Vol. 8, No. 3, 2022, pp. 710-718 DOI: https://doi.org/10.29210/020221514



Contents lists available at **Journal IICET**

IPPI (Jurnal Penelitian Pendidikan Indonesia)

ISSN: 2502-8103 (Print)ISSN: 2477-8524(Electronic)

Journal homepage: https://jurnal.iicet.org/index.php/jppi



The effect of capital adequacy ratio and loan to deposit ratio on return on asset with non-performing loan as moderating variable in banking companies listed in BEI

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Article Info

Article history:

Received Feb 09th, 2022 Revised Jun 14th, 2022 Accepted Sep 10th, 2022

Keyword:

Capital adequacy, Loan to deposit ratio, Financial, Credit risk

ABSTRACT

This study aims to know the impact of capital adequacy and loan to deposit ratio on financial performance with credit risk as a moderating variable in the banking companies listed on the Indonesia Stock Exchange period of 2015 to 2019. We have 43 banking companies in population, and we take 23 companies as our samples. The data analysis model is an interaction method, usually referred to as Moderated Regression Analysis (MRA). The results show that capital adequacy has an impact on financial performance in banking companies listed on the Indonesia Stock Exchange from 2015 to 2019. The loan to deposit ratio does not effect financial performance. The existence of credit risk, as the moderating variable, will strengthen the relationship between capital adequacy and financial performance and the relationship between the loan to deposit ratio and financial performance. Also, the existence of credit risk as the moderating variable will strengthen capital adequacy and loan to deposit ratio on financial performance.



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Introduction

Currently, the banking industry is facing very tight competition, so all banks are trying to improve their financial performance. Bank's financial performance can usually be measured by profit, known as Return on Assets. Bank management must maintain the level of Return on Assets. The banking company uses Return on Assets to analyze the company's financial performance in asset management. The bank's performance depends on the source of funding for money distributed to customers or the public. One source of funding that has a significant impact on the economy is the banking sector. Banks are trust institutions that act as intermediariesthat support the smooth running of the payment system and are equally important as institutions that act as a means of implementing monetary policy. The collection of bank funds can be used as the main source of funding apart from the owner's capital in order to carry out operational activities. Adequate capital adequacy as a reflection to protect the bank from unexpected losses, support future growth, and increase public confidence in the state of the bank.

In this study, the capital adequacy ratio is expressed in the Capital Adequacy Ratio (CAR). Banks must be able to meet the capital adequacy requirements to protect the value of risks that may occur in carrying out

business activities. If the bank already has sufficient capital, then the bank has sufficient financial resources to guard against potential losses. If the capital adequacy can be met, it will be able to increase the bank's ability to increase profits. When the economy is in crisis, the demand for credit increases, and slowly Non-Performing Loans (NPLs) also decline. This is also supported by credit risk, especially the risk from banks which shows the ability of bank management to manage non-performing loans provided by banks so that the higher the NPL ratio, the worse the credit quality of a bank because it causes the number of non-performing loans to get bigger. Of course, this problem will also effect the level of bank performance, where when the number of bad loans is greater, the effectiveness of the bank's performance will decrease. (Lestari, 2019).

The main activity of the Bank is to generate profits, and the bank also requires sufficient capital to carry out business activities. To continue to have sufficient capital to meet healthy CAR standards, banks must be able to obtain a return on assets (ROA) which will increase the bank's capital. If the bank already has sufficient capital, then the bank has sufficient financial resources to guard against potential losses. If the capital adequacy has been met, it will be able to increase the bank's ability to improve banking financial performance. The results of Lestari's research (2019) stated that banks that have sufficient capital certainly show good banking financial performance. This is also supported if the CAR is greater, then bank's will get profit.

Bank Indonesia stipulates that every bank must have an NPL value below 5 percent which reflects the maximum value of non-performing loans from all loans extended to the public by the bank. The research replication of Purba and Damayanthi (2018) states that the higher the bank's NPL level, the lower the company's profitability. The cost of overcoming a high NPL value will cause the loss of opportunities to obtain company profits from lending, which will adversely effect bank profitability.

Banking in obtaining interest income is inseparable from the problem of credit risk or known as bad credit which is an obstacle to increasing company profits. The smaller the NPL, the smaller the credit risk borne by the bank so that the bank's value is good, then Bank Indonesia sets the criteria for a net NPL ratio of below 5%. Credit risk arises because of the customer's inability to repay the loan. The higher the NPL, the smaller the ROA caused by non-performing interest income.

The results of research from Inayah (2019) stated that the GCG variable had a negative and significant effect on the Financial Performance of Islamic Banks (ROA); CAR has a negative and significant effect on the Financial Performance of Islamic Banks (ROA); TPF has a negative and insignificant effect on the Financial Performance of Islamic Banks (ROA); Financing Volume is not able to moderate the effect of the GCG variable on ROA; Financing Volume is able to moderate the effect of the CAR variable on ROA; Financing Volume can moderate the effect of the TPF variable on ROA.

Research conducted by Moorcy (2020) using the multiple linear analysis methods to conclude the financing to deposit ratio, operating costs per operating income, non-performing loan, and capital adequacy ratio simultaneously have a positive and significant effect and there is a very strong relationship to Return On Assets at PT. Mandiri Syariah Bank; Financing to Deposit Ratio partially positive and significant effect on Return On Assets at PT. Mandiri Syariah Bank; Operational Costs per Operating Income partially have a negative and significant effect as well as dominant on Return On Assets at PT. Mandiri Syariah Bank; Non-Performing Loan partially has a negative and insignificant effect on Return On Assets at PT. Mandiri Syariah Bank; and Capital Adequacy Ratio partially positive and insignificant effect on Return On Assets at PT. Mandiri Syariah Bank.

Method

The author employs a causal associative research method with a quantitative approach in this study. The term "causal associative research" refers to research determining the causal relationship between the independent variable (the one that affects) and the dependent variable (the variable that is affected) (Fitrianingsih et al., 2020). From this explanation, it can be said that the causal associative method with a quantitative approach is a method that aims to find out and describe the relationship between one variable and another causal variable by collecting data, processing, analyzing, and also interpreting data in statistical hypothesis testing. The author uses this method because this research is intended to analyze the causal relationship clearly how the influence of the variables Capital Adequacy Ratio (CAR), Loan to Debt Ratio (LDR), and Non-Performing Loan (NPL) on Return on Assets (ROA). The study was conducted in banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019. According to Arifin (2017:10), "Purposive sampling, sampling is based on certain considerations from the researcher so that the sample is only representative for the population being studied."

Table 1. Research Sample

Criteria	Sample
Banking Companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019.	43
Banking companies that do not publish financial statements for the period of 2015 to 2019.	(12)
Banking Companies that do not have a positive net profit in a row for the period of 2015 to 2019.	(8)
Total samples studied from the period of 2015 to 2019.	23
Total samples 23 x 5 years	115

The number of research observations is 115.

Data Analysis Techniques

The data analysis model used in this study is an interaction method which is often called Moderated Regression Analysis (MRA). The interaction test was carried out by multiplying the hypothesized variable as the moderating variable with the independent variable. If the multiplied variable between the independent variable and the hypothesized variable as a significant moderating variable, it can be concluded that the variable hypothesized as a moderating variable actually moderates the relationship between the independent variable and the dependent variable.

Types and Sources of Data

According to Sujarweni (2019: 73-74), "Secondary data is data obtained from records, books, magazines in the form of financial reports for company publications, government reports, articles, books as theories, magazines and so on."The type of data used in this study is secondary data. The secondary data obtained by the researcher is the financial statements of banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019.

Research Variables and Operational Definitions

This study uses variables consisting of the dependent variable (dependent variable), independent variable (independent variable), and moderating variable. The dependent variable used in this study is return on assets (Y); independent variable is capital adequacy ratio (X_1) , loan to deposit ratio (X_2) ; while the moderating variable is non-performing loan (Z).

Results and Discussion

Descriptive statistics

Descriptive statistics in this study are intended to provide an overview of the data that has been processed including frequency, mean, and standard deviation.

Table 2. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
CAR	115	10.52	38.60	20.7812	4.76075
LDR	115	50.43	167.23	88.4351	14.01402
ROA	115	.11	3.97	1.8287	.97593
NPL	115	.00	7.66	1.7340	1.17783
Valid N (listwise)	115				

Based on Table 2, it shows that the variables CAR, LDR, NPL, and ROA each have a total sample of 115; has a minimum value of 10.52, 50.43, 0.00, and 0; maximum values of 38.60, 167.23.7.66, and 3.97; the average value is 20.7812, 88.4351, 1.7340, and 1.8287; and standard deviation values of 4.76075, 14.01402, 1.17783, and 0.97593.

Normality Test

The data distribution test aims to test the research data whether in the statistical model, the dependent variable and the independent variable are normally distributed or not. To determine the distribution of data in a study, one of the tools used is the Kolmogorov Smirnov test. This study uses a normality test using a non-parametric statistical test Kolmogorov Smirnov Test to guide decision making data that is close to or in accordance with the normal distribution with the following conditions: 1) If the significant value is > 0.05 then the distribution is normal; 2) If the significant value < 0.05 then the distribution is not normal.

Table 3. One-Sample Kolmogorov-Smirnov Test Sebelum Transformasi

One-Sample Kolmogorov-Smirnov Test		
		Unstandardized Residual
N		115
Normal Parameters ^{a,b}	Mean	.0000000
	Std. Deviation	.99954743
Most Extreme Differences	Absolute	.081
	Positive	.081
	Negative	042
Test Statistic	-	.081
Asymp. Sig. (2-tailed)		.041 ^c
a. Test distribution is Normal.		
b. Calculated from data.		
c. Lilliefors Significance Correction.		

From table 3, the normality test using the Kolmogorov-Smirnov statistic above, it can be seen that the variables of Capital Adequacy (X_1) , Loan to Deposit Ratio (X_2) and financial performance (Y) have met the normal distribution requirements because the sig value is 0.041 < 0.05 so that the data is normal.

Multicollinearity Test

Multicollinearity test is used to test the correlation between independent and dependent variables by looking at the regression model. To detect the presence or absence of multicollinearity in the regression model, it can be seen from the tolerance value and variance inflation factor. If the VIF value is 10 and the tolerance value is 0.10, the regression model does not have multicollinearity.

Table 4. Multicollinearity Test Results

Model		Collinearity Statistic	S	
		Tolerance	VIF	
1	(Constant)			
	CAR	.999	1.001	
	LDR	.999	1.001	

Based on Table 4 showing the value of tolerance variable Capital Adequacy (X_1) , Loan to Deposit Ratio (X_2) greater than 0.999 than 0.10 can be concluded that there is no multicollinearity. The VIF value obtained for the Variable Capital Adequacy (X_1) , Loan to Deposit Ratio (X_2) of 1,001 is below 10. So it can be concluded that there is no multicollinearity between independent variables in the regression model.

Autocorrelation Test

Autocorrelation test is used to test whether in a linear regression model there is a correlation between the confounding error in period t and the confounding error in period t-1 (previous period).

The decision-making requirement for the autocorrelation test is that if there is no autocorrelation, the significant value is greater than 0.05 and vice versa.

Table 5. Autokorelasi-Run Test

Runs Test		
	Unstandardized Residual	
Test Value ^a	09167	
Cases < Test Value	57	
Cases >= Test Value	58	
Total Cases	115	
Number of Runs	67	
Z	1.593	
Asymp. Sig. (2-tailed)	.111	
a. Median		

Autocorrelation-run test shows sig. 0.1 above 0.05 means that there is no autocorrelation.

Heteroskedasticity Test

A good regression model is Homoscedasticity or Heteroscedasticity does not occur. In this study, researchers will use the Glejser test. The requirement for making the decision of the Glejser test is that if the significant value is greater than 0.05 then there will be no heteroscedasticity, and vice versa.

Table 6. Glejser Test Results

	Coefficients ^a									
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.				
		В	Std. Error	Beta						
1	(Constant)	.761	.369		2.064	.041				
	CAR	.017	.010	.160	1.728	.087				
	LDR	005	.003	137	-1.482	.141				
a. Depe	ndent Variable	: Abs_ut								

Table 6 shows the significant value of variables Capital Adequacy (X_1) , Loan to Deposit Ratio (X_2) is above 0.05 inferred there is no heteroskedasticity.

Multiple Linear Regression Analysis

The purpose of using multiple linear regression equations is to estimate or estimate the variation in the value of a dependent variable caused by variations in the value of an independent variable.

Table 7. Multiple Linear Regression Analysis Results

			Coefficient	ts ^a		
Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		В	Std. Error	Beta		
1	(Constant)	493	.631		781	.436
	CAR	.101	.017	.495	6.022	.000
	LDR	.002	.006	.035	.422	.674
a. Depe	ndent Variable	: ROA				

Based on table 7 obtained the following regression formula: ROA = -0.493 + 0.101 CAR + 0.002 LDR + e From the regression equation above it can be concluded that: 1) In the equation of multiple linear regression above is known the value of constant (a) of -0.493 means that if the variable Capital Adequacy (X_1), Loan to Deposit Ratio (X_2) or equal to 0, then financial performance of -0.493 units; 2) The magnitude of the coefficient b1 is 0.101 which means it shows the direction of the positive relationship between capital adequacy and financial performance. Positive signs indicate the effect of Capital Adequacy on financial performance, namely the Capital Adequacy variable rises by one unit, then financial performance will rise by 0.101 assuming the loan to deposit ratio variable is constant;3) The magnitude of the coefficient b2 is 0.002 which means it shows the direction of the positive relationship between loan to deposit ratio and financial performance. Positive signs indicate the effect of Loan to Deposit Ratio on financial performance, namely the Loan to Deposit Ratio variable rose by one unit, then financial performance will rise by 0.002.

Coefficient of Determination(R2)

The coefficient of determination test is used to measure how much the influence of the independent variable can explain the dependent variable. The greater value on the coefficient of determination, the better the ability of the variance and the independent variable to explain the dependent variable.

Table 8. Coefficient of Determination

Model Summary										
Model	R	R Square	Adjusted R Square	Std.	Error	of	the			
		-		Estimate						
1	.495ª	.245	.231	.8556	5					
a. Predicto	ors: (Constant),	LDR, CAR								

Based on Table 8, it is obtained that the adjusted R Square (R₂) coefficient of determination is 0.231 or equal to 23.1% influenced by the independent variable on the dependent variable. While the remaining 76.9% is

influenced by other variables not examined, such as Company Size, BOPO, Third Party Funds, and the level of lending.

Simultaneous Hypothesis Testing (Statistical Test F)

The F test is used to test whether the independent variables jointly effect the dependent variable. Based on the results of data processing with the SPSS program, the results of the F test are obtained as follows:

Table 9. Statistical Test Results F

			ANOVA ^a			
Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	26.578	2	13.289	18.151	.000 ^b
	Residual	82.000	112	.732		
	Tota1	108.578	114			

a. Dependent Variable: ROA

b. Predictors: (Constant), LDR, CAR

Table 9 shows the results of F_{count} of 18,151 with a significant value of 0.000 while F_{table} (115-3=112) is equal to 3.08, so the conclusion is $F_{count} > F_{table}$ which is 18,151 > 3.08 so that the decision is H_0 is rejected and H_a is accepted, meaning the variable of CAR and Loan to deposit ratio effect the financial performance of banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019.

Partial Hypothesis Testing (Statistical Test t)

The t-test is used to test whether the independent variables individually effect the dependent variable. Based on the results of data processing with the SPSS program, the results of the t-test are as follows: 1) Table 7 shows that the capital adequacy variable has a t_{count} of 6.022 with a significant value of 0.000 <0.05, while the value of t_{table} (115-2=113) is 1.981 so the conclusion is t_{count} > t_{table} ie 6.022>1.981 then the decision is H_0 is rejected and H_a is accepted, meaning that the capital adequacy variable effects the financial performance of banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019; 2) The Loan to deposit ratio variable has a t_{count} value of 0.422 with a significant value of 0.674> 0.05, while the t_{table} is equal to 1.981, the conclusion is t_{count} < t_{table} which is 0.422 <1.981 so that the decision is H_0 is accepted and H_a is rejected, meaning that the Loan to deposit ratio variable has no effect on the financial performance of banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019.

Moderated Regression Analysis Test

According to Ghozali (2018:221) moderating variables are independent variables that will strengthen or weaken the relationship between other independent variables on the dependent variable. Moderated Regression Analysis (MRA) test aims to determine whether the moderating variable strengthens or weakens the relationship between the independent variable and the dependent variable. The equation model used for this MRA test is:

 $Y = a + b_1X_1 + b_2X_2 + b_3X_1*Z + b_4X_2*Z + e$

Table 10. Moderation Regression Equation

		Coefficients ^a			
	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	В	Std. Error	Beta		
Constant)	.641	1.039		.617	.539
AR	.073	.030	.354	2.442	.016
DR	.000	.009	005	037	.970
AR.NPL	010	.022	287	478	.633
DR.NPL	006	.004	669	-1.599	.113
AR.LDR.NPL	.000	.000	.802	1.071	.286
	AR DR AR.NPL DR.NPL	B Constant) .641 AR .073 DR .000 AR.NPL010 DR.NPL006	Unstandardized Coefficients B Std. Error Constant) .641 1.039 AR .073 .030 DR .000 .009 AR.NPL 010 .022 DR.NPL 006 .004	Unstandardized Coefficients Standardized Coefficients B Std. Error Beta Constant) .641 1.039 AR .073 .030 .354 DR .000 .009 005 AR.NPL 010 .022 287 DR.NPL 006 .004 669	Unstandardized Coefficients Standardized Coefficients t B Std. Error Beta Constant) .641 1.039 .617 AR .073 .030 .354 2.442 DR .000 .009 005 037 AR.NPL 010 .022 287 478 DR.NPL 006 .004 669 -1.599

a. Dependent Variable: ROA

ROA = 0,641 + 0,073 CAR + 0,000 LDR - 0,010 CAR.NPL - 0,006 LDR.NPL + 0,000 CAR.LDR.NPL

Moderation Testing with the MRA (Moderated Regression Analysis) Method with three hypotheses, namely: According to Ghozali (2018:222) the type of moderator variable in quadrant 2 effects the strength of the relationship, but does not interact with the predictor variable (X) and is not significantly related to either the predictor (X) or the criterion variable (Y). In this situation, the residual or error value is a function of the moderator variable, so that dividing the total sample into two homogeneous groups by taking into account the error variance will increase the predictive value of the model. This type of moderator is called a homologizer

variable. The strength of the relationship between Y and X depends on the size of the error term. The greater value of the error term, the smaller the level of strength of the relationship between Y and X and vice versa.

Credit risk testing moderates capital adequacy (X1) to financial performance (Y)

Table 11. First Regression Output

Model Summary ^b								
Model	R	R Square	Adjusted Square	R	Std. Error of the Estimate			
1	$.494^{a}$.244	.237		.85254			
a. Predicto	ors: (Constant), C.	AR						
b. Depende	ent Variable: ROA	1						

Based on Table 11. showing the first regression output value can be seen from the R Square value of 24.4%.

Table 12. Second Regression Output

	Model Summary ^b										
Model	R	R Square	Adjusted R Square	Std.	Error	of	the				
	•				Estimate						
1	.519ª	.269	.256	.84189)						
a. Predicte	a. Predictors: (Constant), CAR.NPL, CAR										
b. Depend	b. Dependent Variable: ROA										

Based on Table 12. showing the value of the first regression output can be seen from the value of R Square of 26.9% so that it can be concluded that with the credit risk (moderating variable) will be able to strengthen the relationship of capital adequacy to financial performance.

Credit risk testing moderates loan to deposit ratio (X2) to financial performance (Y)

Table 13. Output Regresi Pertama

Model Summary ^b								
Model	R	R Square	Adjusted R Square	Std. Error	of	the		
				Estimate				
1	.017a	.000	009	.98010				
a. Predicto	ors: (Constant),	LDR						
b. Dependent Variable: ROA								

Based on Table 13. showing the first regression output value can be seen from the R Square value of 0%.

Table 14. Output Regresi Kedua

Model Summary ^b							
Model	R	R Square	Adjusted R Square	Std.	Error	of	the
		-	, ,	Estim	ate		
1	.183ª	.033	.016	.9680	4		
a. Predicte	a. Predictors: (Constant), LDR.NPL, LDR						
b. Dependent Variable: ROA							

Based on Table 14, the output value of the first regression can be seen from the R Square value of 3.3% so it can be concluded that the presence of credit risk (moderating variable) will be able to strengthen the relationship between loan to deposit ratio and financial performance.

Credit risk testing moderates capital adequacy (X1) and loan to deposit ratio (X2) on financial performance (Y)

Based on Table 15. showing the first regression output value can be seen from the R Square value of 24.5%. Based on Table 16. showing the value of the first regression output can be seen from the value of R Square of 28.6% so that it can be concluded that with the presence of credit risk (moderating variable) will be able to strengthen capital adequacy and loan to deposit ratio to financial performance.

Table 15. First Regression Output

Model Summary ^b							
Model	R	R Square	Adjusted R Square	Std. Error	of	the	
		•	, ,	Estimate			
1	.495a	.245	.231	.85565			
a. Predicto	ors: (Constant),	LDR, CAR					
b. Depend	ent Variable: Re	OA					

Table 16. Second Regression Output

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.535ª	.286	.253	.84342

a. Predictors: (Constant), CAR.LDR.NPL, LDR, CAR, LDR.NPL, CAR.NPL

Based on the results obtained, it can be concluded that: 1) Banks must be able to meet capital adequacy standards to protect against risks that may arise in carrying out business activities. If the bank already has sufficient capital, then the bank has sufficient financial resources to guard against potential losses. If the capital adequacy ratio (Capital Adequacy Ratio) can be met, it will be able to increase the bank's ability to increase profits. The results of this study indicate an alignment with previous research conducted by Natasia (2014) as well as with research conducted by Muarif et al. (2021); 2) The Loan to Deposit Ratio that occurred in the banking sector decreased due to the bank's decrease in bad loans that occurred in companies which increased significantly. This is supported by third party funds of Bank Bukopin Tbk in 2019 of Rp 80,813,460,000,000, an increase from 2018 of Rp 76,149,550,000,000 with profit before tax in 2019 of Rp 133,794,000,000, a decrease from 2018 which was Rp 216,335. 000000. This is not in accordance with the increase in third-party funds that can increase pre-tax profit. The results of this study indicate that there is harmony with previous research conducted by DPK (2021) as well as research conducted by Adnan et al. (2016); 3) The risk of credit or bad credit that occurs in the banking sector results in low banking capital, which directly effects the bank's financial performance, especially the bank's profit can experience a decline. The importance of controlling bad loans is high so that bank capital can be appropriately managed so that the bank's financial performance can improve. The results of this study show that they are similar to what Sukma (2013) and Natasia (2014) found in their studies; 4) High credit risk can arise due to the high loan to deposit ratio disbursed by the banking management and declining financial performance. This occurs because the credit risk, especially bad loans, occurs in high banks due to the loan to deposit ratio funds distributed to the public, and the return is bad so that profits decline, indicating that financial performance is becoming less good. Hasil penelitian ini menunjukkan adanya keselarasan dengan penelitian sebelumnya yang dilakukan oleh Nurrajani (2018) serta pada penelitian yang dilakukan oleh Putri (2013); 5) Banking has limited capital that can be channeled to the public so that it can increase higher profits and higher credit distribution to the community so as to increase higher profits, but banks with large capital more often face high credit risk due to bad loans from the loans that are distributed. The results of this study indicate an alignment with previous research conducted by Natasia (2014) as well as research conducted by Risal (2019).

Conclusion

Based on the results of the study, it can be drawn some conclusions as follows: 1) Capital adequacy effects financial performance in banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019; 2) Loan to deposit ratio has no effect on financial performance in banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019; 3) The existence of credit risk (moderating variables) will be able to strengthen the relationship of capital adequacy to financial performance in banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019; 4) The existence of credit risk (moderating variables) will be able to strengthen the loan to deposit ratio relationship to financial performance in banking companies listed on the Indonesia Stock Exchange for the period of 2015 to 2019.

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b. Dependent Variable: ROA

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