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The Effect of CAR, LDR and ROA on NPL in Banking Companies Listed on the Indonesia Stock Exchange

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Abstract. This study aims to examine the effect of Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), and Return On Asset (ROA) on Non-Performing Loans (NPL) in banking companies listed on the Indonesia Stock Exchange in 2021-2023. The data used in the study was obtained from the Financial Statements published by the Indonesia Stock Exchange. The data analysis technique used is Multiple Liniear Regression Analysis with the help of SPSS V26 of 2024. With a population of 48 which were subsequently eliminated according to the criteria until there were 34 samples left with the following analysis results: Capital Adequacy Ratio (X1) had a significant effect on Non-Performing Loans with a significance of 0.000 < 0.05; Return On Asset had an effect on Non-Performing Loans with a significance of 0.035 < 0.05; Loan to Deposit Ratio had no significant effect on Non-Performing Loans with a significance of 0.058 > 0.05.

Keywords : Capital Adequacy Ratio (CAR); Loan to Deposit Ratio (LDR); Return On Asset (ROA); Non Performing Loan (NPL)

INTRODUCTION

A bank is a financial institution that plays an important role in the economy by carrying out the main activity in the form of collecting funds from the public through various types of deposits, such as savings, deposits, and current accounts. The collected funds are then managed and distributed back to the community in the form of loans or credits for various purposes, including consumption, investment, and business financing.

The banking sector plays a vital role in supporting the progress of the national economic system and financing function by becoming a financial intermediary. Banks also carry out functions as implementers of government policies, so the health of banks needs to be considered. Along with the development of society and economic activities, the role of banking continues to be improved, especially through product innovations such as deposits in the form of savings, current accounts, deposits or credit services. According to Ali in Abyanta et al. (2019), a bank that provides credit will contain risks, namely in the form of unsmooth credit payments or what is commonly called credit risk. Credit risks such as bad loans or often referred to as Non-Performing Loans (NPL) or non-performing financing. Non-Performing Loans (NPLs) are an indication of a problem in the bank which if not immediately solved will have a bad impact on the bank.

To reduce credit risks arising from credit problems, the bank will allocate a number of funds aimed at developing the business and covering losses that may arise due to the bank's operational activities. This fund is known as the Capital Adequacy Ratio (CAR), which is a Capital Adequacy Ratio. CAR serves as a financial buffer that helps banks maintain their financial stability and health, especially in the face of potential losses that are likely to occur in the future. According to (Irwan, 2020), the Capital Adequacy Ratio (CAR) is a capital ratio

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that shows the bank's ability to provide funds used for business development purposes and accommodate the possible risk of losses resulting from bank operations.

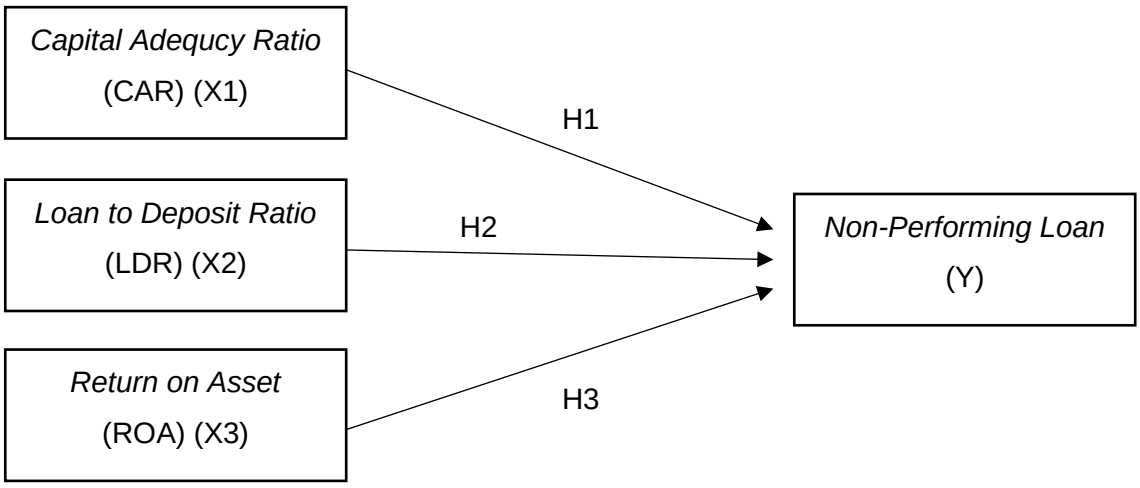
One of the largest sources of funding in banking is external funds, namely funds that come from third parties such as customers or investors. Banks manage these funds by placing funds in various instruments that can bring profits, such as distributing credit to customers. With the increase in third-party funds, banks have greater ability to increase credit distribution to customers and can encourage the rate of national economic growth. The larger the amount of credit disbursed, the greater the risk that must be borne by the bank. Loan to Deposit Ratio is a ratio that shows the comparison between credit disbursed by banks and funds obtained from third parties. A high LDR indicates banks allocate most of the funds raised to credit, which also means higher credit risk. On the other hand, a low LDR indicates that banks are more cautious in distributing credit so that credit risk is lower.

According to (Marsono & Edy, 2021), in measuring the level of efficiency of asset management in banks, Return On Asset (ROA) is needed, which is to measure how much the bank is able to obtain profits (profits) by using a comparison between net profit and total bank assets. The higher the Return on Asset (ROA), the greater the profit obtained by the bank, reflecting the efficiency in utilizing its assets to generate profits. ROA is also an indicator of the bank's financial health, as the bank demonstrates a good ability to manage risk and invest to achieve profitability.

Based on the background of the problems that have been described, further research was carried out on these problems with the title **"The Effect of Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), and Return On Asset (ROA) on Non-Performing Loans of Banking Companies Listed on The Indonesia Stock Exchange (IDX)"**

The frame of mind is a conceptual model of how theories between relationships and various factors have been identified as important issues. These factors are Capital Adequacy Ratio (CAR) (X1), Loan to Deposit Ratio (LDR) (X2), and Return on Asset (ROA) (X3) which are considered to affect NPL (Y).

Figure 1 Theoretical Framework



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METHOD

This study uses a quantitative descriptive method. The data used in the study was obtained from the Financial Statements published by the Indonesia Stock Exchange. The population in this study is 49 companies that are banking companies listed on the Indonesia Stock Exchange. Using the Documentation data collection method with the variables Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Return On Asset (ROA), and Non Performing Loan (NPL) levels with the determination of the sample used is the Purposive Sampling technique so that 34 companies are produced according to the criteria. Primary data taken from the Indonesia Stock Exchange website was processed using the multiple linear analysis method using SPSS version 26 in 2024.

RESULTS AND DISCUSSION

Descriptive statistics are statistics that are used to analyze data by describing or describing data that has been collected without intending to make generalized conclusions or generalizations (Sugiyono, 2019).

Table 1
Descriptive Statistics

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
CAR	102	,11	2,84	,4357	,43484
LDR	102	,12	9,32	1,1484	1,32606
ROA	102	,00	,27	,0691	,03646
NPL	102	,00	7,99	2,4647	1,32129
Valid N (listwise)	102				

Based on the descriptive table above, it can be explained as follows:

a. The display of the spss output table above on the CAR variable shows that the number of samples (N) is 102, the minimum value is 0.11, the maximum value is 2.84, the average value is 0.4357 with a standard deviation value of 0.43484.
b. The display of the spss output table above on the LDR variable shows that the number of samples (N) is 102, the minimum value is 0.12, the maximum value is 9.32, the average value is 1.1484, with a standard deviation value of 1.32606.
c. The display of the spss output table above on the ROA variable shows that the number of samples (N) is 102, the minimum value is 0.00, the maximum value is 0.27, the average value is 0.691 with a standard deviation value of 0.3646.
d. The display of the spss output table above on the NPL variable shows that the number of samples (N) is 102, the minimum value is 0.00, the maximum value is 7.99, the average value is 2.4647 with a standard deviation value of 1.32129.

The normality test serves to predict whether the value of the dependent variable (Y) is normally distributed to the independent variable (X) or not. This test tool is used to determine whether in a regression model the residual value of the regression has a normal distribution (Santoso, 2018).

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Table 2
Normality Test Results

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		102
Normal Parameters[a,b]	Mean	,0000000
	Std. Deviation	1,29484764
Most Extreme Differences	Absolute	,057
	Positive	,057
	Negative	-,036
Test Statistic		,057
Asymp. Sig. (2-tailed)		,200c,d
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		
d. This is a lower bound of the true significance.		

Based on the SPSS output in table 4.2 states that Asymp. Sig. (2-tailed) of 0.200 so that it can meet the requirements of the normality test with a sig value of > 0.05 or 0.200 > 0.05. Thus, it can be concluded that the data is normally distributed and the test can be continued in the regression analysis.

The autocorrelation test is an assumption test that is commonly used to detect the presence or absence of autocorrelation. This autocorrelation test was carried out using the Durbin Watson Test method.

With the following testing criteria (Santoso, 2018):

1. Autocorrelation occurs when the value of d < dL or d > 4 – dL
2. There is no autocorrelation if the value of dU < d < 4 – dU

There is no conclusion if the value of dL < d < dU or 4 – dU < d < 4 – dL

Table 3
Autocorrelation Test Results

Model Summary[b]					
Type	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,474a	,225	,193	1,18975	1,864
a. Predictors: (Constant), LDR, CAR, ROA					
b. Dependent Variable: NPL					

Autocorrelation test, Durbin Watson's value was 1.864 by comparing Durbin Watson's value. Therefore, it can be seen that dU < dW < 4-dU or 1.7383 < 1.864 < 2.2617, then it can be concluded that there is no positive or negative autocorrelation.

The regression model to be used to predict must not correlate strongly and significantly between independent variables. According to Santoso (2018), this test was carried out to measure the magnitude of correlation between independent variables. If two independent variables are proven to correlate strongly, there are symptoms of multicollinearity in both variables.

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Table 4
Multicollinearity Test Results

Coefficientsa			
Type		Collinearity Statistics	
		Tolerance	VIF
1	CAR	,991	1,009
	LDR	,714	1,401
	ROA	,714	1,401
a. Dependent Variable: NPL			

a. The Tolerance value for the Capital Adequancy Ratio is 0.991 >0.10 and the VIF value is 1.009<10.000, the CAR variable is declared free of multicollinearity
b. The tolerance value for the Loan to Deposit Ratio is 0.714>0.10 and the VIF value is 1.401 < 10.000, the LDR variable is declared free from multicollinearity.
c. The tolerance value for Return on Assets is 0.714>0.10 and the VIF value is 1.401 < 10,000, then the ROA variable is declared free from multicollinearity.

Based on the description above, it can be concluded that in this study there are no symptoms of multicollinearity between independent variables.

According to (Ghozali, 2018), the heteroscedasticity test is a regression model that aims to test whether there are residual variants that are not the same from one observation to another. If the residual variant from one observation to another remains the same, it is called homoscedasticity, and if it is different, it is called heteroscedasticity.

Table 5
Heterokedasticity Test Results

Coefficientsa						
Type		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	1,315	,186		7,057	,000
	CAR	-,013	,185	-,007	-,071	,944
	LDR	-,078	,071	-,128	-1,098	,275
	ROA	-3,167	2,599	-,142	-1,218	,226
a. Dependent Variable: NPL						

Based on the results of the above study, the significance value of each variable X_1, X2, X3 > 0.05, it can be concluded that there is no heteroscedasticity problem. So that from the three classical assumption tests, it is certain that they are qualified to proceed to multiple linear regression analysis.

According to Sugiyono (2018) stated that multiple regression analysis is used to determine the state (fluctuation) of dependent variables, if two or more independent variables as predictor variables are manipulated or their values fluctuate.

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Table 6
Multiple Linear Regression Analysis Test Results

Coefficientsa						
Type		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,556	,125		20,472	,000
	CAR	-,559	,124	-,410	-4,514	,000
	LDR	-,092	,048	-,205	-1,917	,058
	ROA	3,726	1,741	,229	2,140	,035
a. Dependent Variable: NPL						

In the table "Coefficients" above, it can be explained about the double regression equation in this study. The regression equation formula in this study is as follows:

$$Y = \alpha + \beta 1x1 + \beta 2x2 + \beta 3x3 + \varepsilon$$

$$Y = 2{,}556 - 0.559\ x1 - 0.092\ x2 + 3{,}726\ x3$$

From the regression equation above, the conclusions that can be explained are as follows:

a. The constant value (α) of 2.556 indicates the point at which the regression line intersects the Y axis when all X variables are zero. If the variable Y is NPL, the positive constant indicates that there are fixed costs to be borne even if CAR, LDR, and ROA are zero.
b. The value of the regression coefficient of the CAR variable (X1) is - 0.559 with a negative sign stating that if the CAR level increases by one unit assuming that the other independent variables are constant, then the NPL will decrease by 0.559.
c. The value of the regression coefficient of the LDR variable (X2) is -0.092 with a negative sign stating that if the LDR rate increases by one unit assuming that the other independent variables are constant, then the NPL will decrease by 0.092.
d. The value of the regression coefficient of the ROA variable (X3) of 3.726 with a positive sign states that if the ROA rate increases by one unit assuming that other free variables are constant, then NPL will increase by 3.726

According to Ghozali (2015), the goodness of fit test (model feasibility test) was carried out to measure the accuracy of the regression function of the sample in statistically estimating the actual value. This statistical test F is used to show whether all dependent variables included in the model have a joint or simultaneous influence on the dependent variables.

Table 7
Test Result F

ANOVAa						
Type		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	6,988	3	2,329	8,019	,000B
	Residual	28,466	98	,290		
	Total	35,454	101			
a. Dependent Variable: NPL						
b. Predictors: (Constant), ROA, CAR, LDR						

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Based on the SPSS "Anova" output table above, it is known that the Significance (Sig) value is 0.000 < 0.05, so it can be concluded that the model is feasible.

According to Sugiyono (2018), the purpose of the t-test is to see how far the influence of one independent variable individually in explaining the variation of the dependent variable. This test is the basis for making decisions to accept or reject the hypothesis in the study with consideration of the constant significance of each independent variable.

Table 8
Test Results t

Coefficients[a]						
Type		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	2,556	,125		20,472	,000
	CAR	-,559	,124	-,410	-4,514	,000
	LDR	-,092	,048	-,205	-1,917	,058
	ROA	3,726	1,741	,229	2,140	,035
a. Dependent Variable: NPL						

Based on the table above, the influence of each free variable on the bound variable is as follows:

1. CAR (X1) test against NPL (Y)
   The first hypothesis in this study is that CAR (X1) has a significant effect on NPL(Y). Based on the SPSS output table "Coefficients" above, it is known that the Significance (Sig) value of the CAR variable is 0.000. Since the value of Sig. 0.000 < probability of 0.05, it can be concluded that Ho is rejected and H1 is accepted. This means that there is a significant influence between CAR (X1) and NPL (Y).
2. LDR (X2) test against NPL (Y)
   The second hypothesis in this study is that LDR (X2) has a significant effect on NPL (Y). Based on the SPSS output table "Coefficients" above, it is known that the Significance (Sig) value of the LDR variable is 0.058. Since the value of Sig. 0.058 > probability of 0.05, it can be concluded that H2 is rejected and Ho is accepted. This means that there is no significant influence between LDR (X2) and NPL (Y).
3. ROA (X3) test against NPL (Y)
   The third hypothesis in this study is that ROA (X3) has a significant effect on NPL (Y). Based on the SPSS output table "Coefficients" above, it is known that the Significance (Sig) value of the ROA variable is 0.035 Because the Sig. value is 0.035 < probability of 0.05, it can be concluded that H3 is accepted and Ho is rejected. This means that there is a significant influence between ROA (X3) and NPL (Y).

According to Ghazali (2011), the determination coefficient (R^2) aims to measure how far the model is able to apply dependent variable variations.

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Table 9
Determination Coefficient Test Results

Model Summary[b]					
Type	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	,594a	,352	,325	,488	1,864
a. Predictors: (Constant), LDR, CAR, ROA					
b. Dependent Variable: NPL					

Based on the SPSS output table "Model Summary" above, it is known that the value of the determination coefficient / R Square is 0.352 or equal to 35.2%. This figure means that the variables CAR (X1), LDR (X2), and ROA (X3) have a significant effect on the NPL (Y) variable by 35.2%. While the rest (100% - 35.2% = 64.80%) is influenced by other variables outside this regression equation or variables that are not studied.

CONCLUSIONS AND SUGGESTIONS

a. Conclusion

The results of this study reveal that the Capital Adequacy Ratio (CAR) significantly influences Non-Performing Loans (NPL), indicating that a bank's capital strength impacts its loan quality. In contrast, the Loan-to-Deposit Ratio (LDR) does not have a significant effect on NPL, suggesting that the proportion of loans to deposits is not a critical factor in determining loan performance. Additionally, the Return on Assets (ROA) shows a significant impact on NPL, highlighting that a bank's profitability plays a vital role in managing loan defaults.

b. Suggestion

Based on the results of the research and the conclusion above, the suggestions that can be submitted by the researcher are as follows. For prospective investors, it is recommended to carefully evaluate a bank's Capital Adequacy Ratio (CAR), as higher CARs are associated with lower Non-Performing Loan (NPL) risks, making such banks safer investment options. Additionally, investors should analyze the bank's Return on Assets (ROA), as a strong ROA reflects operational efficiency and indicates potential future profit growth. For banks, strengthening CARs should be a priority to maintain stability and minimize NPL risks, achievable through capital enhancement or improved asset management. While the Loan-to-Deposit Ratio (LDR) does not significantly impact NPLs, banks should still evaluate their loan and deposit management strategies, ensuring a primary focus on maintaining high-quality loans. Furthermore, effective risk management practices are essential, with particular attention to monitoring economic conditions and debtor performance to mitigate factors that could influence NPLs.

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