The Effect of CAR, NPL, and LDR on ROA of SOE Banks in Indonesia
(Case Study at a State-Owned Bank Listed on the IDX)

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Abstract
Bank health is an important thing in the banking world, because an unhealthy bank will be a threatmenr for the bank's internal element that affected the customers. This research is to find out and analyze the effect of CAR, NPL and LDR partially or simultaneously on the ROA of BUMN banks, for examples, Bank Mandiri, Bank Negara Indonesia (BNI 46), Bank Rakyat Indonesia (BRI) and Bank Tabungan Negara (BTN) since 2009-2017.
Data collection techniques was by accessing www.idx.com. This type of research was quantitative research. The analytical tool used in this study was multiple linear regression analysis, using E-Views software. Chow Test and Hausman Test was used to choose the best multiple linear regression analysis between Common Effect, Fixed Effect, and Random Effect.The partial test results show that the NPL variable has a significant effect on ROA of state-owned banks in Indonesia. Simultaneous test results show that CAR, NPL and LDR significantly affected ROA
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A. Introduction

The banking industry is an important sector in national development that functions as a financial intermediary between parties who have excess funds (surplus units) and those who need funds (deficit units). This bank institution is called a trust institution which means that the party with excess funds entrusts fully to the bank to manage and distribute funds to those who lack funds. This form of trust is reflected with no interference of fund management that have been placed.

The failed bank will have a large impact and will affect customers and other financial institutions. The failures or bad loans require financial ratio analysis, so that the risk of bank failure can be detected.

The level of bank soundness can be measured by calculating the value of the RGEC component which includes Risk Profile, Good Corporate Governance, Earnings, and Capital. In this case, the Risk Profile aspect is assessed by Non-Performing Loans (NPL) and Loan to Deposite Ratio (LDR), Earning aspect includes the Return On Assets (ROA), while the Capital aspect includes Capital Adequacy Ratio (CAR). These aspects are then assessed using financial ratios, so as to assess the financial condition of banking companies in the future.

Based on the above background, the researcher is interested in raising the theme "Analysis of the effect of office CAR, NPL and LDR on ROA in Conventional Banks in Indonesia (Case Study on BUMN Banks Listed on the IDX)".

B. Theoretical Framework

Banking
In the Indonesian Banking Booklet for 2017, banking is related to bank, for example; institutions, business activities, ways and processes in carrying out their business activities.

Financial Report
Financial report is information that describes the financial condition of a company, and further the information can be used as a picture of the company's financial performance.

Bank Health
The procedure in evaluating the healthy bank used the RGEC (Risk Profile, Good Corporate Governance, Earning and Capital) methods. The full guidelines were regulated in Bank Indonesia Circular Letter (SE) No. 13/14 / DPNP dated 25 October 2011 concerning Commercial Bank Health Assessment.

a. Risk Profile
The risk assessment is divided into 8 parts, namely Credit Risk, Market Risk, Liquidity Risk, Operational Risk, Legal Risk, Strategic Risk, Compliance Risk, and Reputation Risk.

b. Good Corporate Governance
The Bank takes into account the impact of the company's GCG on the bank's GCG performance by considering the significant and materiality of the subsidiary companies and / or the significance of the GCG weaknesses of the subsidiary companies.

c. Earning

Earning is one of the bank's health assessments in terms of profitability. The characteristic of banks in terms of profitability is the bank's performance in generating profits, the stability of the components that support core eraning, and the ability of earnings to improve capital and future profit prospects.

d. Capital

Capital has indicators including bank capital adequacy ratios to anticipate potential losses according to risk profiles, which are accompanied by very strong capital management in accordance with the characteristics, scale of business, and complexity of the bank's business.

Financial Ratios

According to Van Horne, financial ratio is an index that connects two accounting numbers which are obtained by dividing one number by another. Financial ratio is used to evaluate the financial condition and performance of the company. From the results of this financial ratio, the health condition of the company concerned will be seen.

Capital market

According to Fahmi (2015: 48), the capital market is a place where various parties, especially companies sell shares (bonds) and bonds (Bond) that will later be used as additional funds or to strengthen the company's capital.

C. Research methods

Types of research

This study used a quantitative approach. Quantitative approach is a type of research that produces findings that can be reached (obtained) using statistical procedures or other means of quantification (measurement).

Based on the level of explanation of the position of the variable, this research was associative in nature, namely, this study seeks a causal relationship (impact) between the independent variable (X) and the dependent variable (Y).

Operasional Definition

1. CAR (X1) ratio that shows how many the total assets that contains risk by dividing bank capital by risk-weighted assets.
2. NPL (X2) is the ratio of the ratio of total non-performing loans to loans provided by banks.
3. LDR (X3) is the ratio of loans given to funds received by banks (current accounts, savings, deposits).
4. ROA (Y) is a profitability ratio that is used to measure the effectiveness of a company in generating profits by utilizing the total assets it has.

Population, Samples, and Sampling

The population used in this study were banking companies listed on the Indonesia Stock Exchange within the study period (2014 to 2016). The sample in this study was a Bank listed on the Indonesia Stock Exchange with a period of 2014-2016 with the sampling technique used that was Purposive Sampling by determining the complete year data criteria.

Data collection technique

Data collection technique in this study used document analysis techniques. Document analysis technique was used to obtain data on bank financial ratio listed on the Indonesia Stock Exchange for the period 2009 - 2017 and data sourced from bank publication reports.

Data analysis technique

a. Classic assumption test

The classic assumption test is carried out to ensure that there are no multicollinearity, autocorrelation and heteroscedasticity in the study, and are normally distributed.

b. Regression Equations using Multiple Linear Regression The analysis technique that used in this research was multiple linear analysis techniques to obtain a comprehensive picture of the relationship between one variable with another variable. The dependent variable used was Return On Assets (ROA) and the independent variables werr Capital Adequacy Ratio (CAR), Non Performing Loan (NPL), and Loan to Deposit Ratio (LDR).

$Y = a + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + e$

Notes :

Y = Return On Asset

a = A constant

β_1- β_4 = Regression Coefficient

X1 = Capital Adequacy Ratio

X2 = Net Performing Loan

X3 = Loan to Deposit Ratio

E = Error

c. Regression Coefficient (R)

Effect of CAR, NPL and LDR on ROA

This analysis was used to determine the relationship between two or more independent variables (X1, X2, ... Xn)

to the dependent variable (Y) simultaneously.

d. Coefficient of Determination (R2)

The purpose of this analysis was to calculate the amount of influence of independent variables on the dependent variable.

e. Simultaneous Test (F Test)

The significance of the regression model was simultaneously tested by looking at the significance value (Sig) where if the sig value is below 0.05 then the independent variable influences the dependent variable. F-statistic test was used to prove that there was an influence between the independent variables on the dependent variable simultaneously.

f. Partial Test (t test)

The significance test of individual parameters (t) was used to show how far the influence of one independent variable individually in explaining the variation of the dependent variable.

g. Best Multiple Linear Correlation Test (Chow Test and Hausman)

In this study also calculated the effective contribution (SE) used to test which independent variables dominantly influence the dependent variable.

The Chow test was to test which common effect with fixed effect was the best. The Hausman test was to test which fixed effect with Random Effcet was the best. LM test was to test between the common effect with which random effect was the best.

D. Analysis and Discussion

Analysis of Research Results

Based on the table above we get the multiple linear regression equation as follows :

1. Common Effect

Dependent Variable: ROA
Method: Panel Least Squares
Date: 10/16/18   Time: 15:36
Sample: 2009 2017
Periods included: 9
Cross-sections included: 4
Total panel (balanced) observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.895577	0.953817	8.277875	0.0000
CAR	0.002109	0.048402	0.043565	0.9617
NPL	-0.808924	0.131871	-6.134196	0.0000
LDR	-0.030302	0.009134	-3.317487	0.0023

R-squared	0.650895	Mean dependent var		3.083333
Adjusted R-squared	0.618167	S.D. dependent var		1.073927
S.E. of regression	0.663608	Akaike info criterion		2.122189
Sum squared resid	14.09203	Schwarz criterion		2.298136
Log likelihood	-34.19941	Hannan-Quinn criter.		2.183600
F-statistic	19.88769	Durbin-Watson stat		0.460704
Prob(F-statistic)	0.000000			

Y = 7,895 + 0,002X1 - 0,808X2 - 0,030X3

2. Fixed Effect:

Dependent Variable: ROA
Method: Panel Least Squares
Date: 10/16/18   Time: 15:37
Sample: 2009 2017
Periods included: 9
Cross-sections included: 4
Total panel (balanced) observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.436162	0.913837	5.948723	0.0000
CAR	-0.050257	0.027476	-1.829101	0.0777
NPL	-0.462646	0.095161	-4.861744	0.0000
LDR	-0.002320	0.010585	-0.219213	0.8280

Effects Specification				
Cross-section fixed (dummy variables)				

R-squared	0.895860	Mean dependent var		3.083333
Adjusted R-squared	0.874314	S.D. dependent var		1.073927
S.E. of regression	0.380731	Akaike info criterion		1.079216
Sum squared resid	4.203717	Schwarz criterion		1.387122
Log likelihood	-12.42589	Hannan-Quinn criter.		1.186684
F-statistic	41.57876	Durbin-Watson stat		1.452192
Prob(F-statistic)	0.000000			

Y = 5,436 - 0,050X1 - 0,462X2 - 0,002X3

3. Random Effect:

Dependent Variable: ROA
Method: Panel EGLS (Cross-section random effects)
Date: 10/16/18   Time: 15:41
Sample: 2009 2017
Periods included: 9
Cross-sections included: 4
Total panel (balanced) observations: 36
Swamy and Arora estimator of component variances

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.895577	0.547231	14.42822	0.0000
CAR	0.002109	0.024995	0.084364	0.9333
NPL	-0.808924	0.075658	-10.69182	0.0000
LDR	-0.030302	0.005240	-5.782336	0.0000

Effects Specification			S.D.	Rho
Cross-section random			2.54E-06	0.0000
Idiosyncratic random			0.380731	1.0000

Weighted Statistics				
R-squared	0.650895	Mean dependent var		3.083333
Adjusted R-squared	0.618167	S.D. dependent var		1.073927
S.E. of regression	0.663608	Sum squared resid		14.09203
F-statistic	19.88769	Durbin-Watson stat		0.460704
Prob(F-statistic)	0.000000			

Unweighted Statistics				
R-squared	0.650895	Mean dependent var		3.083333
Sum squared resid	14.09203	Durbin-Watson stat		0.460704

Y = 7,895 + 0,002X1 - 0,808X2 - 0,030X3

4. Chow Test

Redundant Fixed Effects Tests
Equation: Untitled
Test cross-section fixed effects

Effects Test	Statistic	d.f.	Prob.
Cross-section F	22.738688	(3,29)	0.0000
Cross-section Chi-square	43.547045	3	0.0000

Cross-section fixed effects test equation:
Dependent Variable: ROA
Method: Panel Least Squares
Date: 10/16/18   Time: 15:40
Sample: 2009 2017
Periods included: 9
Cross-sections included: 4
Total panel (balanced) observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	7.895577	0.953817	8.277875	0.0000
CAR	0.002109	0.043565	0.048402	0.9617
NPL	-0.808924	0.131871	-6.134196	0.0000
LDR	-0.030302	0.009134	-3.317487	0.0023

R-squared	0.650895	Mean dependent var	3.083333
Adjusted R-squared	0.618167	S.D. dependent var	1.073927
S.E. of regression	0.663608	Akaike info criterion	2.122189
Sum squared resid	14.09203	Schwarz criterion	2.298136
Log likelihood	-34.19941	Hannan-Quinn criter.	2.183600
F-statistic	19.88769	Durbin-Watson stat	0.460704
Prob(F-statistic)	0.000000		

Seeing from the probability value of F and Chi-square with the assumption:

1. If the probability value F and Chi-square> α = 5%, then the panel regression test.
2. Data used the Common effect model.
3. If the probability value of F and Chi-square <α = 5%, then the panel regression test.

Correlated Random Effects - Hausman Test
Equation: Untitled
Test cross-section random effects

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	68.216063	3	0.0000

Cross-section random effects test comparisons:

Variable	Fixed	Random	Var(Diff.)	Prob.
CAR	-0.050257	0.002109	0.000130	0.0000
NPL	-0.462646	-0.808924	0.003331	0.0000
LDR	-0.002320	-0.030302	0.000085	0.0023

Cross-section random effects test equation:
Dependent Variable: ROA
Method: Panel Least Squares
Date: 10/16/18   Time: 15:41
Sample: 2009 2017
Periods included: 9
Cross-sections included: 4
Total panel (balanced) observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.436162	0.913837	5.948723	0.0000
CAR	-0.050257	0.027476	-1.829101	0.0777
NPL	-0.462646	0.095161	-4.861744	0.0000
LDR	-0.002320	0.010585	-0.219213	0.8280

Effects Specification			
Cross-section fixed (dummy variables)			

R-squared	0.895860	Mean dependent var	3.083333
Adjusted R-squared	0.874314	S.D. dependent var	1.073927
S.E. of regression	0.380731	Akaike info criterion	1.079216
Sum squared resid	4.203717	Schwarz criterion	1.387122
Log likelihood	-12.42589	Hannan-Quinn criter.	1.186684
F-statistic	41.57876	Durbin-Watson stat	1.452192
Prob(F-statistic)	0.000000		

5. Hausman *Tes*

Seeing from the probability value of F and Chi-square with the assumption:

a. a. If the probability value F and Chi-square $>\alpha = 5\%$, then the panel data regression test uses the Random Effect model.

b. b. If the probability value of F and Chi-square $<\alpha = 5\%$, then the panel data regression test uses the Fixed Effect model.

6. No LM test

LM test is only used to ensure which model will be used, the basis for this test is if the results of fixed and random tests are inconsistent. In the chow test, the suitable model is the fixed effect model, but when it is tested, the suitable model is the random model. So, to decide which model to use, then do the LM test.

7. Analysis of the Best Results

From the Chow test and Hausman test, the best model is the Fixed Effect model.

Dependent Variable: ROA
Method: Panel Least Squares
Date: 10/16/18   Time: 15:43
Sample: 2009 2017
Periods included: 9
Cross-sections included: 4
Total panel (balanced) observations: 36

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	5.436162	0.913837	5.948723	0.0000
CAR	-0.050257	0.027476	-1.829101	0.0777
NPL	-0.462646	0.095161	-4.861744	0.0000
LDR	-0.002320	0.010585	-0.219213	0.8280

Effects Specification

Cross-section fixed (dummy variables)

R-squared	0.895860	Mean dependent var	3.083333
Adjusted R-squared	0.874314	S.D. dependent var	1.073927
S.E. of regression	0.380731	Akaike info criterion	1.079216
Sum squared resid	4.203717	Schwarz criterion	1.387122
Log likelihood	-12.42589	Hannan-Quinn criter.	1.186684
F-statistic	41.57876	Durbin-Watson stat	1.452192
Prob(F-statistic)	0.000000		

8. F Test

The best model is FE with a regression equation
$Y = A + b X1 + c X2 + d X + e$

$Y = 5.436162 - 0.050257 X1 - 0.462646 X2 - 0.002320 X3$

a) The constant value can be interpreted that if there is no Capital Adequacy Ratio, Non Performing Loans, Loan to Deposite Ratio then the Return On Asset is 5,436.
b) $b = 0.050$ indicates that each reduction in Capital Adequacy Ratio by 1% will be followed by an additional Return on Assets of 0.050 with the assumption that other variables are fixed.
c) $c = 0.462$ indicates that each Non-Performing Loan reduction of 1% will be followed by the addition of 0.462 Return On Assets with the assumption that other variables are fixed.
d) $d = -0.002$ indicates that any reduction in Loan to Deposite Ratio of 1% will be followed by the addition of Return On Assets of -0.002 with the assumption that other variables are fixed.

9. t Test

Decision criteria of the following hypotheses:
1) If the significant level is greater than 5%, it can be concluded that H0 is accepted, and vice versa.
2) If the significant level is less than 5%, it can be concluded that H0 is rejected, otherwise Ha is accepted.
   a) There is no significant effect on the independent variable (CAR) toward the dependent variable (ROA).
   b) There is an effect on the independent variable (NPL) significantly toward the dependent variable (ROA).
   c) There is no significant effect on the independent variable (LDR) toward the dependent variable (ROA).

10. DISCUSSION

10.1 The Effect of CAR, NPL, And LDR on Roa of Soe Banks in Indonesia

From the results of testing the research variables simultaneously showed a significant relationship between the variables CAR, NPL and LDR on ROA. So that the fourth hypothesis can be stated which states that CAR, NPL and LDR simultaneously have a significant effect on ROA in state-owned banks in Indonesia, accepted.

It can be concluded, if the three variables are in a healthy level, it can be said that bank profits are proxied by ROA, so the child increases. Information regarding the health of the bank is expected to be used by the public or bank investors as an option in making decisions in investing funds or saving in banks.

10.2. Effect of CAR on ROA

From the results of testing the CAR variable produced that the CAR variable shows negative and insignificant results on ROA at state-owned banks in Indonesia. Thus the hypothesis which states that the CAR variable has a significant effect on ROA, is rejected.

From the test results, the regression coefficient which shows positive results means that the increased CAR value will tend to decrease ROA, and vice versa, if there is a decrease in CAR, it will increase ROA. This is due to the high CAR indicating that banks can use their capital well in generating profits.

Banks should manage and utilize their capital to be optimized so that it can generate good profits, but banks must continue to pay attention to the capital requirements held in operational activities in terms of financing to customers or in providing credit so that banks no longer need to reduce capital to pay for risks of losses that arise later.

10.3. Effect of NPL on ROA

From the test results on the NPL, variable produced that the NPL variable showed a negative result, but it was significant to ROA in BUMN banks in Indonesia. Thus, the hypothesis which states that the NPL variable has a significant effect on ROA, is accepted.

The results of the regression coefficient which shows a negative result means that if the value of NPL increases tends to result in a decrease of ROA. The results of this study are in line with the existing theories, which state that NPL have a negative effect on ROA, namely, the higher of NPL value, the profit received by banks will decrease, and vice versa. if NPL decreases, ROA will increase. NPL reflects a credit risk, namely, the smaller the NPL, the smaller the risk assumed by the bank for disbursed loans.

10.4. Effect of LDR on ROA

From the test results on the LDR variable, it is produced that the LDR variable shows negative and insignificant results on ROA of Soe Banks in Indonesia. Thus, the hypothesis which states that the LDR variable has a significant effect on ROA, is rejected.

From the results of the regression coefficient shows a negative result which means that the increased LDR value will tend to reduce ROA, because the higher LDR can be interpreted that banks cannot fulfill their obligations in providing loans. A high LDR, in this case, does not exceed a predetermined limit, it will increase profits derived from interest income.

LDR shows how far the bank's ability to repay withdrawals of funds by depositors by relying on loans provided as a source of liquidity. The additional credit provided by banks will have the potential to provide a higher rate of return on interest. Considering the source of bank revenue comes from the difference between loan interest and deposit interest. However, excessive lending will increase the risk exposure faced by banks. Therefore, banks also need to be selective in lending because besides providing credit in the form of interest income, improper lending can also trigger problem loans.

E. Conclusion and Suggestion

1. **Conclusion**
   a) CAR variable has no significant effect on ROA of state-owned banks in Indonesia.
   b) The NPL variable has a significant effect on ROA of state-owned banks in Indonesia.
   c) LDR variable has no significant effect on ROA of state-owned banks in Indonesia.
   d) Variable CAR, NPL and LDR jointly (simultaneously) significantly influence ROA of Soe Banks in Indonesia.

2. **Suggestion**
   a) a) CAR, NPL, and LDR have a significant effect on ROA, the bank should keep the LDR level in accordance with the requirements set by Bank Indonesia, keep the NPL level as low as possible by increasing the total loan by taking into account the customer's qualifications and using optimal capital, so CAR can increase.
   b) b) For further researchers, this study still has many limitations, including many internal factors that are not included as research independent variables and Time Series which are still too short, so it hopes that further research will be able to complete the limitations of this study.

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