

# The effect of operational efficiency on profitability in BUMN banks registered in Indonesia Stock Exchange (IDX) 2011-2018

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**Abstract:** This research aims to determine the effect of operational efficiency using the ratio: CAR, LDR, BOPO and NPL to the profitability (ROA) of state-owned banks consisting of Bank Mandiri, BNI, BRI and BTN. This study uses secondary data from the Indonesia Stock Exchange (IDX) in 2011-2018. This research is a quantitative research through panel data regression method with data processing using the STATA application. The results of this study indicate that from the 4 ratios that exist simultaneously affect profitability (ROA). But only BOPO has a significant influence on ROA while CAR, LDR and NPL do not have a significant effect on ROA. BOPO theoretically relates directly to bank income and expenditure which has a direct impact on ROA.

**Key Words:** ROA, CAR, LDR, BOPO, NPL.

## 1. INTRODUCTION:

Efficiency can be used to measure the financial performance of a company that can be reflected in financial statements. Analysis of financial statements can be done to find out the company's financial performance. One of the tools used to analyze financial statements is ratio analysis. One function of the bank is to channel third party funds into credit. In carrying out these functions inherent in credit risk is the risk of failure in fulfilling its obligations or better known as a non-performing loan (NPL). NPL reflects credit risk borne by the bank. so that the bank's value towards this ratio is good, Bank Indonesia sets the criteria for net NPL ratios below 5%. To measure banking financial performance we can use the ratio: capital adequacy ratio (CAR), loan to deposit ratio (LDR), operating income operating expenses (BOPO), non-performing loans (NPL), Return on Assets, and Return on equity.

In the midst of the economy, the more difficult the BUMN banking financial performance has decreased in the CAR ratio. This indicates that state-owned banks experienced a decline in the capital adequacy ratio. From the calculated data, the decline occurred in 2017-2018. Bank Mandiri's CAR ratio in 2017 amounted to 21.64%, down to 20.96% in 2018. BRI and BBTN also recorded a decrease in the CAR ratio in 2018, which was from 22.96% & 18.86% in 2017 to 21.21% & 18.21% respectively. in 2018. Also found were still banks with LDR above 100%.

Operational efficiency shows the level of profitability of the company. The more efficient the company, the higher the profitability. The operational efficiency of the bank refers to the bank's main objectives as a front office to reach the market by selling banking financial products to new customers / debtors and simultaneously providing services to existing customers / creditors using the available resources optimally. According to Ahmeti et. al (2014) to measure profitability performance (profit-flow) is: Return on Assets (ROA - Return on Assets) = Net profit / total assets. Regarding the banking perspective this ratio shows management's ability to attract funds at reasonable costs and their investment in the form of non-profit. This ratio shows how much net income is generated for every Rp1. The higher the ROA, the more profitable the bank is. This ratio shows how well the bank's assets are managed to maximize returns.

The following is conveyed the purpose of this study are: To find out how much influence the company's operational efficiency ratio (CAR, LDR, BOPO and NPL) on Profitability (ROA) in BUMN Banks in 2011-2018.

## 2. LITERATURE REVIEW:

According to Agus (2016) Profitability is the ability of companies to earn profits in relation to sales, total assets and own capital. According to Olalekan (2013) bank profitability is measured by return on assets (ROA), return on equity (ROE), and / or net interest margin (NIM). High and low Return on Assets (ROA) depends on asset management. The higher Return on Assets (ROA), the company's profitability increases and shows better financial performance. Return on Assets (ROA) is one of the profitability ratios. This ratio is used because it is able to show the ability of invested capital of the entire asset to generate profits. The higher the ratio, the better (Artaningrum, 2017)

According to Kumar et. al (2012) said efficiency is a combination of growth, performance, productivity, profitability, and technical efficiency. The overall banking business has been given more emphasis on deposit mobilization, credit deployment and branch expansion. While the research conducted by Funso et. al (2012) measures the factors that influence the profitability of banks in Hong Kong. In the case of specific bank factors, operational

efficiency is the most important factor in explaining differences in profitability at the bank. According to Subandi (2014) the factors that influence the operational efficiency of banks in Indonesia are CAR, LDR, NPL, BOPO and NIM.

Capital Adequacy Ratio (CAR) is a capital adequacy ratio that functions to accommodate the risk of losses that might be faced by banks. The higher the Capital Adequacy Ratio (CAR), the better the bank's ability to bear the risk of any risky credit / productive assets (Indriastuti, 2019). All banks in Indonesia are required to provide a minimum capital of 8% of RWA. CAR is calculated by the formula:  $CAR = (\text{Capital} / \text{Risk-weighted Assets}) \times 100\%$ .

LDR is the ratio between the amount of the entire volume of credit channeled by the bank and the amount of funds received from various sources. Loan to Positive Ratio (LDR) shows the amount of credit given which is funded by third party funds. The size of a bank's Loan to Deposit Ratio (LDR) will affect the bank's profitability (Indriastuti, 2019). LDR is calculated by the formula:  $LDR = (\text{Total Credit} / \text{Total Third Party Funds}) \times 100\%$

According to Ginting (2019) LDR is a financial ratio of a banking company that is related to the liquidity aspect of a measurement that shows time deposits, demand deposits and savings, which are used to fulfill the loan requests of its customers. This ratio is intended to measure how much loan funding provided by banks comes from third party funds.

According to Putra (2016) Non Performing Loans (NPL) is a ratio to measure the ability of bank management to overcome non-performing loans provided by banks. From the results of his research on BUMN banks in 2010-2014, it was found that the NPL had a positive and not significant effect on ROA. BOPO (Operating costs against operating income). NPL is calculated by the formula:  $NPL = (\text{Troubled Credit} / \text{Total Credit}) \times 100\%$ .

According to Syakhrun (2019) BOPO is the ratio of the ratio of operating costs to operating income, the lower the level of the BOPO ratio means the better the performance of the bank's management, because it is more efficient in using existing resources in the company. Efficiency / Health Criteria are <93.5% (healthy) and > 93.5% (unhealthy). Bopo is calculated by the formula:  $Bopo = (\text{Operating Expenses} / \text{Operating Income}) \times 100\%$ .

Based on the Literature Review, as well as referring to previous studies that are still relevant, a theoretical framework can be drawn which can be seen in the following:

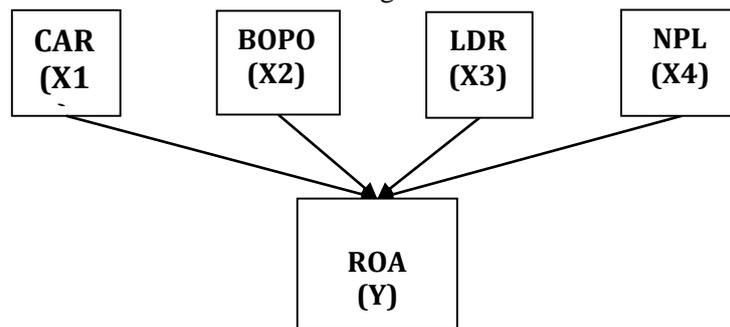


Figure 1. Theoretical Framework

A hypothesis is a statement about something that is temporarily considered true. Besides that, the hypothesis can be interpreted as a statement that will be examined as a temporary answer to a problem. Based on the formulation of the problem, objectives, theories, previous research, and the framework of the thinking, the hypothesis in this study are:

- H1: CAR has a positive effect on ROA of BUMN Banks
- H2: LDR has a positive effect on ROA of BUMN Banks
- H3: BOPO has a positive effect on ROA of BUMN Banks
- H4: NPL has a positive effect on ROA of BUMN Banks

### 3. METHOD:

#### Population and Samples

The population in this study is Banking in Indonesia and the sample is BUMN banks listed on the Indonesia Stock Exchange (IDX) in the 2011-2018 period, totaling 4 banks, namely Bank Mandiri, BRI, BNI and BTN. Sampling is done by purposive sampling method.

#### Data collection technique

Data collection techniques used in this study are documentation techniques. The author collects data related to CAR, BOPO, LDR, NPL, ROA, State-Owned Banks listed on the IDX

#### Operational Variables

In this study to measure the effect of operational efficiency ratio on ROA, the variables used are:

1. Free Variables (Independent) there are four, namely CAR (X1), LDR (X2), BOPO (X3) and NPL (X4)

2. Bound variable (Dependent), namely ROA (Y).

**Data analysis technique**

The data analysis used in this study is multiple linear regression analysis. Multiple linear regression is a test used to determine the magnitude of the influence of each independent variable (dependent) on the dependent variable (dependent) and can predict the value of the dependent variable, if all the independent variables are known value. The formula used in this study is

$$Y_{i,t} = a + b_1 CAR_{i,t} + b_2 BOPO_{i,t} + b_3 LDR_{i,t} + b_4 NPL_{i,t} + e$$

Information :

Y = Profitability (ROA)

a = Constant

b<sub>1,2,3,4</sub> = Regression Coefficient

CAR = Capital Adequency Ratio

BOPO = Operating Costs for Operational Income

LDR = Loan to Deposit Ratio

NPL = Non Performing Loan

e = error or residual standard

i = share i

t = year t

**4. ANALYSIS:**

**Descriptive statistics**

The description of this research variable is intended to see the characteristics of the variables studied. In this study there are four independent variables namely CAR, BOPO, LDR, and NPL, while the dependent variable is ROA. This study aims to analyze the effect of independent variables on the dependent variable. This study uses annual data for 8 years, namely from 2011 to 2018.

**Table 1. Description of Research Variable Statistics**

Summarize ROA NPL LDR BOPO CAR					
Variable	Obs	Mean	Std. Dev	Min	Max
ROA	32	3.02	1.11	1.14	5.15
NPL	32	2.50	0.70	1.55	4.01
LDR	32	89.26	10.36	70.37	108.86
BOPO	32	72.30	7.85	59.93	88.97
CAR	32	18.08	2.46	14.64	22.96

Source: Stata Output 14.2 (processed), 2019

Based on the table above the ROA variable has a mean (average) of 3.02%. The average BOPO is 72.30%. The average LDR is 89.26%. The average NPL is 2.50%. and the average CAR is 18.08%.

**CLASSIC ASSUMPTION TEST**

**Normality test**

A normality test is carried out to determine whether a data distribution follows or approaches a normal distribution. Good data is data that has a pattern like a normal distribution.

**Table 2. Normality Test**

.skatest ROA NPL LDR BOPO CAR					
skewness/Kurtosis test for Normality					
----- joint -----					
Variable	OBs	Pr (Skewness)	Pr (Kurtosis)	adj chi (2)	Prob>chi2
ROA	32	0.73	0.5	0.62	0.73

NPL	32	0.12	0.63	2.83	0.24
LDR	32	0.41	0.5	1.24	0.54
BOPO	32	0.2	0.26	3.2	0.2
CAR	32	0.32	0.18	3.07	0.22

Source: Stata Output 14.2 (processed), 2019

From table 2 it can be seen that the test results state that the value of Prob> chi2 for each variable is above the value of significance with some variables carried out data transformation. With these results, it can be stated that the data used in this study has been normally distributed, because the significance value of the normality test for each variable is greater than 0.05.

**Multicollinearity Test**

Multicollinearity test is needed to determine whether there are independent variables that have similarities with other independent variables in one model. To see whether there is collinearity, it will be seen from the value of the variance inflation factor (VIF). If the VIF value is less than 10 (VIF <10) or tolerance value is greater than 0.10, it will be concluded that the model has no symptoms of multicollinearity. The following are the Multicollinearity test results obtained:

**Table 3. Multicollinearity Test**

. vif		
Variabel	FIV	1/VIF
BOPO	6.64	0.15
LDR	3.23	0.31
NPL	3.12	0.32
CAR	1.08	0.92
Mean VIF	3.47	

Source: Stata Output 14.2 (processed), 2019

From the results of the processing presented in the above it can be seen that all variables have a Tolerance value of more than 0.10 and the Variance inflation factor (VIF) is less than 10, so it can be concluded that there is no multicollinearity between all independent variables.

**Heteroscedasticity Test**

In determining heteroscedasticity can use a scatterplot graph, the points formed must spread randomly, spread both above and below the number 0 on the Y axis, if these conditions are met then heteroscedasticity does not occur and the regression model is feasible to use.

**Table 4. Heteroscedasticity Test Results**

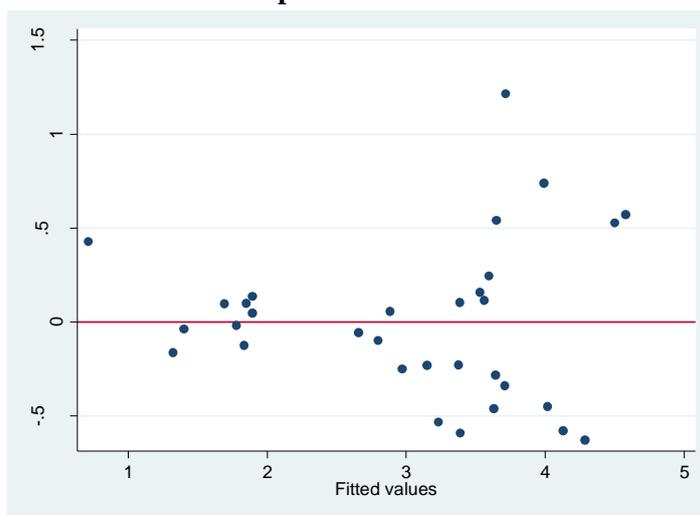
.xtgls ROA NPL LDR BOPO CAR	
Cross-sectional time-series FGLS regression	
Coefficients : generalized least square	
Panels : homoskedastic	
Correlation : no autorrelation	
Estimated covariances = 1	Number of obs = 32
Estimated autocorrelations = 0	Number of groups = 8
Estimated coefficients = 5	Time periods = 4
	Wald chi2 (4) = 191.01
log likelihood = -17.075	Prob > chi2 = 0.00

ROA	Coef	std. Err	z	P > z	[95% Conf. Interval]	
NPL	-0.19	0.19	-0.98	0.33	-0.56	0.19
LDR	-0.01	0.13	-0.43	0.67	-0.30	0.02
BOPO	-0.11	0.02	-4.68	0.00	-0.16	-0.07
CAR	0.02	0.31	0.48	0.63	-0.05	0.08
_Cons	11.82	1.01	11.70	0.00	9.84	13.80

Source: Stata Output 14.2 (processed), 2019

In Table 4 it can be seen that Wald chi2 (4) value is 191.01 with significant probability > chi 2 is 0,000. with general least square can be seen in the table that there is no autocorrelation.

**Graph 1. Scatter Plot**



Source: Stata Output 14.2 (processed), 2019

Based on the graph above, it can be noted that there are no heteroscedasticity symptoms in the model, it can also be seen in graph 5 the points of the pattern spread randomly at the position above or below the number 0 on the Y axis, there are no symptoms of heterocedasticity. .

**Determination Coefficient Test (R<sup>2</sup>)**

This test aims to measure how far the model's ability to explain the dependent variables. The coefficient of determination (R<sup>2</sup>) shows the proportion explained by the independent variable in the model to the dependent variable, the remainder is explained by other variables not included in the model, wrong model formulations and experimental errors.

**Table 5. Determination Coefficient Test (R<sup>2</sup>)**

. reg ROA NOL LDR BOPO CAR						
Source	SS	df	MS	Number of obs = 32		
Model	32.51	4	8.13	F(4, 27) = 40.29		
Residual	5.45	27	0.2	Prob > F = 0.00		
Total	37.96	31	1.22	R-squared = 0.86		
				Adj R-squared = 0.84		
				Root MSE = 0.45		
ROA	Coef.	std. Err	t	P > t	[95% Conf. Interval]	
NPL	-0.19	0.20	-0.90	0.38	-0.61	0.24
LDR	-0.01	0.13	-0.39	0.70	-0.03	0.02
BOPO	-0.11	0.02	-4.30	0.00	-0.17	-0.06
CAR	0.01	0.03	0.44	0.67	-0.06	0.09
_Cons	11.82	1.01	10.75	0.00	9.56	14.08

Source: Stata Output 14.2 (processed), 2019

Based on Table 5, it can be seen that the adjusted R2 value obtained for model 1 is 0.857, meaning that the ROA of state-owned banks listed on the IDX (2011-2018) can be explained by the independent variables namely CAR, BOPO, LDR and NPL of 85.7% while the remaining 14.3% is explained by other reasons outside the model.

**F Statistics Test**

The F test is performed to show how far the influence of independent variables simultaneously (together) in explaining the variation of the dependent variable using a significant level of 5%.

**Table 6. Test F**

. reg ROA NOL LDR BOPO CAR						
Source	SS	df	MS	Number of obs = 32		
Model	32.51	4	8.13	F(4, 27) = 40.29		
Residual	5.45	27	0.2	Prob > F = 0.00		
Total	37.96	31	1.22	R-squared = 0.86		
				Adj R-squared = 0.84		
				Root MSE = 0.45		
ROA	Coef.	std. Err	t	P > t	[95% Conf. Interval]	
NPL	-0.19	0.20	-0.90	0.38	-0.61	0.24
LDR	-0.01	0.13	-0.39	0.70	-0.03	0.02
BOPO	-0.11	0.02	-4.30	0.00	-0.17	-0.06
CAR	0.01	0.03	0.44	0.67	-0.06	0.09
_Cons	11.82	1.01	10.75	0.00	9.56	14.08

Source: Stata Output 14.2 (processed), 2019

From table 6 it is known that the calculated F value is 40,291. F table with df 1 (k-1) = 4 and df 2 (n-1) = 31 obtained by F table of 2.90. The value of 40.29 > 2.68 with a significance level of 0.000 < 0.05, which means that there is a significant effect together between all the independent variables on the dependent variable.

**Multiple Regression Models**

The multiple regression model in this study is used to express the functional relationship between the independent variable and the dependent variable. The following are the regression results obtained :

**Table 7. Multiple Regression Tests**

. reg ROA NOL LDR BOPO CAR						
Source	SS	df	MS	Number of obs = 32		
Model	32.51	4	8.13	F(4, 27) = 40.29		
Residual	5.45	27	0.2	Prob > F = 0.00		
Total	37.96	31	1.22	R-squared = 0.86		
				Adj R-squared = 0.84		
				Root MSE = 0.45		
ROA	Coef.	std. Err	t	P > t	[95% Conf. Interval]	
NPL	-0.19	0.20	-0.90	0.38	-0.61	0.24
LDR	-0.01	0.13	-0.39	0.70	-0.03	0.02
BOPO	-0.11	0.02	-4.30	0.00	-0.17	-0.06
CAR	0.01	0.03	0.44	0.67	-0.06	0.09
_Cons	11.82	1.01	10.75	0.00	9.56	14.08

Source: Stata Output 14.2 (processed), 2019

Based on Table 7 above, the multiple linear regression equation can be formulated as follows:  
 $ROA_{i,t} = 11.82 + 0.01 CAR_{i,t} - 0.112BOPO_{i,t} - 0.01 LDR_{i,t} - 0.19NPL_{i,t} + e$

The model 1 equation above can be explained as follows: a constant value of 11.82 means that without the CAR, BOPO, LDR, and NPL variables, the ROA value is 11.82. CAR regression coefficient of 0.01 states that each CAR increases by 1%, it will cause an increase in ROA of 0.01. BOPO regression coefficient of -0.11 states that every BOPO increases by 1%, it will cause a decrease in ROA of 0.11. LDR regression coefficient of - 0.01 states that each LDR increases by 1%, it will cause a decrease in ROA of -0.01. Meanwhile, NPL regression coefficient of - 0.19 states that each NPL increases by 1%, it will cause a decrease in ROA of - 0.19.

**Hypothesis Test (T Test)**

The T test is conducted to show how far the influence of independent variables partially (individually) in explaining variations in the dependent variable using a significant level of 5%. The results of testing the significance of independent variables partially as in the discussion as follows:

- a. Variable CAR to ROA shows tcount of 0.44 with a significance of 0.67 (sig> 0.05). This means that CAR does not have a significant effect on ROA. Thus hypothesis 1 is rejected.
- b. Variable BOPO for ROA shows a t-count of -4.30 with a significance of 0.00 (sig <0.05). This means that BOPO has a significant influence on ROA. Thus hypothesis 2 is accepted.
- c. Variable LDR to ROA shows tcount of -0.39 with a significance of 0.70 (sig> 0.05). This means that the LDR does not have a significant effect on ROA. Thus hypothesis 3 is rejected.
- d. Variable NPL on ROA shows tcount of -0.90 with a significance of 0.38 (sig> 0.05). This means that the NPL does not have a significant effect on ROA. Thus hypothesis 4 is rejected.

The partial test results of the four independent variables on the dependent variable are summarized in the following table:

**Table 8. Overview of Hypothesis Tests on ROA**

Variabel	t hitung	Signifikan	Keputusan
CAR	0.44	0,67	H1 Ditolak
BOPO	-4.30	0,00	H2 Diterima
LDR	-0.39	0,70	H3 Ditolak
NPL	-0.90	0,38	H4 Ditolak

Source: Stata Output 14.2 (processed), 2019

**5. RESULT:**

**Effect of CAR on ROA at BUMN Banks**

Partially there is no significant influence between the CAR variable and ROA so hypothesis 1 is rejected. This result is in line with previous research conducted by Patwary & Tasneem (2019), Poerwanti (2018), Indriastuti, et al (2018), Ginting (2019) and Mawardi (2005) also showing that CAR does not have a significant effect on ROA. The test results of this variable do not match the existing theory, this is likely to occur because of the average state-owned bank CAR of 18.07% higher than the minimum CAR required by Bank Indonesia, which is 8%, indicating that the existing capital is not used optimally for lending which is the main source of bank income, banks are more dominant using third party funds (DPK) placed by debtors to be channeled in the form of credit.

**Effect of BOPO on ROA at BUMN Banks**

Partially BOPO to ROA has a significant negative effect. Thus hypothesis 2 is accepted. The negative value shown by BOPO shows that the smaller the BOPO shows the more efficient the bank in carrying out its business activities, a small BOPO indicates that the bank's operational costs are smaller than its operating income so that it shows that bank management is very efficient in carrying out its operational activities. The results of this study support the research conducted by Yolanda (2019), Patwary & Tasneem (2019), Wulandari, et al (2019) and Yuliani, (2007) which showed the results of a negative significant effect of BOPO on ROA.

### Effect of LDR on ROA at BUMN Banks

Partially the hypothesis is rejected which means there is no significant influence between the LDR variable and ROA. It can also mean that the higher the LDR of a bank does not become a benchmark for the success of bank management in gaining high profits. This is contrary to the results of the research conducted, where the LDR has no significant effect on ROA. Yolanda (2019) concluded that LDR had a negative and not significant effect on ROA. The LDR is the ratio between the total amount of credit channeled by the bank and the funds received by the bank. The average LDR of BUMN banks during the study period (2011-2018) has shown good results, namely 89.26%.

### Effect of NPL on ROA at BUMN Banks

Based on the results of partial test calculations obtained there is no significant influence between the variable NPL and ROA. NPLs in state-owned banks have a negative and not significant effect on ROA. The average NPL at state-owned banks is 2.49%. NPLs at state-owned banks, including very good, are below 5% of Bank Indonesia regulations. NPL is a ratio that shows the quality of financing at the bank. BUMN banks have a small NPL ratio which means that state-owned banks have been able to manage financed funds well. NPL at BUMN Banks does not have a significant effect on ROA because BUMN Banks have been able to manage their credit well, so that the loss reserves due to troubled financing will be minimized, so that a small NPL does not cause a significant decrease or increase in profitability (ROA).

## 6. CONCLUSION :

This study aims to examine how the influence of Capital Adequacy Ratio (CAR), Operational Efficiency (BOPO), Non Performing Loans (NPL), and Loan to Deposit Ratio (LDR) to Return on Assets (ROA) as a proxy for BUMN Bank Profitability on the IDX . Based on the results of data analysis and the discussion that has been stated, it can be concluded that only BOPO has a significant effect on the ROA of BUMN banks in 2011-2018 while other variables such as CAR, LDR and NPL do not have a significant effect on ROA.

## 7. SUGGESTION:

Based on result and conclusion of research, the autors recommand:

- For Companies to pay more attention to company cost control and improve company performance so that the company's profitability also increases and attracts investors to invest in the company
- This study only uses four independent variables, while profitability (ROA) may be influenced by other variables, so it is advisable not only to look at the four variables but also to pay attention to other variables and this is one of the limitations of researchers in this study

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