



The Effect of Loan to Deposit Ratio (LDR) on Return on Assets (ROA) in Rural Banks in Indonesia

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Abstract

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This study aims to analyze the effect of the Loan to Deposit Ratio on the Return on Assets of Rural Banks (*Bank Perkreditan Rakyat/BPR*) in Indonesia during the period from August 2020 to August 2021. The research employed a quantitative approach using simple linear regression analysis with the SPSS program. The results indicate that Loan to Deposit Ratio has no significant effect on Return on Assets, with a significance value of 0.102 (> 0.05). This finding implies that an increase in credit disbursement ratio does not directly enhance the profitability of rural banks. The coefficient of determination (R^2) of 0.225 indicates that only 22.5% of the variation in Return on Assets is explained by Loan to Deposit Ratio, while the remaining 77.5% is attributable to other factors, such as operational efficiency and credit risk. The study concludes that effective liquidity and risk management play a more crucial role than merely increasing the Loan to Deposit Ratio ratio in maintaining the financial stability and profitability of rural banks.

1. Introduction

Banks have a strategic role in encouraging economic growth through the intermediation function, which is collecting funds from the public and redistributing them in the form of credit. In the context of the People's Credit Bank (BPR), this function is becoming increasingly important because the institution focuses on financing micro, small, and medium enterprises (MSMEs), which are the driving sectors of the national economy. The performance of a BPR in carrying out the function of financial intermediation can be measured through profitability indicators, one of which is Return on Assets (ROA), which shows the bank's ability to generate profits from all assets owned.

One of the factors that affect ROA is the Loan to Deposit Ratio (LDR), which reflects the level of liquidity and the ability of banks to channel third-party funds into productive credit. A high LDR indicates that most of the funds have been disbursed as credit, so the potential for profits increases, but on the other hand it can increase liquidity risk. On the other hand, an LDR that is too low indicates that there is excess liquidity that has not been utilized optimally, which has the potential to reduce the bank's profitability level (Inggawati & Lusy, 2018).

Several previous studies have shown mixed results regarding the relationship between LDR and ROA. For example, research by Winarso and Gunanta (2020) shows that LDR has a negative effect on the performance of BPRs in the city of Bandung, indicating that an increase in credit disbursement is not always followed by an increase in profitability due to the high risk of non-performing loans. On the other hand, Hadian and Phety (2021) found that LDR has a positive effect on ROA

in the general banking sector in Indonesia, which means that increased credit disbursement activities can increase profits. However, different results were found by Tampubolon and Prima (2020), which showed that LDR did not have a significant effect on ROA in BPR in Batam City, due to high operational expenses and the risk of non-performing loans that were not proportional to interest income.

These differences in results show that there is a research gap in the empirical literature regarding the influence of LDR on ROA, especially in the BPR sector. The difference in characteristics between BPRs and commercial banks, both in terms of asset size, funding sources, and customer profiles, indicates that the results of research on commercial banks cannot be directly generalized to BPRs. In addition, most previous studies used data periods before the COVID-19 pandemic, so they have not yet described the condition of BPRs in the midst of economic changes due to the pandemic. Therefore, this study uses data from the period August 2020 to August 2021 to obtain an up-to-date picture of the influence of LDR on ROA after the pandemic period.

During this period, BPRs faced high liquidity pressure due to the increased risk of bad loans in the MSME sector, while credit demand fluctuated. This condition causes BPR LDR ratios to vary significantly between regions. Based on data from the Financial Services Authority (OJK), the average national BPR LDR is in the range of 80%-90%, which indicates that most of the funds have been absorbed as credit. However, the increase in LDR is not always followed by an increase in ROA due to the high impairment loss reserve (CKPN) burden and increased operational costs (Sinaga & Tobing, 2020).

This research is important to re-analyze the relationship between LDR and ROA in BPR by considering post-pandemic conditions and the typical financial structure of micro institutions. By understanding how LDRs affect profitability, BPR management can balance credit disbursement strategies with liquidity risk management. The results of this study are expected to make a theoretical contribution to the microfinance literature and practical benefits for banking policymakers in maintaining the stability and sustainability of BPR operations in Indonesia (Sofyan, 2019).

2. Literature Review

2.1 Loan to Deposit Ratio (LDR)

The Loan to Deposit Ratio (LDR) is the main indicator of banking liquidity that shows the bank's ability to distribute the funds collected to the public in the form of credit. According to Inggawati and Lusy (2018), a high LDR indicates that banks are more aggressive in disbursing credit, which has the potential to increase interest income and profitability. However, excessive LDR increases can reduce liquidity and increase the risk of default if credit quality declines. Research by Winarso and Gunanta (2020) found that the increase in LDR actually had a negative impact on the performance of BPRs in Bandung due to the increased risk of bad loans that suppressed profits. Meanwhile, Miranda (2020) shows that the influence of LDR on profitability can be positive if accompanied by good credit risk management.

Thus, LDR has a dual role in influencing the financial stability of BPRs. This ratio reflects the extent to which public funds are being used efficiently to generate profits, but still demands a balance between credit expansion and liquidity capabilities. In the context of the COVID-19 pandemic, LDR fluctuations are crucial in determining the financial performance of BPRs that serve the high-risk MSME sector.

Hypothesis 1 (H1): Loan to Deposit Ratio (LDR) has a positive effect on Return on Assets (ROA) at People's Credit Banks.

2.2 Return on Assets (ROA)

Return on Assets (ROA) is a measure of the effectiveness of bank management in managing assets to generate profits. According to Hadian and Phety (2021), ROA is the main indicator of profitability that assesses the extent to which all assets owned by banks contribute to net income. In the context of BPR, the ability to generate profits from assets is influenced by the efficiency of credit distribution, control of operational costs, and the quality of the financing portfolio.

Research by Tampubolon and Prima (2020) shows that the profitability of BPRs in Batam City is not optimal due to high operational costs compared to interest income. In addition, Sofyan (2019) found that LDR had a positive effect on ROA, although the effect was not significant due to post-pandemic unstable economic conditions. From these various results, it can be seen that ROA is the result of a combination of intermediation efficiency (through LDR) and operational risk control. Increasing LDR can increase ROA only if the loans disbursed remain of high quality and operational costs are controlled.

Hypothesis 2 (H2): An increase in LDR will increase ROA when accompanied by good risk management and operational efficiency.



Figure.1 Conceptual Framework

The above conceptual framework illustrates the relationship between the independent variable Loan to Deposit Ratio (LDR) and the dependent variable Return on Assets (ROA). Based on the theory of financial intermediation and the results of previous research, it is hypothesized that the higher the LDR (efficiency of disbursement of funds to credit), the higher the ROA, as long as credit and liquidity risk can be managed effectively.

3. Methods

This study uses a quantitative approach with the aim of examining the effect of Loan to Deposit Ratio (LDR) on Return on Assets (ROA) at People's Credit Banks (BPR) in Indonesia. The quantitative approach was chosen because it was able to provide an objective picture of the relationships between variables through statistical testing based on numerical data. With this method, researchers can measure the extent to which changes in LDR affect ROA variation in a given period.

The type of research used is causal-comparative research, as it aims to explain the cause-and-effect relationship between independent and dependent variables. The

data used is secondary data obtained from the financial statements published by BPRs during the period August 2020 to August 2021, as published by the Financial Services Authority (OJK) and the annual reports of each BPR that are sampled. This period was chosen because it represents the financial condition of BPRs during the post-COVID-19 pandemic recovery, where liquidity and profitability have undergone significant changes.

The population in this study includes all BPRs registered with the OJK, while the sample was determined using purposive sampling, which is a sample selection technique based on certain criteria such as the availability of complete monthly financial statements during the research period and not experiencing consecutive operational losses. Based on these criteria, a number of BPRs that are eligible for analysis were obtained.

Data analysis was carried out using the Statistical Package for the Social Sciences (SPSS) to test the hypotheses that had been formulated previously. Before hypothesis testing, a classical assumption test was first carried out which included normality, multicollinearity, heteroscedasticity, and autocorrelation tests to ensure that the regression model used met the appropriate statistical requirements. Once the assumption is met, a simple linear regression analysis is performed with the equation:

$$ROA = \alpha + \beta(LDR) + \varepsilon$$

where ROA is a dependent variable that describes the level of profitability of BPR, LDR is an independent variable that shows the ratio of credit disbursement to third-party funds, α is a constant, β is a regression coefficient that shows the direction

and magnitude of LDR's influence on ROA, and ϵ is an error term that reflects the influence of other variables outside the model.

The statistical tests used include a t-test to determine the partial effect of LDR on ROA, and a determination test (R^2) to see how much of the variation in ROA can be explained by LDR. The decision-making criteria were set based on a significance level of 0.05. If the significance value is less than 0.05, then an alternative hypothesis is accepted, which means that there is a significant influence between LDRs on ROA.

The results of the analysis from SPSS will later be used to prove the truth of Hypothesis 1 (H1) which states that LDR has a positive effect on ROA in BPR, as well as Hypothesis 2 (H2) which states that increasing LDR can increase ROA if accompanied by good risk management and operational efficiency. Thus, this quantitative method provides an empirical basis for assessing the relationship between liquidity and profitability in BPR objectively and measurably.

4. Results

This study aims to analyze the effect of Loan to Deposit Ratio (LDR) on Return on Assets (ROA) at People's Credit Banks (BPR) in Indonesia during the period from August 2020 to August 2021. The test was carried out using a simple linear regression analysis method with the help of the SPSS program. The analysis steps include descriptive statistical tests, classical assumption tests (normality, heteroscedasticity, and autocorrelation), and hypothesis tests through t-tests and F-tests to assess the significance of the influence of LDR on ROA.

Tabel.1 Output SPSS Hasil Uji Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Hours of deviation
LDR	13	74.43	83.20	77.6969	2.92775
LENGTH	13	1.63	1.95	1.8023	.11945
Valid N (listwise)	13				

Table 1 of the results of the descriptive statistical test shows that the minimum LDR value is 74.43%, the maximum is 83.20%, with an average of 77.70% and a standard deviation of 2.93%. This indicates that the average BPR during the study period channeled around 78% of the total third-party funds into the form of credit. According to Inggawati and Lusy (2018), LDRs in the range of 75–85% show fairly efficient intermediation performance without causing excessive liquidity pressure. With a small variation, it can be seen that the level of BPR credit disbursement is relatively stable, which means that the bank's management is able to maintain a balance between the funds disbursed and the available funds.

Meanwhile, the ROA variable shows a minimum value of 1.63%, a maximum of 1.95%, with an average of 1.80% and a standard deviation of 0.12%. The average ROA value of above 1.5% reflects the BPR's fairly good financial condition, in line with the Financial Services Authority (OJK) standards regarding the minimum level of profitability of banks. These results reinforce the findings of Astohar and Sumiyanti (2019), who stated that BPRs have stable profitability during the post-pandemic economic recovery period, despite being faced with fluctuations in credit

demand and increased financing risks. In general, descriptive statistics illustrate that both LDR and BPR ROA in the period August 2020-August 2021 were at a relatively healthy and stable level. This condition indicates that BPR is still able to carry out its intermediation function well, despite the economic slowdown due to the impact of the COVID-19 pandemic.

Table.2 SPSS Output Normality Test Results

One-Sample Kolmogorov-Smirnov Test			
		LDR	LENGTH
N		13	13
Normal Parameters ^{a,b}	Mean	77.6969	1.8023
	Hours of deviation	2.92775	.11945
Most Extreme Differences	Absolute	.166	.253
	Positive	.166	.139
	Negative	-.132	-.253
Test Statistic		.166	.253
Asymp. Sig. (2-tailed)		.200 ^{c,d}	.022c
a. Test distribution is Normal.			
b. Calculated from data.			
c. Lilliefors Significance Correction.			
d. This is a lower bound of the true significance.			

Table 2 shows the results of the normality test using the Kolmogorov–Smirnov method to find out whether the data used in the study were normally distributed. Based on the SPSS output, the number of samples tested was 13 observations for each variable, namely Loan to Deposit Ratio (LDR) and Return on Assets (ROA). The significance value for the LDR variable is 0.200, which is greater than 0.05, so it can be concluded that the LDR data is normally distributed.

Meanwhile, the significance value for the ROA variable is 0.022, which is smaller than 0.05, so the ROA data is not normally distributed. Thus, only the LDR variable meets the assumption of normality, while the ROA shows a slight deviation from the normal distribution.

However, in a simple linear regression analysis, the main normality assumption actually applies to the residual (prediction error), not to the raw data of each variable. Based on the results of the previous scatterplot showing a random and symmetrical residual point distribution around the zero line, it can be concluded that the residual is normally distributed. Therefore, the regression model remains valid and feasible to use for hypothesis testing.

Minor deviations in the ROA data are thought to occur due to the relatively small sample size ($N = 13$) and narrow data range (standard deviation is only 0.12). In the context of financial research, this variation can occur because BPR's profitability during August 2020-August 2021 tends to be stable. Meanwhile, the normal distribution of LDRs shows that BPRs' ability to channel third-party funds into the form of credit is relatively consistent between periods. Overall, the results of the Kolmogorov–Smirnov test reinforce that the simple linear regression model used to test the influence of LDR on ROA in People's Credit Banks meets basic assumptions and can be validly interpreted.

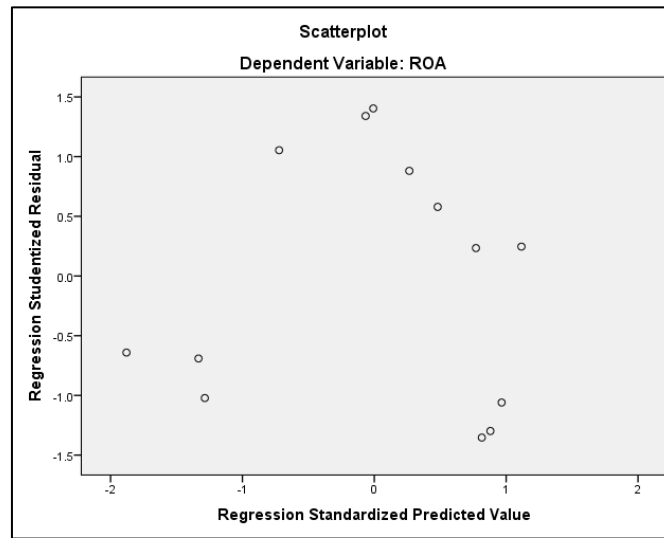


Figure.1 SPSS Output Heteroscedasticity Test Results

Residual scatterplots indicate that the dots are randomly spread above and below the horizontal axis without forming a specific pattern. This shows that heteroscedasticity does not occur, so the regression model is homoscedastic. This condition shows that residual variance is constant at each level of the predictive value, and the regression model does not experience a violation of the residual variance assumption.

Tabel.3 Output SPSS Model Summary

Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Change Statistics					Durbin - Watson
					R Square Change	F Change	df 1	df 2	Sig. F Change	
1										

1	.474 a	.225	.154	.10985	.225	3.191	1	11	.102	.570
a. Predictors: (Constant), LDR										
b. Dependent Variable: ROA										

A Durbin-Watson value (DW) of 0.570 indicates an indication of mild positive autocorrelation between residuals. However, because the sample count is relatively small (N=13) and the model has only one independent variable, this condition is still acceptable. Practically, the fixed model is valid used for hypothesis testing with careful interpretation.

Tabel.4 Output SPSS Coefficients

Coefficients ^a								
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.	Collinearity Statistics	
		B	Std. Error	Beta			Tolerance	VIF
1	(Constant)	3.305	.842		3.925	.002		
	LDR	-.019	.011	-.474	-1.786	.102	1.000	1.000
a. Dependent Variable: ROA								

The regression equations obtained from table 4 (Coefficients) are as follows:

$$ROA = 3.305 - 0.019(LDR)$$

The interpretation of this equation is as follows: Constant ($\alpha = 3.305$) means that if the LDR is considered constant or zero, then the ROA is estimated to be 3.305%. The regression coefficient ($\beta = -0.019$) indicates that any increase in LDR by 1% will decrease the ROA by 0.019 points, assuming the other variables are

constant. A negative sign indicates an inverse proportional relationship between LDR and ROA.

This result indicates that the increase in the proportion of loans to third-party funds has the potential to reduce the profitability of BPRs. These findings are consistent with the research of Budiarto (2021), which found that increasing LDR can reduce BPR performance due to increased risk of bad loans. This condition is also in line with Tampubolon and Prima (2020), who stated that the efficiency of BPR credit distribution does not directly increase profitability due to high operational costs and credit risk costs.

Table 4 of the partial test shows the value of t -calculated = -1.786 with significance (Sig) = 0.102. Since the significance value is greater than 0.05, H_1 is rejected and H_0 is accepted. This means that LDR has no significant effect on ROA at the level of 95%. Thus, although there is a negative tendency between LDR and ROA, the influence is not statistically strong enough. This indicates that the variation in ROA is not solely influenced by liquidity, but also by other factors such as Non-Performing Loans (NPL), Capital Adequacy Ratio (CAR), and operating costs to operating income (BOPO), as stated in Miranda's (2020) research which states that the relationship between LDR and ROA can be moderated by operational efficiency and credit quality.

Tabel.5 Output SPSS ANOVA

ANOVA						
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	.039	1	.039	3.191	.102b

	Residual	.133	11	.012		
	Total	.171	12			
a. Dependent Variable: ROA						
b. Predictors: (Constant), LDR						

From table 5 (ANOVA table), the value of F calculated = 3.191 with the value Sig. = 0.102 (> 0.05). This shows that the regression model as a whole is not significant, so it can be concluded that LDR simultaneously has no effect on ROA. This model is only able to explain a small fraction of the variation in BPR profitability, and the rest is influenced by other factors outside the model.

Table 3 shows a value of $R^2 = 0.225$ which means that 22.5% of the ROA variation can be explained by LDR changes, while the remaining 77.5% is explained by other variables not included in the model. The correlation value $R = 0.474$ indicates that the relationship between LDR and ROA is moderate, although the direction of the relationship is negative. Thus, the influence of LDR on profitability is limited and not dominant.

The results of this study show that empirically the Loan to Deposit Ratio (LDR) does not have a significant influence on the Return on Assets (ROA) in BPR during the period August 2020-August 2021. The direction of the negative relationship between the two indicates that the increase in credit disbursement (high LDR) actually suppresses the bank's profitability level. This is likely due to the increasing cost of credit loss reserves (CKPN) and the risk of non-performing loans in the MSME sector which is the main focus of BPR.

These findings support the research results of Tampubolon and Prima (2020) and Sinaga and Tobing (2020), which show that the effectiveness of BPR financial intermediation has not been optimal due to high operational costs and low net interest margins. However, these results are different from the findings of Hadian and Phety (2021), who found that LDR has a significant positive effect on ROA in general banking. This difference shows that there is a research gap between the characteristics of BPRs and commercial banks, where the business scale, customer profile, and liquidity policies of BPRs are structurally different.

Thus, the results of this study strengthen the view that the relationship between LDR and ROA in BPR is not linear. While increased credit disbursement can increase interest income, high LDRs also increase liquidity risk exposure and bad loans. In the context of post-pandemic economic recovery, these influences have become increasingly complex as BPRs must maintain a balance between credit expansion and the ability to maintain liquidity.

Based on all test results, it can be concluded that the Loan to Deposit Ratio (LDR) does not have a significant effect on the Return on Assets (ROA) at People's Credit Banks during the period of August 2020-August 2021. Although theoretically an increase in LDR can increase interest income, in practice it is not followed by an increase in profitability due to high credit risk and operating expenses. Therefore, BPR management needs to focus on operational efficiency and credit risk management to maintain profitability in the future.

5. Discussion

The results of this study show that the Loan to Deposit Ratio (LDR) variable does not have a significant effect on the Return on Assets (ROA) at People's Credit Banks (BPR) during the period from August 2020 to August 2021. Although the value of the regression coefficient indicates a negative direction, the effect is not statistically strong enough with a significance value of 0.102 (> 0.05). These results illustrate that the increase in credit disbursement has not directly increased the profitability of BPRs. On the contrary, an increase in LDR can actually reduce ROA due to increased liquidity and non-performing credit risks that are not balanced with operational efficiency.

These findings are in line with the research of Tampubolon and Prima (2020), which showed that the efficiency of BPR financial intermediation has not been optimal due to high operational costs and non-performing loan (NPL) ratios. A high LDR does indicate the success of banks in distributing public funds, but on the other hand it increases risks when economic conditions are unstable. This is especially felt during the post-COVID-19 pandemic recovery period, when many BPR customers from the MSME sector have difficulty paying loan obligations.

This research also supports the results of Winarso and Gunanta (2020) who found that increasing LDR can suppress the profitability of BPRs due to increased credit risk that is not balanced with the growth of interest income. In the context of BPR, these risks are more sensitive than commercial banks because BPR's loan portfolio is concentrated in micro customers with low financial resilience. As a result,

a high LDR doesn't necessarily mean efficient, but it can be a sign of liquidity pressures that have the potential to lower profits.

On the contrary, the results of this study are not in line with the findings of Hadian and Phety (2021), who stated that LDR has a positive effect on ROA in commercial banks in Indonesia. This difference in results reflects structural differences between BPRs and commercial banks, both in terms of capital, funding sources, and risk profiles. Commercial banks have a wider diversification of their portfolios and greater access to liquidity, so an increase in LDR can increase profits without incurring significant liquidity risks. On the other hand, BPRs face limited funds and a narrower financing structure.

Another finding that supports this study comes from Miranda (2020), who states that LDR can have a positive effect on ROA only if it is accompanied by good risk management and operational efficiency. In the case of BPRs, operational efficiency is often a major obstacle due to the limited scale of the business and the high cost structure. Therefore, increasing LDR without increasing efficiency can actually worsen profitability performance. In addition to internal factors, macroeconomic conditions during the study period also influenced these results. According to Astohar and Sumiyanti (2019), economic fluctuations and restrictions on post-pandemic activities have led to a decrease in credit demand and an increase in the risk of bad loans in the MSME sector. This makes BPRs have to be more careful in distributing credit, so that the relationship between LDR and ROA becomes statistically insignificant.

Conceptually, these results reinforce the theory that a bank's profitability is determined not only by the level of credit disbursement, but also by the effectiveness of risk management and operational cost efficiency. An increase in LDR can indeed drive profits, but only if it is followed by good credit risk and liquidity controls. Thus, the results of this study provide important implications for BPR management to not only focus on improving LDR ratios, but also pay attention to credit quality and efficiency in operations. The results of this study show that the influence of LDR on ROA in BPR is weak and insignificant, and is influenced by various external and internal factors. This condition confirms the need for a more conservative liquidity management strategy for BPRs to maintain profitability without sacrificing financial stability in the future.

6. Conclusion

Based on the results of the analysis and discussion that has been carried out, it can be concluded that the Loan to Deposit Ratio (LDR) does not have a significant effect on the Return on Assets (ROA) at People's Credit Banks (BPR) during the period from August 2020 to August 2021. Although theoretically an increase in LDR can magnify potential interest income, empirical results show that an increase in LDR tends to decrease profitability, although the effect is not statistically significant. This indicates that the efficiency of credit distribution at BPRs has not been fully able to increase profits because it is still influenced by other factors such as operational costs, credit risk, and asset quality.

In addition, the results showed that the variation in ROA in BPR was only able to be explained in part by changes in LDR, while most of it was influenced by other variables outside the model. Thus, BPR management needs to pay attention to the balance between credit distribution and liquidity management to maintain profitability stability. This research also emphasizes the importance of risk management and operational efficiency in strengthening the financial performance of BPRs. Overall, the results of this study provide an understanding that the increase in LDR is not always directly proportional to the increase in ROA, so liquidity and credit risk management strategies are key factors in maintaining BPR's financial performance in a sustainable manner.

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