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The Effect of CAR, NPL, LDR, and BOPO On ROA in Banking Companies Listed in Indonesia Stock Exchange Period 2011 - 2016

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Abstract

This test aims to determine how the influence of Capital Adequacy Ratio, Non Performing Loans, Loan to Deposit Ratio and Operating Expenses on Operational Income to Return On Assets. This type of research is quantitative research. The population of the banking sector is 23 companies, over a period of 6 years. The sample technique is purposive random sampling method. The results showed that partially the Capital Adequacy Ratio had a positive and insignificant effect on Return on Assets, Non Performing Loans and Operational Expenses on Operational Income had a negative and significant effect on Return on Assets, Loan to Deposit Ratio had a positive and insignificant effect on Return on Assets. The amount of variation in Return On Assets that can be explained by the independent variables used is 54.1% and 45.9% can be explained by other variables such as Cash Position, and others.

Keywords: Capital Adequacy Ratio, Non Performing Loan, Loan to Deposit Ratio, Operating Expenses to Operating Income and Return on Assets.

1. Introduction

The criteria for national development are economic development that focuses on the government where development is carried out in two terms, namely short and long. After time, the development of economic development cannot be separated from the variety of financial institutions, so that the development of the economic sector remains a top priority. One of the largest contributing economic development agencies is the bank.

The bank is a financial intermediary institution whose activities are to collect funds from the public (savings) and channel them to the public (credit funds), with the aim of advancing the standard of living of the community. the activities of each bank to collect funds from the public and channel them back. The fact is very inversely proportional to the rules that have been established in banking. This can have a negative impact on bank performance and the level of public trust in banks. To maintain customer trust, banks must be able to maintain their financial performance. Bank financial performance can be seen from various indicators, one of which is bank financial statements. From the financial statements we can find out all financial ratios to be used as a reference for assessing the soundness of the banking system. The bank health assessment version of Bank Indonesia is Capital, Assets, Quality, Management, Earning, Liquidity and Sensitivily, while this test uses financial ratios.

Financial ratios are financial analysis tools that can provide an explanation of the financial performance between the two or more types of financial data and the results are numbers (percentages or times). Return on Assets (ROA) is a profitability ratio that estimates the efficiency of banks in obtaining profits or income from all asset data sources. Assets are the entire company's assets obtained from several capital. Capital is its own or other capital that the company has set as assets of the company that can be used for the life of the company or others.

Table 1. Return on Assets for Commercial Banks Period 2011 - 2016 (in percent)

No	Bank Name	ROA					
		2011	2012	2013	2014	2015	2016
1	PT Bank Rakyat Indonesia, Tbk	4.93	5.15	5.03	4.73	4.19	3.84
2	PT Bank Mandiri, Tbk	3.37	3.55	3.66	3.57	3.15	1.95
3	PT Bank Central Asia, Tbk	3.80	3.60	3.80	3.90	3.80	4.00
4	PT Pan Indonesia Bank, Tbk	2.02	1.96	1.85	1.79	1.31	1.69
5	PT Bank Danamon Indonesia, Tbk	3.59	2.64	2.25	1.37	1.31	1.60
6	PT Bank Mega, Tbk	2.29	2.74	1.14	1.16	1.97	2.36
7	PT Bank Bukopin, Tbk	1.87	1.83	1.78	1.23	1.39	1.38

Source: Bank Published Financial Reports (Annual Report)

From table 1, the sample of Return on Assets data from some commercial banks in Indonesia states that the value fluctuates. A very good bank standard in measuring ROA for Bank Indonesia measures> 1.5%. The greater the ROA of the bank, the greater the level of profit the bank earns. Thus, Bank BRI, Mandiri, and BCA in 2011 - 2016 had an average ROA that exceeded bank standards. Bank Panin, Danamin and Mega in 2013 experienced a quite high decline but and in 2016 experienced another increase. Bank Bukopin in 2011 - 2016 had an average ROA below standard.

CAR, NPL, LDR, and BOPO can also affect the fluctuating ROA value. CAR (Capital Adequacy Ratio) is a ratio aimed at measuring bank capital to determine the ability of banks to reserve or prepare funds aimed at avoiding possible risk of loss. The higher the CAR value, the better the bank's soundness level. NPL (Non Performing Loan) is a ratio aimed at assessing a bank's ability to cover credit risk repayment by debtors. The higher the NPL value, the higher the credit risk borne by the bank. LDR (Loan to Deposit Ratio) is a ratio aimed at measuring a bank's ability to provide funds to third parties. The main activity of banks is channeling credit funds. The higher the LDR, the less liquid a bank lends its funds because the greater the distribution of funds to third parties. BOPO (Operating Costs to Operating Income) is a ratio aimed at describing the efficiency of banking in its activities and aims to become a benchmark for banks in managing their operational costs / expenditures. The higher the BOPO, the less effective bank operations are.

2. Methodology

Research Design

The research design is a quantitative study in which financial reports are prepared from 43 commercial banks with the largest assets listed on the Indonesia Stock Exchange.

Population and Sample

Population

The population used in this study were 43 banks which were examined from all commercial banks on the Indonesia Stock Exchange.

Sample

Populations that have special characteristics are called samples, Sugiono (2017). Sampling was carried out by means of purposive random sampling, namely determining the sample with predetermined conditions, Sugiono (2017).

Data Analysis Technique

Multiple Linear Regression Analysis

The multiple linear regression test is used as follows:

$$Y = a + b1X1 + b2X2 + b3X3 + b4X4 + e$$

Information:
Y: ROA
a: constant
X1: CAR variable
X2: Variable NPL
X3: LDR variable
X4: Variable BOPO
b1 - b4: Variable regression coefficient X1 - X2 e: error

Prerequisite Test (Classic Assumption Test)

1. Normality Test
Having a goal in knowing whether or not there are confounding / residual variables that are normally distributed, stated by Ghozali (2016: 154-158).

2. Multicollinearity Test
According to Ghozali (2016: 103 - 104), the multicollinearity test functions in assessing a hypothesis that has correlation between independent variables.

3. Heteroscedasticity Test
This test serves to find out what is contained in the regression model that does not have a variance equation in the residuals of one other observation test, stated by Ghozali (2016: 154-158).

4. Autocorrelation Test
Ghozali's statement (2016: 108) states that the autocoleration test has a function in a linear regression equation that has a correlation between period t and t - 1.

F Test (Simultaneous Test)

The F test is carried out to see the effect of the independent variables together on the dependent variable.

T Test (Partial Test)

A significant t test on the regression coefficient is needed so that it is known whether the independent variable (X) is significant or not the dependent variable (Y), by Ghozali (2016: 99).

R2 test (coefficient of determination)

Expert Ghozali (2016: 95) reveals that the variable of determination is directed to calculate the extent of the regression ability to explain related variations. If the determination variable (R^2) increases, the independent variable has a high value for the variable.

3. **Results and Discussion**

Research Result

Descriptive Statistics

The data processing performed on a sample of 138 banking company reports will be analyzed using descriptive statistics. Descriptive statistics describe the min., Max., Mean and std deviation values for each research variable.

Table 2. Descriptive Statistics

N		Min	Max	Mean	Std. Deviasi
CAR	138	10.25	26.21	17.4341	3.39527
NPL	138	.06	5.31	1.5764	1.03464
LDR	138	43.79	110.49	83.7892	11.40939
BOPO	138	14.41	85.95	48.5859	13.54797
ROA	138	.16	4.46	1.8983	.98311
Valid N (listwise)	138				

Information:
1. CAR totaling 138 data, the value of min. 10,25, max. 26, 21, the mean is 17.4341 and the deviation is 3.39527.
2. NPL totaling 138 data, value min. 0.06; max. 5,31; mean 1.5764 and deviation 1.03464.
3. LDR totaling 138 data, min. 43.79; max. 110.49; mean 83.7892 and deviation 11.40939.
4. BOPO totaling 138 data, value min. 14.41; max. 85.95; mean 48.5859 and deviation 13.54797.
5. ROA totaling 138 data, value min. 0.16; max. 4.46; mean 1.8983 and deviation 0.98311.

Classic Assumptions

Normality

This normality can be tested with a one-sample Kolmogorov-Smirnov with the criteria for a significant value> 0.05 normal data. The tests are:

Table 3. One-Sample Kolmogorov - Smirnov Test

N		138
Normal Parameters[a,b]	Mean	.0000000
	Std. Deviation	.65653440
Most Extreme Differences	Absolute	.048
	Positive	.043
	Negative	-.048
Test Statistic		.048
Asymp. Sig. (2-tailed)		.200[c,d]

a. Test distribution is Normal.
b. Calculated from data.
c. Lilliefors Significance Correction.
d. This is a lower bound of the true significance.

The data above is normally distributed for CAR, NPL, LDR, BOPO, and ROA with sig above 0.05.
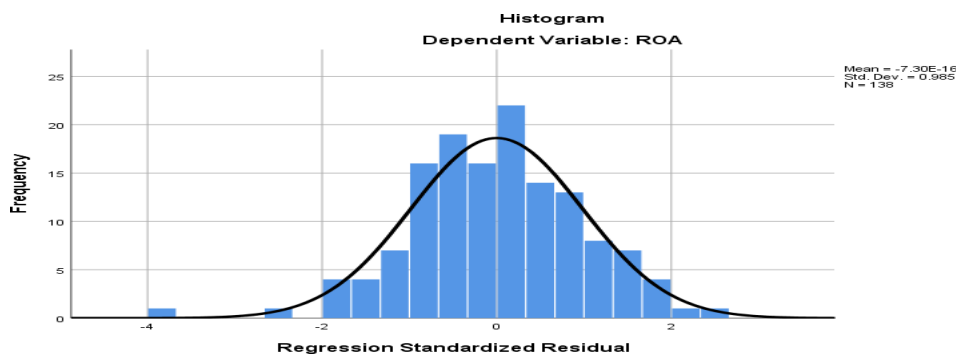The data histogram can be seen below:

Histogram
Dependent Variable: ROA

Mean = -7.30E-16
Std. Dev. = 0.985
N = 138

Figure 1. Histogram Normality Test

Normal data where the histogram direction is not tilted to the right or left and forms an inverted bell.
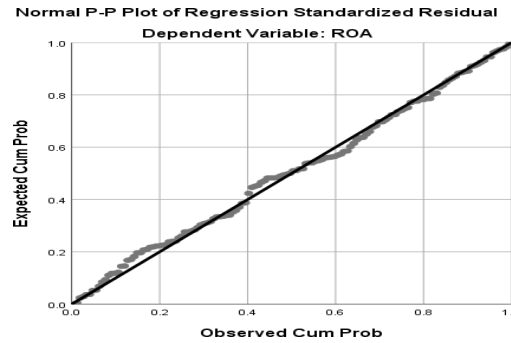The following normal probability plot:

Figure 2. Normal Probability Plot Test

Normal data with points following and approaching the diagonal line.

Multicollinearity Test

Multicollinearity with criteria of VIF value <10 and a tolerance value> 0.10 so that multicollinearity does not occur. The test:

Table 4. Multicollinearity Test Results

Model		Collineari ty Statistics	
		Tolerance	VIF
1	(Constant)		
	CAR	.950	1.053
	NPL	.944	1.060
	LDR	.913	1.095
	BOPO	.892	1.121

All of the research variables met the criteria for VIF <10 and value tolerance> 0.10 for no multicollinearity.

Autocorrelation Test
Autocorrelation test with Durbin Watson with criteria du <dw <4- du.

Table 5. Autocorrelation Test Results

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.744ᵃ	.554	.541	.66633	2.497

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

b. Dependent Variable: ROA

Table 5 shows that the CAR, NPL, LDR, BOPO obtained were 2.497. The measurement results are the number of samples of 138, dl = 1.6628 and du = 1.7819. 1.7819 <DW <4- 1.7819 means that it doesn't happen autocorrelation or 1.7819 <2.497> 4 - 1.7819, 1.7819 <2.497> 2.2181 does not seem to meet the autocorrelation criteria. Then tested by run-test for autocorrelation.

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Table 6. Test Runs

Unstandardized Residual	
Test Value[a]	.00890
Cases < Test Value	69
Cases >= Test Value	69
Total Cases	138
Number of Runs	80
Z	1.709
Asymp. Sig. (2-tailed)	.087

a. Median

The test result run-test is above 0.05 so it is not affected by autocorrelation.

Heteroscedasticity Test

Testing of scatterplot charts that meet the criteria by randomly spreading.
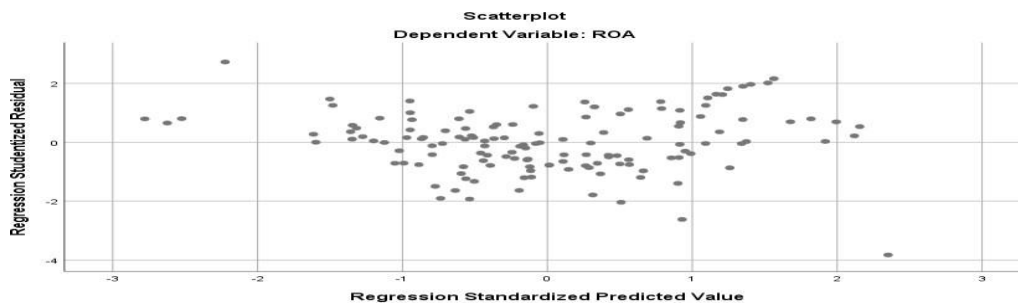

Figure 3. Heteroscedasticity Test

The scatterplot fulfills the criteria by spreading it randomly.
In addition to the scatterplot graph, glejser can be done with sig criteria above 0.05.

Table 7. Glejser Test Results

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	1.120	.395		2.835	.005
	CAR	-.002	.011	-.020	-.231	.818
	NPL	.014	.035	.034	.393	.695
	LDR	-.003	.003	-.074	-.838	.404
	BOPO	-.008	.003	-.245	-2.749	.007

a. Dependent Variable: Abs_ut

This table cluster does not meet the criteria of having a sig above 0.05 and a sig below 0.05.

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Park testing meets the sig criteria above 0.05.

Table 8. Park Test Results
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.690	2.423		.285	.776
	CAR	-.013	.065	-.018	-.199	.842
	NPL	-.036	.215	-.015	-.167	.867
	LDR	-.016	.020	-.071	-.797	.427
	BOPO	-.030	.017	-.160	-1.764	.080

a. Dependent Variable: LNU2I

Park meets the criteria of sig above 0.05
Results of Data Analysis
Multiple Linear Regression Analysis
Multiple linear regression analysis explains the prediction of changes in the increase or decrease of two variables.

Table 9. Results of Multiple Linear Regression Analysis
Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	4.941	.638		7.741	.000
	CAR	.013	.017	.044	.744	.458
	NPL	-.185	.057	-.195	-3.268	.001
	LDR	-.006	.005	-.070	-1.147	.253
	BOPO	-.051	.004	-.701	-11.440	.000

a. Dependent Variable: ROA

Based on table 3.8 above, the regression formula is obtained as follows: ROA = 4.941 + 0.013 CAR - 0.185 NPL - 0.006 LDR - 0.051 BOPO
1. The a value of 4,941 units states that CAR, NPL, LDR, OEOI, and ROA are zero so that the ROA is 4,941 units.
2. The CAR coefficient is 0.013 units and positive shows that an increase in CAR every one unit can increase ROA by 0.013.
3. The NPL coefficient is 0.185 units and negative indicates that an increase in NPL for each unit can reduce ROA by 0.185.
4. The LDR coefficient is 0.006 units and negative indicates that an increase in LDR for each one unit can reduce ROA by 0.006.

5. The BOPO coefficient is 0.051 units and negative indicates that an increase in BOPO per unit can reduce ROA by 0.051.

Coefficient of Determination (R²)

The coefficient of determination explains the strength and weakness of the relationship between the independent and dependent variables.

Table 10. Coefficient of Determination
Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.744[a]	.554	.541	.66633

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

Based on Table 10 above the adjusted R Square (R2) is worth 0.541 or 54.1% which affects ROA and the remaining 45.9% is influenced by other variables such as cash turnover, NIM and Third Party Funds (TPF).

Statistical Test F

The F test simultaneously tests its effect on the dependent.

Table 11. Statistical Test Results F
ANOVA[a]

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	73.358	4	18.339	41.305	.000[b]
	Residual	59.052	133	.444		
	Total	132.410	137			

a. Dependent Variable: ROA

b. Predictors: (Constant), BOPO, NPL, CAR, LDR

From Table 11 above, Fcount is worth 41.305 with a significant value of 0.000 and Ftable is worth 2.44 (138-4-1 = 133) then H0 is rejected and H1 is accepted along with a significant value of 0.000 <0.05 so that the Capital Adequacy Ratio (CAR), Non Performing Loans (NPL), Loan to Deposit Ratio (LDR) and Operational Expenses to Operating Income (BOPO) have a positive and significant effect on Return on Assets (ROA) of banking companies listed on the Indonesia Stock Exchange (IDX) for the period 2011 - 2016.

Test Statistic T

The t test tests the individual's influence on the dependent.

Table 12. Statistical Test Results t

Coefficients[a]

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	4.941	.638		7.741	.000
	CAR	.013	.017	.044	.744	.458
	NPL	-.185	.057	-.195	-3.268	.001
	LDR	-.006	.005	-.070	-1.147	.253
	BOPO	-.051	.004	-.701	-11.440	.000

a. Dependent Variable: ROA

The results of partial statistical tests are as follows:

1. The Capital Adequacy Ratio (CAR) ttable value is 1.977 (138-4 = 134) with a significant value of 0.458 and the tcount value of 0.744. Capital Adequacy Ratio (CAR) with tcount (0.744) <ttable value (1.977) and significance value (0.458)> 0.05 so that Capital Adequacy Ratio (CAR) has no positive and insignificant effect on Return on Assets (ROA) to the company banks listed on the Indonesia Stock Exchange (IDX) for the period 2011 - 2016.
2. The t-table value of Non Performing Loans (NPL) is 1.977 (138-4 = 134) with a significant value of 0.001 and the tcount value of -3.268. Non Performing Loan (NPL) with tcount (-3.268) <ttable value (-1.977) and a significance value (0.001) <0.05 so that Non Performing Loans (NPL) have a negative and significant effect on Return on Assets (ROA) to the company banks listed on the Indonesia Stock Exchange (IDX) for the period 2011 - 2016.
3. The t-table value of the Loan to Deposit Ratio (LDR) is 1.977 (138-4 = 134) with a significant value of 0.253 and the tcount value of -1.147. Loan to Deposit Ratio (LDR) with tcount (-1.147)> ttable value (-1.977) and significance value (0.253)> 0.05 so that the Loan to Deposit Ratio (LDR) has no positive and insignificant effect on Return on Assets (ROA) against banking companies listed on the Indonesia Stock Exchange (IDX) for the period 2011 - 2016.
4. The ttable value of Operational Expenses to Operating Income (BOPO) is 1,977 (138-4 = 134) with a significant value of 0,000 and a tcount of -11,440. Operating Expenses to Operating Income (BOPO) with tcount (-11,440) <ttable value (-1,977) and significance value (0,000) <0.05 so that Operational Expenses to Operating Income (BOPO) have a negative and significant effect on Return on Assets (ROA) against banking companies listed on the Indonesia Stock Exchange (IDX) for the period 2011 - 2016.

Capital Adequacy Ratio

Based on the test, it shows a negative and insignificant effect on Return on Assets (ROA). This study is in line with the research of Luh Putu Sukma (2015), namely that CAR has a negative and insignificant effect on ROA.

CAR is measured by the ratio between own capital divided by Risk Weighted Assets (RWA).

Non Performing Loan

Based on the test, it shows a negative and significant effect on Return on Assets (ROA). This research is in line with Ponco's research, Budi (2008) that CAR has a negative and insignificant effect on ROA. NPL is measured by the ratio of bad loans divided by total loans.

Loan to Deposit Ratio

Based on the test, it shows a positive and insignificant effect on Return on Assets (ROA). This study is in line with the research of Luh Putu Sukma (2015), namely that CAR has a positive and insignificant effect on ROA. LDR is measured by the ratio of total loans divided by third party funds.

Operating Expenses Against Operating Income

Based on the test, it shows a negative and significant effect on Return on Assets (ROA). This study is in line with Ponco's research (2008), namely that CAR has a negative and insignificant effect on ROA. BOPO is measured by the ratio of total interest expense divided by total interest income.

4. Conclusion

Capital Adequacy Ratio (CAR) has no positive and insignificant effect on Return on Assets (ROA) of banking companies listed on the IDX for the period 2011 - 2016.

Non Performing Loans (NPL) have a negative and significant effect on Return on Assets (ROA) of banking companies listed on the IDX for the period 2011 - 2016.

Loan to Deposit Ratio (LDR) has no positive and insignificant effect on Return on Assets (ROA) of banking companies listed on the IDX for the period 2011 - 2016.

Operational Expenses to Operational Income (BOPO) have a negative and significant effect on Return on Assets (ROA) of banking companies listed on the IDX for the period 2011 - 2016.

Capital Adequacy Ratio (CAR), Non Performing Loan (NPL), Loan to Deposit Ratio (LDR) and Operating Expenses to Operating Income (BOPO) have a positive and significant effect on Return on Assets (ROA) of banking companies listed on the IDX 2011 - 2016 period.

It is advisable for the management to increase banking capital so that the company's operational activities can run well. The company's capital should be based on the profits that the company gets.

It is advisable for management to minimize and be more vigorous in extending credit to customers in order to avoid a high increase in bad credit.

On the other hand, the management needs to increase the company's LDR by following lending procedures, especially customers who will be given credit must be selected according to procedures so as not to cause high bad credit.

It is recommended that management minimize OEOI to increase ROA, that is, the bank should increase BOPO as efficiently as possible and high BOPO indicates that the company incurs high operating costs to generate profits so that it is not efficient.

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