediation Theory

Gurley and Shaw (1960) Bank's are characterized as financial intermediaries that mobilize funds from surplus economic units and channel them to deficit units through lending. The effectiveness of this intermediation function determines a bank ability to generate income while maintaining adequate liquidity. Consequently, bank are expected to optimize the allocation of mobilized funds without compromising their liquidity positions. In this study, financial intermediation theory serves as the theoretical framework for explaining the relationship of the LDR and NPL on ROA, given that the NPL and LDR reflects a bank effectiveness in carrying out its intermediation function.

Risk Management Theory

Santomero (1977) posits that bank are required to identify, assess, monitor, and manage the various risks arising from their business activities in order to maintain financial stability and achieve sustainable profitability. Effective risk management enables bank to minimize potential losses associated with credit, liquidity, market, and operational risks. Consequently, the implementation of robust risk management practices is crucial for maintaining financial performance and ensuring the operational sustainability of banking institutions. In this study, risk management theory serves as the theoretical foundation for explaining the relationship between NPL and the LDR and measured by ROA.

Signalling Theory

Ross (1977) This theory posits that management possesses more information regarding a company's financial position than external stakeholders do. Consequently, management utilizes financial information to convey signals aimed at reducing information asymmetry. Financial metrics presented in annual reports serve as key signals for investors and other stakeholders in

assessing a company's performance and future prospects. In this study, signaling theory explains that the NIM reflects management's ability to efficiently utilize interest-earning assets, thereby signaling positive bank financial performance a factor reflected in the ROA.

Non Performing Loan (NPL)

Non Performing Loan (NPL) is a situation in which a customer is no longer able to repay part or all of their obligations to the bank as promised. This ratio reflects a bank ability to manage problem loans the higher the ratio, the poorer the credit quality and the greater the credit risk resulting from non performing loan.

Operational Definition and Formula:

$$\text{Non Performing Loan} = \frac{\text{Non Performing Loan}}{\text{Total Loans}} \times 100\%$$

Loan to Deposit Ratio (LDR)

Loan to Deposit Ratio (LDR) is a ratio used to measure the comparison between the amount of loans disbursed and the funds mobilized from the public, as well as the bank own capital. The higher the Loan to Deposit Ratio (LDR), the greater the profit earned by the bank, assuming that the bank is able to disburse its loans effectively.

Operational Definition and Formula:

$$\text{Loan to Deposit Ratio} = \frac{\text{Total Loans}}{\text{Total Third Party Funds}} \times 100\%$$

Net Interest Margin (NIM)

Net Interest Margin (NIM) is a ratio used to assess a bank management ability to manage earning assets in order to generate net income. This ratio is essential for bank management, as it helps minimize the risk of banks facing problems.

Operational Definition and Formula:

$$\text{Net Interest Margin} = \frac{\text{Net Interest Income}}{\text{Average Earning Assets}} \times 100\%$$

Return on Asset (ROA)

Return on Assets (ROA) is a ratio used to assess the extent to which investments are generating returns in line with expectations.

Operational Definition and Formula:

$$\text{Return On Assets} = \frac{\text{Net Income}}{\text{Total Assets}} \times 100\%$$

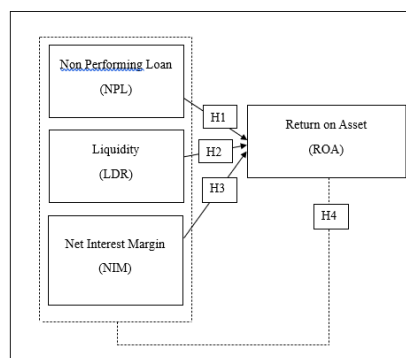


Figure 1

Conceptual Framework

H1: Non Performing Loans (NPL) have a significant partial effect on Return on Assets (ROA)

H2: Liquidity (LDR) have a significant partial effect on Return on Assets (ROA)

H3: Net Interest Margin (NIM) have a significant partial effect on Return on Assets (ROA)

H4: Non Performing Loans (NPL), liquidity (LDR), and Net Interest Margin (NIM) simultaneously have a significant effect on Return on Assets (ROA)

METHODS

This study employs a quantitative associative research design. The research object was PT Bank Rakyat Indonesia (Persero) Tbk. For data collection, the researcher used secondary data obtained from the official website of PT Bank Rakyat Indonesia Tbk (www.bankbri.co.id).

Operational of Variables

Variable	Operational Definition	Formula	Scale
Non Performing Loans (NPL)	Measure the level of non performing loans and the quality of the bank loan portofolio	$\text{NPL} = \frac{\text{Non Performing Loans}}{\text{Total Loans}} \times 100\%$	Ratio
Liquidity (LDR)	Measures the bank's ability to channel third-party funds into loans while maintaining liquidity.	$\text{LDR} = \frac{\text{Total Loans}}{\text{Third-Party Funds}} \times 100\%$	Ratio
Net Interest Margin (NIM)	Measures the bank's ability to generate net interest income from its productive assets	$\text{NIM} = \frac{\text{Net Interest Income}}{\text{Average Earning Assets}} \times 100\%$	Ratio
Return on Asset (ROA)	Measures the bank's ability to generate profit from the assets it owns.	$\text{ROA} = \frac{\text{Net Income}}{\text{Total Assets}} \times 100\%$	Ratio

An independent variable, also known as a free variable, is a variable that influences or causes a change in the value of the dependent variable. According to Tanjung & Mulyani (2021) An independent variable is a variable suspected of causing the dependent variable. The population in this study consists of the financial statements of PT Bank Rakyat Indonesia (Persero) Tbk for the period 2013-2025. The study uses 13 annual observations covering the period from 2013 to 2025. The number of observations is determined by the research design, which focuses specifically on PT Bank Rakyat Indonesia (Persero) Tbk and uses annual financial data for the entire observation period. Therefore, the study does not employ cross-sectional observations from multiple bank, but instead examines the development and relationship among NPL, LDR, NIM, and ROA within a single bank over 13 consecutive years. This approach allows the study to capture changes in the bank financial performance across different economic conditions, including the pre-pandemic, pandemic, and post-pandemic periods. According to Wibowo (2021) a sample is a portion or representative of the population under study. Research conducted using only a portion or representative of the population is known as sample research.

Sample research is a research approach that generalizes its findings, meaning that the research conclusions are presented and or drawn as applicable to the entire population. The samples used in this study are the Balance Sheet, Income Statement, and Notes to the Financial Statements. Techniques for data collection Literature Review is a technique for gathering data from existing theories found in books, journals, and articles related to the research topic. Internet Research, this method involves visiting the company official website to analyze research data.

Data Analysis Techniques

1. Descriptive statistical tests

According to Sahir (2021) descriptive statistics is a method of analyzing data by describing the collected data without drawing conclusions that apply to the general population.

2. Classical Assumption Tests:

- Normality Test, normality test is used to determine whether the independent and dependent variables are normally distributed. A good regression model should include graphical analysis and statistical tests, subject to certain conditions. The normality tests used in this study are as follows. Histogram Test, Graphical Analysis Test (Normal P-Plot), and Kolmogorov-Smirnov Test.
- Multicollinearity Test, the purpose of the multicollinearity test is to determine whether there is correlation among the independent variables in a regression model. A good regression model should not show any correlation among the independent variables.
- Heteroskedastisitas Test, the Scatterplot Method and Glejser Test. The basis for decision making is as if the significance value is >0.05 , then the data do not show a heteroscedastic distribution.
- Autocorrelation Test, two measures used to determine the presence or absence of autocorrelation are the Durbin-Watson test and the Runs test.

Classical Assumption Test	Test Result	Conclusion
Nomality Test	Sig. = $0.200 > 0.05$	The residuals are normally distributed.
Multicollinearity Test	VIF values < 10 and Tolerance values > 0.10	There is no multicollinearity among the independent variables.
Heteroscedasticity Test	Sig. values > 0.05	There is no indication of heteroscedasticity.
Autocorrelation Test	Runs Test Sig. = $0.253 > 0.05$	There is no indication of autocorrelation.

3. Correlation Coefficient Test

The correlation coefficient is a measure of the strength of the relationship between one variable and another. The correlation coefficient ranges from 0 to 1. Therefore, the relationship between the variables is stronger as the coefficient approaches 1 conversely, as it approaches 0, the relationship becomes weaker.

4. Multiple Linear Regression Test

Multiple Linear Regression is used to test the relationship or influence of more than one independent variable on a dependent variable. In this study, this model aims to determine the direction and influence of the independent variables on the dependent variable.

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3$$

Notes:

Y	= Dependen Variable (ROA
X1	= First independent variable (NPL)
X2	= Second independent variable (LDR)
X3	= Third independent variable (NIM)
b1, b2, b3	= Regression coefficients for the independent variables
a	= Constant

5. Hypothesis Testing T-Test (Partial)

The t-test is used to determine the extent to which each independent variable, The criterion is to compare the table value with the calculated value based on the degrees of freedom ($df = n-k-1$) and the significance level (α). The formula for the significance test of the product-moment correlation is if the calculated t-value exceeds the critical t-value (calculated $t > \text{critical } t$) and the significance probability is $\text{significance} < 0.05$, then H_0 is rejected and H_1 is accepted, meaning that the independent variable has a significant effect on the dependent variable and if the calculated t-value is less than the table t-value (calculated $t < \text{table } t$) and the significance probability is greater than 0.05 ($\text{significance} > 0.05$), then H_0 is accepted and H_1 is rejected, meaning there is no significant effect of the independent variable on the dependent variable.

6. Simultaneous Test (F-test)

The F-test is a test of the regression coefficients simultaneously. The F-test is used to determine whether the independent variables collectively influence the dependent variable, as well as to determine whether all variables have a simultaneous relationship with the dependent variable. To calculate the F-table value, use the formula $df = (n-k-1)$. The formula is if the calculated F-value is less than the table F-value and $\text{sig} > 0.05$, then H_0 is accepted and H_1 is rejected. therefore, there is no significant simultaneous effect of all independent variables on the dependent variable and if the calculated F-value is greater than the table F-value and the $\text{sig} < 0.05$, then H_0 is rejected and H_1 is accepted. therefore, all independent variables collectively have a significant effect on the dependent variable.

7. Coefficient of Determination (R^2) Test

Used to determine the extent of the independent variables' influence on the dependent variable. If the coefficient of determination in the regression model remains small or approaches zero, the influence of all independent variables on the dependent variable is smaller; conversely, if the value approaches 100% the influence of all independent variables on the dependent variable is greater.

RESULT AND DISCUSSION

Descriptive Statistical Analysis

Descriptive statistics were used to provide an overview of the research variables, including Non Performing Loans (NPL), Liquidity (LDR), Net Interest Margin (NIM), and Return on Assets (ROA) for the 2013-2025 observation period.

Table 2. Indicator Data of PT Bank Rakyat Indonesia (Persero) Tbk For 2013-2025
Period

Year	NPL	LDR	NIM	ROA
2013	1,27	86,13	7,76	3,41
2014	1,26	79,56	7,07	3,02
2015	1,17	84,38	7,46	2,89
2016	1,06	85,28	7,49	2,61
2017	1,10	85,42	7,18	2,58
2018	1,18	86,26	6,61	2,50
2019	1,31	88,06	6,32	2,43
2020	1,24	86,78	5,57	1,16
2021	1,73	87,33	7,40	1,83
2022	1,91	82,52	7,74	2,76
2023	2,30	88,18	7,62	3,07
2024	2,78	99,21	7,81	3,04
2025	3,07	103,73	7,47	2,68

Source: Data processed by researchers

Table 3. Descriptive Statistical Analysis Test

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Kredit Macet (NPL)	13	1.06	3.07	1.6446	.6752
Likuiditas (LDR)	13	79.56	103.73	87.9108	6.5186
Pendapatan Bunga Bersih (NIM)	13	5.57	7.81	7.1923	.6591
Rentabilitas Keuangan (ROA)	13	1.16	3.41	2.6138	.5821
Valid N (listwise)	13				

Source: Output SPSS 25

Based on Table 3 the values of NPL, LDR, NIM, and ROA fluctuated throughout the observation period. These fluctuations indicate changes in the bank credit quality, liquidity, efficiency in generating interest income and overall profitability. Such variations provide an appropriate basis for examining the relationship between the independent variables and return on asset.

Classical Assumptions Test

Normality Test

Table 4
Results of the Normality Test (Kolmogorov-Smirnov)

Iola The Effect of Non-Performing Loans (NPL), Liquidity (LDR), And Net Interest Margin (NIM) on Return On Assets (ROA) at PT. Bank Rakyat Indonesia (Persero) Tbk For the 2013–2025 Period

One-Sample Kolmogorov-Smirnov Test

		Unstandardized Residual
N		13
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	.37774980
Most Extreme Differences	Absolute	.142
	Positive	.112
	Negative	-.142
Test Statistic		.142
Asymp. Sig. (2-tailed)		.200 ^{c,d}

a. Test distribution is Normal.

b. Calculated from data.

c. Lilliefors Significance Correction.

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

Source: Output SPSS 25

Based on the results of the normality test using the Kolmogorov-Smirnov test in Table 3 above, it can be seen that the significance value is 0.200, which is greater than 0.05 ($0.200 > 0.05$); therefore, it can be concluded that the data in this study are normally distributed.

Multicollinearity Test

Table 5. Multicollinearity Test Results

		Coefficients ^a					Collinearity Statistics	
		Unstandardized Coefficients	Std. Error	Standardized Coefficients	t	Sig.	Tolerance	VIF
Model 1	(Constant)	-2.526	3.535		-.714	.548		
	Kredit Macet (NPL)	-.139	.385	-.162	-.362	.758	.235	4.262
	Likuiditas (LDR)	.002	.037	.024	.059	.937	.278	3.591
	Pendapatan Bunga Bersih (NIM)	.720	.225	.816	3.196	.013	.719	1.391

a. Dependent Variable: Rentabilitas Keuangan (ROA)

Source: Output SPSS 25

Based on Table 5, it can be seen that the tolerance and VIF values for NPL, LDR, and NIM are still within safe limits. The NPL variable has a tolerance value of 0.235 ($0.235 > 0.10$) and a VIF of 4.262 ($4.262 < 10$). The LDR variable has a tolerance value of 0.278 ($0.278 > 0.10$) and a VIF of 3.591 ($3.591 < 10$). And the NIM variable has a tolerance value of 0.719 ($0.719 > 0.10$) and a VIF of 1.391 ($1.391 < 10$). Based on the multicollinearity test criteria namely it can be concluded that there is no multicollinearity among the three variables in the regression model.

Heteroscedasticity Test

Table 6
Heteroscedasticity Test Results (Glejser)

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	2.266	2.037		.295
	Kredit Macet (NPL)	.093	.222	.269	.683
	Likuiditas (LDR)	-.019	.021	-.514	.403
	Pendapatan Bunga Bersih (NIM)	-.071	.130	-.199	.599

a. Dependent Variable: ABS_RES

Source: Output SPSS 25

Based on Table 6, which presents the results of the heteroscedasticity test using the Glejser method, it can be seen that the NPL variable has a significance value of (0.683 > 0.05), LDR variable has a value of (0.403 > 0.05), and the NIM variable has a value of (0.599 > 0.05). It can therefore be concluded that none of the independent variables in this study exhibit heteroscedasticity. This is consistent with the scatterplot analysis, which shows that the data points are randomly distributed and do not form any specific pattern.

Autocorrelation Test

Table 7. Autocorrelation Test Results (*Durbin Watson Test*)

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.761 ^a	.579	.439	.43619	1.225

a. Predictors: (Constant), Pendapatan Bunga Bersih (NIM), Likuiditas (LDR), Kredit Macet (NPL)

b. Dependent Variable: Rentabilitas Keuangan (ROA)

Source: Output SPSS 25

Based on Table 7, the Durbin Watson value is 1.225, using a significance level of 0.05. The sample size (n) is 13, and the number of independent variables (k) is 3. Therefore, the results obtained from the Durbin Watson test are $dL \leq d \leq dU$, or $0.7147 < 1.225 < 1.8159$. The results of the Durbin-Watson test fall within the inconclusive range. Therefore, an additional test using the Runs Test was conducted to obtain a more definitive conclusion.

Table 8. Runs Test Result

Runs Test	
	Unstandardized Residual
Test Value ^a	.03095
Cases < Test Value	6
Cases >= Test Value	7
Total Cases	13
Number of Runs	5
Z	-1.144
Asymp. Sig. (2-tailed)	.253

a. Median

Source: Output SPSS 25

Based on the results of the Runs Test in Table 8, the Asymp. Sig. (2-tailed) value was 0.253, which is ($0.253 > 0.05$). This indicates that the residual data are randomly distributed, meaning there is no specific pattern in their distribution. Therefore, it can be concluded that there is no autocorrelation in the regression model used in this study.

Classical Assumption Test	Test Result	Conclusion
Nomality Test	Sig. = $0.200 > 0.05$	The residuals are normally distributed.
Multicollinearity Test	VIF values < 10 and Tolerance values > 0.10	There is no multicollinearity among the independent variables.
Heteroscedasticity Test	Sig. values > 0.05	There is no indication of heteroscedasticity.
Autocorrelation Test	Runs Test Sig. = $0.253 > 0.05$	There is no indication of autocorrelation.

Hypothesis Testing T-Test (Partial)

Table 9. Parcial Test (T test) Result

Coefficients ^a					
Model		Unstandardized Coefficients		Standardized Coefficients	Sig.
		B	Std. Error	Beta	
1	(Constant)	-2.526	3.535		.714
	Kredit Macet (NPL)	-.139	.385	-.162	.725
	Likuiditas (LDR)	.002	.037	.024	.954
	Pendapatan Bunga Bersih (NIM)	.720	.225	.816	.011

a. Dependent Variable: Rentabilitas Keuangan (ROA)

Source: Output SPSS 25

Based on the results of the (Partial) T-test in Table 9, the following conclusions can be drawn:

1. The calculated t-value for the Non Performing Loans (NPL) variable is -0.362 with a significance value of 0.725 (> 0.05), while the critical t-value at a significance level of 0.05 (5%) is 2.26216. From these results, the t-calculated value is less than the t-table value, $-0.362 < 2.26216$, and the significance value of 0.725 is greater than 0.05; therefore, H1 is rejected. Thus, the conclusion is that there is no significant effect on Return on Assets (ROA).
2. The calculated t-value for the Liquidity (LDR) variable is 0.059 with a significance value of 0.954 (> 0.05), while the critical t-value at a significance level of 0.05 (5%) is 2.26216. Based on these results, the calculated t-value is less than the critical t-value, $0.059 < 2.26216$, and the significance value of 0.954 is greater than 0.05; therefore, H2 is rejected. Thus, the conclusion is that there is no significant effect on Return on Assets (ROA).
3. The calculated t-value for the Net Interest Margin (NIM) variable is 3.196 with a significance value of 0.011 (< 0.05), while the critical t-value at a significance level of 0.05 (5%) is 2.26216. Based on these results, the calculated t-value is greater than the critical t-value ($3.196 >$

2.26216), and the significance value of 0.011 is less than 0.05; therefore, H3 is accepted. Thus, the conclusion is that there is a significant effect on Return on Assets (ROA).

Hypothesis	T Count	T Table	Sig	Decision
H1: NPL has an effect on ROA	-0.362	2.262	0.758	Rejected
H2: LDR has an effect on ROA	0.059	2.262	0.937	Rejected
H3: NIM has an effect on ROA	3.196	2.262	0.013	Accepted

Simultaneous Test (F-test)

Table 10. Simultaneous Test (F test) Result

ANOVA ^a						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	2.354	3	.785	4.124	.043 ^b
	Residual	1.712	9	.190		
	Total	4.067	12			

a. Dependent Variable: Rentabilitas Keuangan (ROA)

b. Predictors: (Constant), Pendapatan Bunga Bersih (NIM), Likuiditas (LDR), Kredit Macet (NPL)

Source: Output SPSS 25

Based on the results in Table 10 it is found that the calculated F-value is 4.124 with a significance value of 0.043, while the critical F-value is 3.86. Given these results, the calculated F-value is greater than the critical F-value ($4.124 > 3.86$), and the significance level of 0.043 is less than 0.05 therefore, H4 is accepted. This indicates that the independent variables Non Performing Loans (NPL), Liquidity (LDR), and Net Interest Margin (NIM) collectively influence Return on Assets (ROA).

Hypothesis	F Count	F Table	Sig	Decision
H4: NPL, LDR, and NIM simultaneously affect ROA	4.124	3.86	0.043	Accepted

Coefficient of Determination (R²) Test

Table 11. Coefficient of Determination (R²) Test Result

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.761 ^a	.579	.439	.43619	1.1225

a. Predictors: (Constant), Pendapatan Bunga Bersih (NIM), Likuiditas (LDR), Kredit Macet (NPL)

b. Dependent Variable: Rentabilitas Keuangan (ROA)

Source: Output SPSS 25

Based on Table 11, the R-squared value is 0.579. This indicates that the independent variables Non-Performing Loans (NPL), Liquidity (LDR), and Net Interest Margin (NIM) are

able to explain 57.9% of the variation in the dependent variable, Return on Assets (ROA), while the remaining 42.1% is explained by other variables outside the scope of this study. The Adjusted R-Square value of 0.439 indicates that the model's ability to explain the dependent variable is 56.1%. This suggests that the regression model in this study is quite effective in explaining the variation in Return on Assets (ROA).

The Effect of Non-Performing Loans (NPL) on Return on Assets (ROA)

Based on the research findings, the Non Performing Loans (NPL) variable does not have a significant effect on Return on Assets (ROA). The calculated t-value for the Non Performing Loans (NPL) variable is -0.362, and the significance level is 0.752. Therefore, by comparing the calculated t-value to the critical t-value namely $-0.362 < 2.26216$ and noting that the significance level of 0.752 is greater than 0.05, H1 is rejected. Thus, Non Performing Loans (NPL) do not have a significant partial effect on Return on Asset (ROA). This is consistent with the research conducted by Kessek et al., (2024), Anita & Priyanto (2025), and Naditiya & Permada (2025). The insignificant relationship also indicates that PT Bank Rakyat Indonesia (Persero) Tbk maintained effective credit quality management throughout the observation period, allowing the bank to preserve stable financial performance despite changes in non-performing loans.

Theoretical Interpretation:

This result aligns with the Financial Intermediation Theory, bank perform their intermediary function by efficiently channeling funds collected from depositors into productive lending activities while maintaining the quality of their loan portofolio. Effective intermediation enables banks to sustain profitability even when fluctuations in non performing loans occur, provided that overall credit management remains effective.

In the banking sector, information reflected in financial ratios such as Non Performing Loan (NPL) and Return on Assets (ROA) can serve as signals for investors and stakeholders in assessing a bank condition and prospects. This finding differs from previous studies that found a significant effect of NPL on ROA. This difference may be attributed to differences in the research period, research object, and external economic conditions during the observation period. The insignificant relationship also indicates that PT Bank Rakyat Indonesia (Persero) Tbk maintained effective credit quality management throughout the observation period, allowing the bank to preserve stable financial performance despite changes in non-performing loans.

The Effect of Liquidity (LDR) on Return on Asset (ROA)

Based on the research results, the Liquidity (LDR) variable does not have a significant effect on Return on Assets (ROA). The calculated t-value for the liquidity (LDR) variable is 0.059, and the significance level is 0.954. Therefore, by comparing the calculated t-value to the critical t-value that is, $0.059 < 2.26216$ and noting that the significance level of 0.954 is greater than 0.05, H2 is rejected. Thus, liquidity (LDR) does not have a significant partial effect on Return on Assets (ROA). This is consistent with the research conducted by Azzahra & Fadli (2024), Tanaya & Widodo (2024), Aditriana & Budi (2025) and Shalihah & Watiningsih (2025).

Theoretical Interpretation:

This finding can be explained by Financial Intermediation Theory, which views banks as financial intermediaries responsible for collecting funds from surplus units and channeling them to deficit units through lending activities. The liquidity (LDR) reflects the effectiveness of banks in performing this intermediary function. However, a higher or lower Liquidity (LDR) does not necessarily result in changes in profitability, as the bank financial performance is also influenced by the quality of loan distribution, funding costs, and the efficiency of asset utilization. Therefore, variations in Liquidity (LDR) alone were insufficient to significantly affect Return on Assets (ROA) during the observation period.

The insignificant relationship indicates that PT Bank Rakyat Indonesia (Persero) Tbk was able to maintain its intermediary function effectively by balancing loan distribution and liquidity management. The difference in findings may be related to changes in external economic conditions and the bank lending and funding strategies during the observation period. Consequently, fluctuations in the LDR ratio did not materially influence the bank ability to generate profits during the study period.

The Effect of Net Interest Margin (NIM) on Return on Assets (ROA)

Based on the research results, the Net Interest Margin (NIM) variable has a significant effect on Return on Assets (ROA). This can be seen from the calculated t-value being greater than the critical t-value and the significance level being less than 0.05. The calculated t-value for the Net Interest Margin (NIM) variable is 3.196, and the significance level is 0.011. Therefore, by comparing the calculated t-value to the critical t-value where $3.196 > 2.26216$ and the significance level $0.011 < 0.05$, H3 is accepted. Thus, Net Interest Margin (NIM) has a partial effect on Return on Assets (ROA). This is consistent with the research conducted by Natanael & Mayangsari (2022), Lestari & Setianegara (2020), and Sanny & Dewi (2020).

Theoretical Interpretation:

These results are consistent with Ross Signaling Theory (1977). The Net Interest Margin used to assess a bank managements ability to manage earning assets in order to generate net income. This ratio is essential for bank management, as it helps minimize the risk of banks facing problems. This information can serve as a positive signal to investors regarding the company's performance. This result is consistent with studies showing that NIM has a significant effect on ROA, indicating that the ability to generate net interest income remains an important factor in determining bank profitability. Net Interest Margin (NIM) influences Return on Assets (ROA). Management, as the party with more comprehensive information about the company's condition, seeks to send signals to investors through various actions and policies that reflect the company's prospects and performance. Therefore, improving the efficiency of earning asset management and optimizing interest income generation are essential for enhancing the bank's financial performance.

The Effect of Non-Performing Loans (NPL), Liquidity (LDR), and Net Interest Margin (NIM) on Return on Assets (ROA)

Based on the research results, the variables NonPerforming Loans (NPL), Liquidity (LDR), and Net Interest Margin (NIM) have a significant effect on Return on Assets (ROA). This can be seen from the calculated F-value being greater than the table F-value and the

significance level being less than 0.05. The calculated F-value is 4.124, and the significance level is 0.043. Given these results, the calculated F-value is greater than the critical F-value ($4.124 > 3.86$), and the significance level (0.043) is less than 0.05 therefore, H4 is accepted. Thus, Non Performing Loans (NPL), Liquidity (LDR), and Net Interest Margin (NIM) have a significant effect on Return on Assets (ROA). This is consistent with the research conducted by Ramadanti & Setyowati (2022) and Soviani et, al (2022).

Theoretical Interpretation:

The results of this study are consistent with financial intermediation theory, which explains that profits are generated through the combined effects of credit quality management, the effectiveness of fund allocation, and the ability to generate interest income. The combination of the NPL, LDR, and NIM variables can explain financial profitability, as reflected by return on assets (ROA). The simultaneous effect indicates that NPL, LDR, and NIM collectively contribute to variations in ROA, although their individual effects differ. These findings are consistent with Risk Management Theory, which explains that banks are required to identify, measure, monitor, and control various risks arising from their business activities in an integrated manner. Effective risk management enables banks to maintain financial stability while optimizing profitability through balanced credit risk management, liquidity management, and the performance of income-generating assets. Therefore, the simultaneous influence of NPL, LDR, and NIM on ROA indicates that these financial indicators collectively contribute to the overall financial performance of PT Bank Rakyat Indonesia (Persero) Tbk.

CONCLUSION

This study examined the effects of Non Performing Loans (NPL), Liquidity (LDR), and Net Interest Margin (NIM) on Return on Assets (ROA) at PT Bank Rakyat Indonesia (Persero) Tbk during the 2013-2025 period. The findings indicate that Non-Performing Loans (NPL) and Liquidity (LDR) do not have significant partial effects on Return on Assets (ROA), whereas Net Interest Margin (NIM) has a positive and significant effect on Return on Assets (ROA). Furthermore, the simultaneous test demonstrates that NPL, LDR, and NIM collectively have a significant effect on ROA. These findings suggest that although credit quality and liquidity, when considered individually, do not significantly influence profitability, the bank ability to generate net interest income plays a crucial role in improving financial performance. Overall, the combined management of credit quality, liquidity, and interest income contributes significantly to enhancing the profitability of PT Bank Rakyat Indonesia (Persero) Tbk.

The specific contribution of this study lies in providing empirical evidence from Indonesia's largest state owned bank observation period 2013-2025, covering the dynamics before, during, and after the COVID-19 pandemic. This extended observation period provides a broader perspective on the relationship between NPL, LDR, NIM, and ROA across different economic conditions. The findings of this study provide practical implications for bank management in maintaining sustainable profitability. Although NPL and LDR do not individually have a significant effect on ROA, bank should continue to maintain prudent credit management and optimal liquidity to support financial stability. In addition, improving the efficiency of earning asset management to increase Net Interest Margin (NIM) should remain a strategic priority, as it has been shown to contribute significantly to profitability. Therefore, an integrated approach to managing credit quality, liquidity, and interest income is essential for strengthening the bank financial performance and ensuring long term business sustainability.

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