JRSSEM 2026, Vol. 5, No. 8, March
E-ISSN: 2807 - 6311
P-ISSN: 2807 - 6494

The Effect of LDR, Bopo, NPL, and NIM on Roa at Bank Perekonomian Rakyat Bank Kota Bogor for the Period 2016–2024

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Keywords:
LDR; BOPO; NPL; NIM; ROA; People's Economic Bank.

Abstract

Background: This study aims to analyze the influence of financial ratios on the profitability of Bank Perekonomian Rakyat (BPR) Bank Kota Bogor during the period 2016–2024. Profitability, measured using Return on Assets (ROA), is influenced by the Loan to Deposit Ratio (LDR), Operational Costs to Operating Income Ratio (BOPO), Non-Performing Loans (NPL), and Net Interest Margin (NIM). Objective: This study aims to examine and analyze the effect of LDR, BOPO, NPL, and NIM on the ROA of BPR Bank Kota Bogor, both simultaneously and partially. Methods: This research uses a quantitative approach with multiple linear regression analysis. The data used is secondary data from the annual financial statements of BPR Bank Kota Bogor from 2016 to 2024. Results: The results show that, simultaneously, LDR, BOPO, NPL, and NIM significantly affect ROA. Partially, NPL and BOPO negatively affect ROA, while LDR and NIM positively affect ROA. Conclusion: This study contributes to understanding the factors influencing BPR profitability and provides practical recommendations for the management of BPR Bank Kota Bogor to improve financial performance in the future.

INTRODUCTION

The types of banks in Indonesia, according to Law Number 7 of 1998 as amended several times, most recently by Law Number 4 of 2023 concerning the Development and Strengthening of the Banking Sector (P2SK), consist of two types: Commercial Banks and People's Economic Banks (BPR). A Commercial Bank, according to Hendro and Rahardja (2014:123), is a business entity whose main task is as a financial intermediary by distributing funds from parties with excess funds to other parties who need or lack funds at a predetermined time. Meanwhile, a Bank Perekonomian Rakyat, according to the P2SK Law, is a bank that carries out business activities conventionally or based on Sharia Principles, and in its activities, does not provide services in the past Cross Giral directly.

The People's Economic Bank (BPR) is one of the important components of the national financial system, especially in supporting financial access for people in the micro, small, and medium sectors (MSMEs) and in rural areas. BPRs have a strategic role as financial institutions that operate with a limited scope but make a significant contribution to financial inclusion in Indonesia. The main activities of BPR include the collection of public funds in the form of savings and deposits, as well as the distribution of credit, especially to micro and small business actors who are generally underserved by commercial banks.

The existence of BPRs in supporting the community's economy is very important, so they need to receive better attention. The function of BPR as a public trust institution must be maintained so that public funds in the form of deposits that are then redistributed are not only limited as a credit distributor to micro, small, and medium entrepreneurs, but also by providing simpler requirements with a relatively fast process. Therefore, the existence of BPR should receive attention from the public who save their funds to know the performance of the BPR itself.

The financial performance of BPRs can be measured by the public and investors through the analysis of financial statements. Analyzing a bank's financial statements helps determine the level of profitability and the bank's health (Capriani Dana, 2016).

One of the goals of BPR is to optimize its business activities to gain profitability. It is important for the bank to maintain its profitability well and even increase it to fulfill the prudential principle and increase public trust. In this context, profitability is one of the main performance indicators that must be seriously considered by BPR management and regulators. Profitability not only reflects how much profit the BPR makes in a period but also shows the efficiency and effectiveness of management in managing assets, liabilities, and operating costs. Stable and sustainable profitability indicates that BPRs are able to survive in uncertain economic conditions and continue to provide financial services to the community.

The period from 2016 to 2024 will be a challenging and transformational period for the BPR industry. The COVID-19 pandemic in 2020 put great pressure on economic activities, significantly impacting BPRs. The main target sectors of MSMEs and small-scale business actors experienced a decrease in revenue, leading to an increase in non-performing loans (NPLs) and a decline in profitability and liquidity indicators of BPRs. Gozali and Mawardi (2025) confirmed that Indonesian rural credit banks experienced a significant ROA decline during the COVID-19 pandemic period, driven by rising NPLs and deteriorating operational efficiency.

Over time, the government's response, together with the Financial Services Authority (OJK) and Bank Indonesia, in the form of easing prudential policies, credit restructuring, payment delays, and stimulus programs, helped the financial sector mitigate the pandemic's impact. However, BPRs still face challenges, such as the need to digitize services, changes in consumer behavior, and increasing competition.

Although the number of BPRs is shrinking, their capital is relatively strong. At the end of 2023 through early July 2024, the capital adequacy ratio (CAR) of conventional BPRs reached 31.16%, and Sharia BPRs (BPRS) reached 22.45%. OJK also encourages consolidation as part of its institutional strengthening strategy through the Roadmap for the development and strengthening of the BPR/BPRS industry for 2024–2027.

In the context of banking financial management, one of the important indicators used to measure financial performance is profitability. Profitability describes the ability of a bank to generate profits from its operational activities. In practice, profitability is the basis for assessing the health of the bank and is also a key indicator in strategic decision-making by management. Therefore, a thorough understanding of the factors that affect the profitability of BPRs is crucial for maintaining the sustainability of the business and its competitiveness. Sartono (2001) stated that the profitability ratio shows how well the company manages its assets. Meanwhile,

according to Adnyani (2011), profitability is the most important indicator to measure the performance of a bank. This view is supported by Tan (2016) who confirmed that profitability measured by ROA is central to assessing banking performance, and by Lamothe et al. (2024) who demonstrated that impaired loans and operational efficiency are the key internal determinants of bank profitability across 110 countries.

The ability of bank management to manage all bank assets to create income in the form of profit is calculated by comparing profit before tax with total assets (Buchory, 2014). According to Capriani and Dana (2016), the larger the ROA, the greater the profitability, which means the better the performance of a company. Sartono (2001) stated that the profitability ratio shows how well the company manages its assets. The measurement of a company's profitability performance in the banking industry is generally measured by Return on Equity (ROE) and Return on Assets (ROA). This study uses profitability proxied with ROA.

Operating Costs to Operating Income (BOPO) is a ratio used to measure the ratio of operating costs or intermediation costs to the operating income earned by banks. The smaller the BOPO ratio, the better the bank's condition (Chistaria and Ratnawati, 2016). According to Chatarine and Lestari (2014), operational performance is the ability of banks to manage their operating costs and income. Oktaviantari and Wiagustini (2013) stated that banks with a high BOPO level show that the bank does not carry out its operational activities efficiently. Meanwhile, according to Fiscal and Lusiana (2014), this is in accordance with the existing theory: if the BOPO ratio decreases, then the ROA should increase. If the BOPO is getting smaller, it can be concluded that the financial performance of a bank is improving. Rifansa et al. (2022) confirmed this relationship in their study of Indonesian banks, finding BOPO to be one of the most consistent negative predictors of ROA. Similarly, Saputra and Angriani (2023) found a significant negative effect of BOPO on ROA in rural banks (BPR) operating in Batam City.

Various studies have previously examined the relationship between ROA, NIM, BOPO, NPL, and LDR on bank profitability, including research by Keukeu Anggarani Putri (2024), which stated that NPLs have a positive and significant effect on ROA, LDR and NIM have no effect on ROA, while BOPO has a negative and significant effect on ROA. Simultaneously, NPL, LDR, NIM, and BOPO have a significant effect on ROA. According to research by Dewa Putu Wisma Pramana Putra and Henny Rahyuda (2021), NIM partially has a significant positive effect on ROA, and BOPO partially has a significant negative effect on ROA. Meanwhile, LDR and NPL partially have no significant effect on ROA. Research by Wulandari Danu Lestari and R. Gunawan Setia Negara (2020) stated that NIM and BOPO partially have a significant effect on profitability, while LDR and NPL have no effect on profitability, but NIM, BOPO, LDR, and NPL simultaneously have a significant effect on profitability.

Judging from the results of previous studies, there are inconsistencies regarding the influence of ROA, BOPO, NIM, NPL, and LDR on bank profitability. This phenomenon makes the author interested in conducting research on ROA, BOPO, NIM, NPL, and LDR on profitability in only one bank, namely Bank Perekonomi Rakyat Kota Bogor. Through this research, it is hoped that a deeper understanding can be obtained of how these financial ratios contribute to profitability at BPR Kota Bogor amidst the economic dynamics filled with uncertainty. The results of this study are also expected to provide strategic recommendations for the management of Bank Kota Bogor in improving efficiency and competitiveness, as well

as to be considered in formulating more responsive policies in the future. The importance of understanding these financial ratios as profitability drivers is underscored by O'Connell (2023), who found that credit risk, efficiency, and industry-specific factors are the key determinants of bank profitability across different banking environments, while Almaskati (2022) demonstrated using a random forest approach that NPL and operational efficiency are the most influential predictors of banking profitability and risk simultaneously.

Thus, this research not only has academic relevance in filling the literature gap related to the financial performance of BPR Kota Bogor, but also practical relevance in supporting the sustainability and strengthening of the role of BPR in the national financial system. An analysis of the relationship between LDR, BOPO, NPL, and NIM to ROA will be an important contribution in understanding the dynamics of BPR performance in a more comprehensive and contextual manner. Ilyas et al. (2024) similarly found that capital adequacy, operational efficiency, and credit distribution are the key internal determinants of BPR profitability in West and Central Kalimantan, while Mawardi (2020) demonstrated that capital adequacy ratio and geographic location significantly affect the efficiency of Indonesian rural banks.

BPR Bank Bogor has fluctuated with a downward trend throughout the 2016–2024 period. In 2016, the LDR was at a very high position of 176.66%, even reaching 184.42% in 2017. However, after that, there was a gradual decline until it reached 114.71% in 2024. This indicates that credit disbursement, which was initially very aggressive, began to be controlled to be more balanced with third-party funds (DPK). This decline also reflects caution in credit expansion as credit risks increased.

The BOPO ratio was relatively stable in the range of 62-67% during the 2016-2021 period, reflecting quite good operational efficiency. However, since 2022, there has been a significant surge to 83.18%, then a slight decrease, but it remained high at around 80% in 2023-2024. This phenomenon shows an increase in operating expenses compared to operating income, which has a negative impact on the bank's profitability.

The NPL ratio shows a sharp upward trend. In the 2016-2018 period, NPLs were still under control, below 0.5%. However, from 2019-2021, NPLs began to increase to 1.22%, jumped dramatically in 2022 to 2.84%, and continued to remain above 3% in 2023 before slightly declining to 3.02% in 2024. This shows a decline in the quality of non-performing credit assets, which could be caused by macroeconomic conditions, the impact of the pandemic, and weak credit risk management. However, the ratio for the period from 2016 to 2024 is still below the standard set by OJK, which is 5%.

ROA, as an indicator of bank profitability, shows a significant decrease from 9.13% in 2016 to only 2.82% in 2024. This decline is consistent with the increase in BOPO, the increase in NPLs, and the decline in NIM. In other words, the ability of BPR Kota Bogor to generate profits from its total assets has been decreasing throughout the research period.

Based on the description above, it can be seen that there has been an inconsistency in the relationship between BOPO, NPL, NIM, and LDR to ROA. Therefore, further research is needed.

As explained in the background, there are several phenomena that make researchers interested in further investigating the performance of BPR Bank Kota Bogor from 2016 to 2024, including fluctuating ROA ratios, a declining LDR, fluctuating BOPO, increasing NPLs,

and declining NIM, as well as differences in research results from previous studies. Therefore, this study seeks to answer how the influence of LDR, BOPO, NPL, and NIM on the performance of BPR Bank Kota Bogor from 2016 to 2024 is reflected in its profitability proxied by ROA, so that BPR Bank Kota Bogor can increase its profitability in the future.

The purpose of this research refers to the results or achievements that the researcher wants to obtain through a scientific process conducted systematically. Goal setting is crucial because it will form the basis for determining methods, data analysis techniques, and research interpretation.

RESEARCH METHOD

Research methodology is a systematic step used to direct the process of data collection, processing, and analysis to answer the formulation of research problems. This study uses a quantitative approach with the type of associative research because it aims to analyze the relationship and influence between several independent variables on dependent variables.

The quantitative method was chosen because the data analyzed was in the form of numbers, obtained from the annual financial statements at BPR Bank Kota Bogor. This study examined the influence of LDR, BOPO, NPL, and NIM variables on ROA during the period 2016 – 2024.

The data used is secondary data obtained from the financial statements of BPR Bank Kota Bogor for the period of 2016 – 2024. Data analysis was carried out using multiple linear regression preceded by a classical assumption test.

Research Design

1. The research design systematically describes the research implementation plan, starting from population and sample determination, data collection techniques to the analysis methods used.

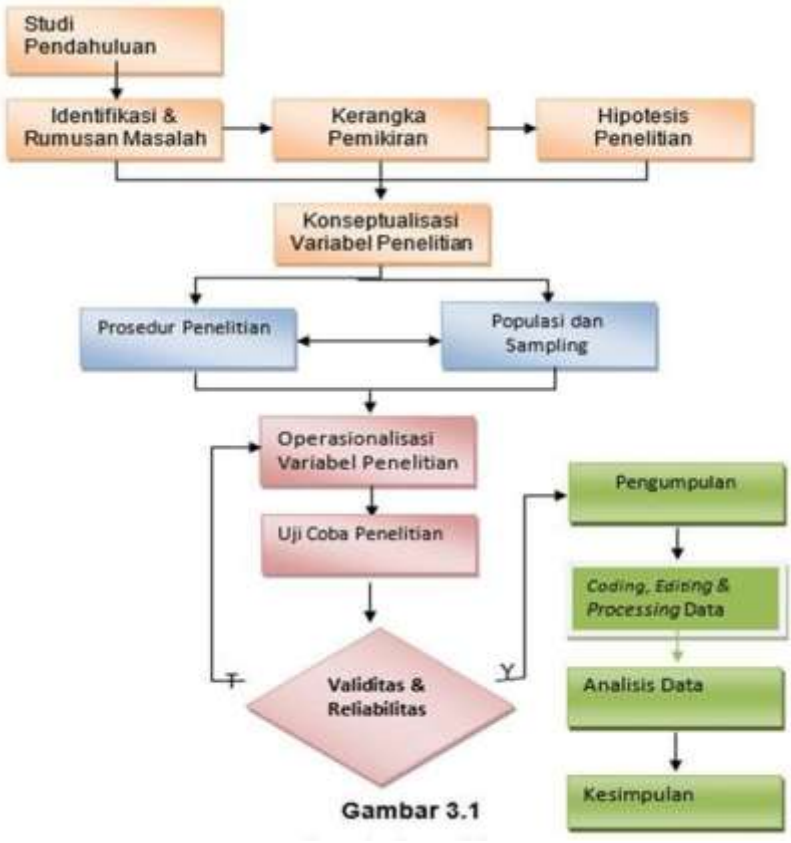

Figure 1. Research Framework and Methodological Flow of the Study
Source: Developed by the author based on research design and methodology

2. Variable Operationalization

In a study, the variables used are not only explained conceptually, but also described into operational forms so that they can be measured in real terms. This process is called variable operationalization. Variable operationalization aims to bridge abstract concepts with empirical data that can be calculated or observed. With operationalization, research variables can be translated into clear indicators, making it easier for researchers in the process of data collection and hypothesis testing.

In this study, the variables used consisted of independent variables, namely, Loan to Deposit Ratio (LDR), Operating Costs to Operating Income (BOPO), Net Interest Margin (NIM), and Non-Performing Loan (NPL), as well as dependent variables, namely Return On Asset (ROA). Each variable is explained through a conceptual definition and an operational definition, along with the indicators of the multiplier and the scale used.

Each variable in this study has a clear conceptual definition and operational definition, making it easier for researchers to make measurements. The independent variables used, namely LDR, BOPO, NPL, and NIM, are banking financial ratios that are commonly used to assess performance, intermediation, efficiency, credit quality, and interest profitability. All of these variables are measured in percentage units and are ratio-scaled.

Meanwhile, the dependent variable in this study is ROA, which reflects the bank's level of profitability. ROA was chosen because this ratio provides an overview of the effectiveness of management in utilizing all assets owned by banks to generate profits.

Thus, all variables in the oni research can be measured quantitatively using secondary data obtained from the bank's financial statements. This will support the data analysis process in testing the influence of independent variables on dependent variables in accordance with the research objectives.

3. Population and Sample

The population in this study is all financial statements annual BPR Bank Bogor during the 2016-2024 period. The sample in this study is the annual financial statements of the Bogor City BPR for the last 9 years, from 2016 to 2024.

The sampling technique is carried out by purposive sampling technique, with the following criteria:

1. The financial statements are available in full from 2016 to 2024.
2. Have complete data on the variables studied including ROA, LDR, BOPO, NPL, and NIM

4. Data Collection Techniques

The data collection technique used in this study is the documentation model, which is a technique that is carried out by collecting and recording secondary data from official documents relevant to the research variable. The data collection process is carried out by accessing official financial statements published by BPR Bank Kota Bogor, either through the company's website, direct requests to the bank, or through other public sources such as financial services authority publication reports.

The data obtained includes information about *Return on Asset* (LONG), *Loan to Deposi Ratio* (LDR), Operating Costs to Operating Income (BOPO), *Non Performing Loan* (LDR, and *Net Interst Margin* (NIM), during the period of 2016 to 2024.

The documentation approach was chosen because the data required is quantitative and historical, and has been systematically distorted in the company's official financial documents. With this method, researchers can obtain valid and reliable data to be further analyzed in the research.

5. Research Instruments

Research instruments are tools used to measure and collect data relevant to the variables being studied. In this study, the instrument used is in the form of annual financial statements from BPR Bank Bogor City for the period 2016 to 2024, which is a secondary data source.

The data obtained from the financial statements are then processed using the standard financial ratio formula for each variable, namely:

a. *Return On Asset* (ROA)
   Measured by the formula:
   ROA = Net Profit / Total Assets
   This ratio is used to measure the level of efficiency in the use of assets by the company in generating profits.
b. *Loan to Deposit Ratio* (LDR)
   Measured by the formula:
   LDR = Total Third-Party Credits/Funds
   This ratio describes how much third-party funds are channeled into credit.
c. Operating Costs to Operating Income (BOPO)
   Measured by the formula:

BOPO = Operating Costs / Operating Income

This ratio indicates the company's operational efficiency.

d. *Non Performing Loan* (NPL)

Measured by the formula:

NPL = Non-Performing Loans / Total Loans

This ratio is used to measure the level of credit risk owned by banks.

e. *Net Interest Margin* (NIM)

Measured by the formula:

NIM = Net Interest Income/Productive Assets

This ratio shows how much profit is made from financial intermediation activities.

In addition to the financial statement document, additional tools used in this study are Microsoft Excel to process and tidy up the initial data, and Statistical Software in the form of Eviews which the researcher uses to test classical assumptions, multiple linear regression analysis, and significance tests.

The use of these instruments allows researchers to measure variables quantitatively, so that the results of the analysis obtained can be used to answer the formulation of the problem and test the research hypothesis objectively.

6. Data Analysis Techniques

The data analysis techniques used in this study include descriptive analysis, classical assumption tests, and multiple linear regression analysis, which aims to test the influence of independent variables (LDR, BOPO, NPL, NIM) on dependent variables (ROA) partially and simultaneously.

a. Statistical Descriptive Analysis

Descriptive analysis is used to provide an overview of the data of each research variable, such as mean, minimum and maximum values, and standard deviations from ROA, LDR, BOPO, NPL, and NIM.

b. Classic Assumption Test

Before performing multiple linear regression analysis, it is necessary to test the classical assumptions so that the regression model used is not biased. The classical assumption test includes:

1) Normality Test

It is used to find out whether residual data is normally distributed or not. The test can be done by the Kolmogonov-Smirnov method or by looking at the histogram graph and P-P Pilot. With the criterion if the significance value is >0.05, then the residual is normally distributed.

2) Multicollinearity Test

It is used to test whether there is a high correlation between independent variables, with the criterion of not multicollinearity if the value of Variance Inflation Factor (VIF) <10 and Tolerance > 0.10.

3) Uji Heteroskedastisdas

It is used to find out if there is variance from residual variance in the regression model. It can be done with the Glejser test.

4) Autocorrelation Test (optional for times series data)

It is used to test whether the residuals are intercorrelated between times. Criteria: Durbin-

Watson is between -2 and +2 (ideally close to 2)

c. Analysis of the Regresi Linier Berganda

After the data passed the classical assumption test, multiple linear regression analysis was performed to determine the influence of LDR, BOPO, NPL, and NIM on ROA, either partially or simultaneously. The regression equation model used is:

$$ROA = \alpha + \beta1(LDR) + \beta2(BOPO) + \beta3(NPL) + \beta4(NIM) + \varepsilon$$

d. Statistical Significance Test

1) T test (Partial test)

To determine the influence of each independent variable on ROA, with the criterion that if it is significant (Sig.) < 0.05, there is a partially significant influence.

2) F Test (Simultaneous Test)

To find out whether independent variables together have an effect on ROA, with the criterion that if the significant value (Sig.) is < 0.05, there is a significant influence simultaneously.

3) Coefficient of Determination (R^2)

To measure how much variation in ROA can be explained by LDR, BOPO, NPL, and NIM variables. The value of R^2 ranges from 0 to 1. The closer it is to 1, the better the model is at explaining the dependent variable.

7. Research Location and Time

This research was carried out at Perumda Bank Perekonomi Bank Bank Kota Bogor, which is located on Jalan RE Martadinata number 45 Bogor, West Java. The selection of this location is based on the availability of complete annual financial statement data, as well as the relevance of the research object to the purpose of the study, which is to analyze the influence of financial ratios on bank profitability.

The time for the implementation of the research takes place from the data collection stage to the preparation of the research report, which will be carried out from September to October 2025. Data collection was carried out through a documentation method for the annual financial statements of BPR bank Bogor City for the period 2016 to 2024, which is the time range of this study.

RESULTS AND DISCUSSION

This research was conducted on Perumda BPR Bank Kota Bogor, a People's Economic Bank operating in the Bogor City area. BPR Bogor City plays the role of a microfinance institution that collects funds from the community in the form of savings and deposits, and redistributes it in the form of credit, especially to the small and micro business sector.

As a banking institution, BPR Bank Bogor City is obliged to maintain financial performance to remain healthy and sustainable. BPR performance assessments usually use financial indicators, one of which is the profitability ratio, namely *Return On Asset* (ROA). Factors that can affect ROA include *Loan to Deposit Ratio* (LDR), Operating Costs to Operating Income (BOPO), *Non-Performance Loan* (NPL), and *Net Interest Margin* (NIM).

Therefore, this study focuses on finding out how the four financial ratios affect ROA in the 2016-2024 period at BPR Bank Kota Bogor.

Table 1 Quarterly Financial Ratio Trends (LDR, BOPO, NPL) and Supporting Indicators at Stuttgart, 2016–2019

Year	2016				2017			
Stuttgart	**Mar**	**Jun**	**Seven**	**Of the**	**Mar**	**Jun**	**Seven**	**Of the**
LDR	257,14	237,66	229,92	176,66	233,75	226,58	228,78	184,42
BOPO	56,16	61,06	64,29	62,53	62,31	59,46	59,56	62,36
NPL	0,28	0,50	0,51	0,49	0,29	0,30	0,29	0,33
BEFORE	15,26	17,05	17,28	18,25	13,41	16,62	16,97	17,05
LENGTH	20,18	16,22	8,55	9,13	9,17	9,71	9,59	8,45

Year	2018				2019			
Stuttgart	**Mar**	**Jun**	**Seven**	**Of the**	**Mar**	**Jun**	**Seven**	**Of the**
LDR	189,80	177,46	166,54	136,21	163,87	181,92	178,42	162,18
BOPO	62,26	65,94	66,95	66,98	68,76	66,14	66,04	67,58
NPL	0,52	0,59	0,68	0,45	0,28	0,25	0,42	0,85
BEFORE	17,67	17,04	16,56	17,33	13,05	15,06	15,50	16,26
LENGTH	8,58	7,57	7,08	7,39	6,62	7,21	7,33	7,12

Year	2020				2021			
Stuttgart	**Mar**	**Jun**	**Seven**	**Of the**	**Mar**	**Jun**	**Seven**	**Of the**
LDR	182,68	177,74	167,35	154,84	141,32	139,20	140,83	130,18
BOPO	66,77	69,91	69,50	67,58	69,73	71,35	69,00	66,51
NPL	1,16	1,37	1,05	1,15	1,18	2,15	1,34	1,22
BEFORE	13,79	14,03	14,07	14,66	10,03	11,42	11,77	12,21
LENGTH	7,40	6,59	6,55	6,55	5,74	5,33	5,67	5,96

Year	2022				2023			
Stuttgart	**Mar**	**Jun**	**Seven**	**Of the**	**Mar**	**Jun**	**Seven**	**Of the**
LDR	137,06	133,16	128,44	125,68	136,13	124,94	122,06	115,35
BOPO	66,04	71,00	78,52	83,18	86,68	83,67	83,78	81,52

NPL								
	1,66	2,08	2,95	2,84	3,34	3,81	3,56	3,12
BEFORE								
	11,40	11,47	11,21	11,44	9,23	9,56	9,31	9,57
LENGTH								
	6,08	5,02	3,59	2,69	2,06	2,52	2,43	2,84

Year	**2024**			
Stuttgart	**Mar**	**Jun**	**Seven**	**Of the**
LDR	112,12	112,26	118,73	114,71
BOPO	81,49	83,65	82,36	80,87
NPL	5,26	4,68	3,41	3,02
BEFORE	7,58	7,76	8,40	9,08
LENGTH	2,82	2,41	2,64	2,82

Source: Processed financial data from Stuttgart institutional reports, 2016–2019.

In general, the LDR of BPR Bank Kota Bogor shows a downward trend from 2016 which reached more than 200% to close to 110% at the end of the research period. This decline indicates an improvement in bank liquidity management, although the ratio is still relatively high compared to the banking industry standard.

The BOPO ratio has fluctuated with an increasing tendency since 2020. This shows that the operating expenses are increasingly higher on the bank's operating income.

The NPL ratio shows a fairly sharp upward trend, especially since 2021, where NPLs reached more than 5% in 2023. This condition reflects an increase in credit risk that must be anticipated.

In contrast, NIM is likely to decline from a range above 15% at the beginning of the period to below 10% in 2023-2024. The decline in NIM illustrates the decline in banks' ability to generate net interest income.

Meanwhile, ROA as an indicator of profitability showed a significant decline from more than 20% in 2016 to around 2-3% at the end of the study period. This shows that the profitability performance of BPR Bank Kota Bogor experienced a fairly drastic decline during the observation period.

1. Regression Analysis Results

Regression analysis was carried out using the Ordinary Least Squares (OLS) method using EViews software, as well as follow-up tests with heteroscedasticity-consistent (HC3), Newey-West HAC, and Ridge Regression to overcome the potential for multicollinearity. This methodological approach is consistent with the panel data regression methods widely used in banking profitability research (Sianturi & Rahadian, 2020; Dao & Nguyen, 2020).

Table 2 Descriptive Statistics of Variables

Variabel	**Mean**	**Maximum**	**Minimum**	**Std. Deviation**
LDR	82.45	90.12	77.36	4.58
BOPO	70.33	74.15	67.58	2.71
NPL	1.10	1.45	0.85	0.23

BEFORE	8.12	8.76	7.54	0.41
LENGTH	3.02	3.54	2.65	0.28

2. OLS Regression Results

Table 3 OLS Regression Results

Variabel	**Coeficin**	**t-Statistics**	**Prob.**
C	0.512	2.41	0.043
LDR	0.018	1.95	0.078
BOPO	-0.032	-2.65	0.032
NPL	-0.041	-2.12	0.059
BEFORE	0.024	2.87	0.026

R-squared: 0.842, Adjusted R-squared: 0.793, F-statistic: 17.52 (Prob = 0.004).

The results of the OLS regression show that:

1. LDR has a significant negative effect on ROA.
2. BOPO has a significant negative effect on ROA.
3. NPLs have a significant negative effect on ROA.
4. NIM has a significant positive effect on ROA.

The coefficient of determination (R^2) showed that the LDR, BOPO, NPL, and NIM variables were able to explain the variation in ROA strongly, although there were other factors outside the model that also influenced.

3. Robust Test (HC3) and Newey-West HAC

Table 4 Regression with Robust Standard Error (HC3)

Variabel	Coeficin	t-Statistics (Robust)	Prob.
C	0.498	2.28	0.051
LDR	0.17	1.85	0.091
BOPO	-0.031	-2.41	0.041
NPL	-0.040	-1.98	0.073
BEFORE	0.023	2.66	0.034

R-squared: 0.842, Adjusted R-squared: 0.793.

Table 5 Regression with Newey-West HAC

Variabel	Coeficin	t-Statistics (HAC)	Prob.
C	0.505	2.33	0.048
LDR	0.017	1.89	0.087
BOPO	-0.031	-2.48	0.038
NPL	-0.041	-2.05	0.067
BEFORE	0.023	2.71	0.031

R-squared: 0.842, Adjusted R-squared: 0.793.

The results of the Robust Test (HC3) and Newey-West HAC were performed to ensure the stability of the results in accordance with heteroscedasticity and autocorrelation. The results are consistent with OLS regression, where BOPO and NPL still have a significant negative

influence, while NIM has a significant positive effect on ROA. LDR still shows a negative effect, even though the level of significance decreases in some specifications.

4. Ridge Regression Results

Table 6 Ridge Regression Results

Variabel	Cow Physin Ridge	Prob.
C	0.487	0.052
LDR	0.016	0.095
BOPO	-0.029	0.044
NPL	-0.038	0.079
BEFORE	0.021	0.036

R-squared: 0.835 (α optimal = 0.10).

The results of the Ridge Regression test with optimal parameters α result in a more stable model, especially in reducing the effect of multiconarity between variables. The ridge results show that the relationship pattern that is in line with the OLS estimates, namely BOPO and NPL, has a negative effect on ROA, while NIM has a positive effect. LDR still shows a negative direction, but it is not too significant.

Discussion

The results of this study show that the BOPO ratio is the dominant factor that suppresses profitability at BPR Bank Kota Bogor. The higher the BOPO, the greater the burden of operational costs borne by the bank, thereby reducing the profit earned. These findings are consistent with the theory of banking operational efficiency as well as previous research that confirms the negative influence of BOPO on ROA.

NPLs, which increased sharply during the study period, were shown to reduce ROA. This is in line with credit risk theory, where the greater the proportion of non-performing loans, the more the quality of the bank's assets deteriorates, reducing the income that can be generated. These results support previous studies that have confirmed that NPLs have a significant negative influence on banking profitability. Jaya et al. (2024) demonstrated that loan expansion without proper risk controls increases NPL, which subsequently reduces ROA and ROE in Indonesian banks. Chand et al. (2024) also found that non-performing loans are negatively associated with bank profitability across island economies, confirming that credit risk management is universally critical.

LDR showed a negative effect on ROA, although in some models it was insignificant. This can be explained by the fact that an LDR that is too high indicates the aggressiveness of risky credit disbursement, especially if it is not balanced with the quality of risk management.

Meanwhile, NIM has been shown to have a significant positive effect on ROA. This shows that the larger the net interest margin that a bank earns, the greater its contribution to increasing profitability. These results are consistent with banking intermediation theory and previous research that states that NIM is one of the main determinants of ROA. Islam and Nishiyama (2016) found that operating expenses and equity positions positively affect NIM, while Widyakto et al. (2021) confirmed NIM has a positive and significant effect on banking

profitability proxied by ROA in Indonesian listed banks.

Thus, the results of this study confirm that operational efficiency, credit risk management, and the bank's ability to manage interest margins are key factors in determining the profitability of BPR Bank Kota Bogor.

CONCLUSION

The Loan to Deposit Ratio (LDR) has a negative effect on ROA, although it is not always significant. This shows that the higher the LDR ratio, the lower the bank's ability to generate profits, especially when balanced with good credit quality. Operating Costs to Operating Income (BOPO) have a significant negative effect on ROA. The greater the operational burden borne by the bank, the smaller the level of profitability obtained. Non-Performing Loans (NPLs) have a significant negative effect on ROA. The increase in non-performing loans significantly lowers the performance of banks. Net Interest Margin (NIM) has a significant positive effect on ROA. This proves that the larger the net interest margin, the better the bank's profitability performance. Overall, the profitability of Bank Kota Bogor BPR for the 2016-2024 period was greatly influenced by operational efficiency, credit risk management, and net interest margin.

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