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Analysis of Factors Affecting Banking Efficiency Levels at Commercial Banks in Indonesia

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ABSTRACT

One important aspect of an enterprise's success is the efficiency level. Efficiency is the relationship between managing the company's inputs and outputs optimally. This study aims to determine what factors affect banking efficiency at commercial banks in Indonesia. The method used is quantitative descriptive, where data is taken from data that has been published. The sample in this study was taken from one of the commercial banks in Indonesia, namely Bank Mandiri, in 2018-2022. The result of this study is that CAR and LDR together do not significantly affect the banking efficiency level in commercial banks in Indonesia, where CAR is positive, and LDR is negative.

INTRODUCTION

Banking is part of the financial system. Banks are suppliers of most of the money, so that monetary policy mechanisms can be used. This shows that the bank is a financial institution that is very important in carrying out economic activities. In assessing financial performance, the level of bank health has an important role in the actual condition of banking. When measuring efficiency, banks are faced with obtaining an optimal output level with a current input level or using a minimum input level with a certain level of output (Septiana Handayani Sagala, 2020).

The condition of financial institutions is very important because it will be used by related parties such as the general public, investors, and Bank Indonesia as a bank supervisor in Indonesia. Looking at the existing conditions, the performance measures of a bank can be seen how the ability of banks to produce maximum output with certain inputs. By looking at the good performance measures of the bank, it can also be seen the efficiency achieved by the bank. The assessment of the bank's health is very important because the bank manages public funds.

Research (Taswan & Si, 2010) states that banking efficiency contains two dimensions: the availability of various financial instruments for profitable asset owners, providing the most optimal portfolio for the benefit of return, risk, and liquidity (Permana & Adityawarman, 2015).

In assessing the company's condition, banks are no exception; they can use financial statement analysis to get interpretations about the company. When efficiency measurement takes place, a company will face conditions where the optimal output level with a certain input level can be analyzed to see how efficient a company is. Seeing these conditions, banks need to improve their operational efficiency in order to be able to deal with changes that may occur. Factors affecting banking efficiency can be measured using bank size, capital adequacy ratio, LoA to deposit ratio, non-performing loans, and capitalization (Istinfarani & Azmi, 2020).

Research on factors that affect banking efficiency has indeed been carried out, including those carried out by(ANTONI, 2016), who stated that the profitability of ROA and the size of the company positively influence the efficiency of Islamic banks. It is also supported by research by (Liviawati, Aljufri, & Wardi, n.d.) The inclusion of LDR and CAR also affects the efficiency of the bank. However, this is different from research conducted by (Sofiana, Wahyuarini, & Noviena, 2020), which states that CAR negatively affects bank efficiency.

The Capital Adequacy Ratio (CAR) shows the capital at risk of total assets owned by a bank. The relationship between CAR and banking efficiency tends to have large capital and the ability to generate large profits. This can be supported by the theory of Moral Hazard, which states that company managers closer to bankruptcy will tend to pursue their desires (Haryana et al., 2014). Research (Liviawati et al., n.d.) states that CAR affects the efficiency of state banks. However, this differs from research conducted by (Sofiana et al., 2020). CAR has a negative influence on the level of efficiency of banks. This result indicates that banks with a high CAR will reduce bank efficiency.

Loan Deposit Ratio (LDR) is a ratio used as a benchmark for bank performance in lending. LDR is the ratio of credit to total third-party funds to measure third-party funds in the form of credit. The greater the credit, the greater the risk that must be borne by the bank concerned (Liviawati et al., n.d.). Research conducted by (Liviawati et al., n.d.) states that LDR affects the efficiency of state banks. This also aligns with research (Sofiana et al., 2020), which states that the Loan Deposit Ratio significantly influences bank efficiency. That is, banks with a high LDR will increase the value of bank efficiency. Conversely, a low LDR will reduce the efficiency level of the bank (Istinfarani & Azmi, 2020).

The efficiency measurement in this study uses the ratio of financial expenses, namely operating expenses, to operating income (BOPO). BOPO is a ratio used to measure the efficiency level of bank management in controlling operational costs to operating income. The smaller the value of BOPO, the more efficient the bank is in carrying out its activities because its operational costs are smaller than its operating income (Amalia & Diana, 2022).

From the description above, the level of banking efficiency is important and must be maintained so that a bank can operate more competitively. This study aims to analyze CAR and LDR's effect on banking efficiency using the BOPO ratio.

METHOD

In this study, the population is general or conventional banking in Indonesia. The sample of this study is one general bank, namely bank mandiri. The authors took a sample of research from 2018-2022. This study uses secondary time series data in the form of data taken from financial statements and data published using the sampled companies' quarterly data. The source of data used is data obtained through internet media searches www.ojk.go.id website.

Data analysis techniques use classical assumption tests consisting of normality, multicollinearity, heteroskedasticity, and autocorrelation tests. Then perform multiple linear regression analysis using the OLS model and perform individual parameter significant tests (T statistical test), determination coefficient test (R2 test), and significant simultaneous test (F statistical test). The equations used in this study are:

$$\mathbf{Y = a + bx_1 + bx_2 + e}$$

Information:
Y = Variabel depend (BOPO)
a = Constant
b = Variable independent
X1 = CAR
X2 = LDR
e = Error

RESULTS AND DISCUSSION

1. Normality Test

The normality test aims to determine whether the data in the study has a normal distribution (Amalia &; Diana, 2022). The results of normality testing are obtained in the figure below:

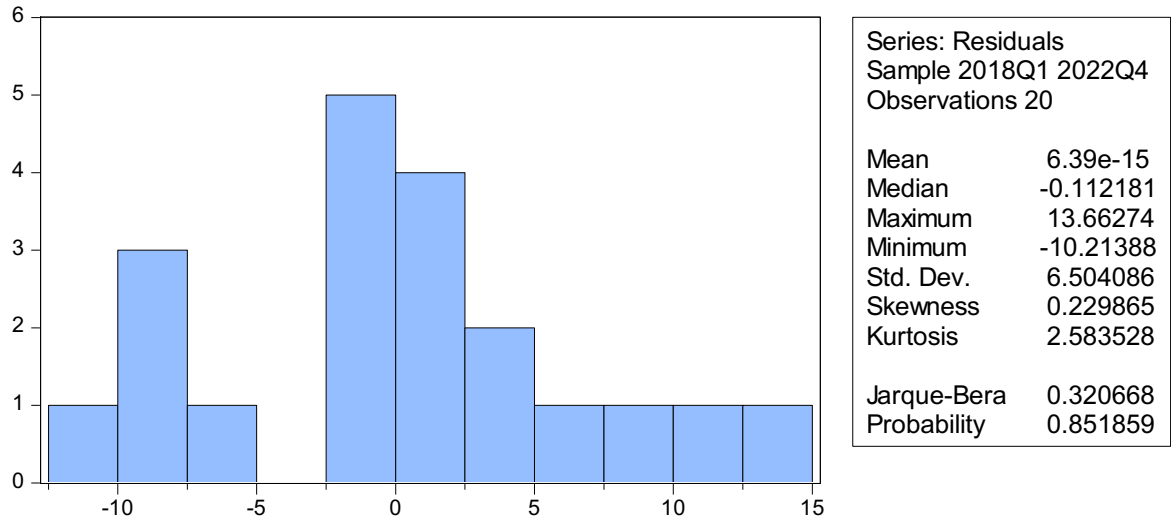

Figure 1. Normality Test Results
Source: Data processed by researchers using Eviews 9

The normality test results in Table 1 obtained a probability number of 0.851859. This value is greater than the level of significance (α = 0.05), namely (0.85 > 0.05). Then it can be concluded that the data are normally distributed, and the regression model has fulfilled the normality assumption.

2. Multicollinearity Test

This multicollinearity test is carried out to ascertain whether, in a regression model, there is intercorrelation or multicollinearity in the independent variable. Multicollinearity assesses whether there is a correlation between independent variables in a regression model. Multicollinearity can be seen using the tolerance value or Variance Inflation Factor (VIF). If the tolerance value > 0.1 and VIF < 10, it is said that there is no multicollinearity problem, and if the tolerance value < 0.1 and VIF > 10, it is said that there is a multicollinearity problem between independent variables in the regression model (Dinda Fricillia Veralda, 2022). The results of the multicollinearity test are obtained in the table below:

Table 2. Multicollinearity Test Results

Variance Inflation Factors
Date: 05/12/23 Time: 22:09
Sample: 2018Q1 2022Q4
Included observations: 20

Variable	Coefficient Variance	Uncentered VIF	Centered VIF
C	649.8889	274.9109	NA
CAR	1.465667	248.7546	1.116155
LDR	0.047578	152.1755	1.116155

Source: Data processed by researchers using Eviews 9

Based on the results of the multicollinearity test, Table 2 shows the VIF value for each variable > 10. The CAR variable has a VIF value of 1.116155 > 10, and the LDR variable has a VIF value of 1.116155 > 10. Both variables show VIF > 10, so there is no multicollinearity problem between independent variables in the regression model.

3. Heteroskedasticity Test

The heteroskedasticity test is used to determine whether, in the regression model, there is an inequality of variance from the residual of one observation to another. The test results can be seen in the table below:

Table 3. Heteroskedasticity Test Results

Heteroskedasticity Test: White

F-statistic	1.638210	Prob. F(5,14)	0.2142
Obs*R-squared	7.382302	Prob. Chi-Square(5)	0.1937
Scaled explained SS	4.223042	Prob. Chi-Square(5)	0.5178

Test Equation:
Dependent Variable: RESID^2
Method: Least Squares
Date: 05/12/23 Time: 22:10
Sample: 2018Q1 2022Q4
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	-3500.645	5303.566	-0.660055	0.5199
CAR^2	-2.410551	6.150791	-0.391909	0.7010
CAR*LDR	-0.251506	1.996208	-0.125992	0.9015
CAR	119.0377	303.3775	0.392375	0.7007
LDR^2	-0.325974	0.207472	-1.571169	0.1385
LDR	58.05926	68.63532	0.845909	0.4118

R-squared	0.369115	Mean dependent var	40.18798
Adjusted R-squared	0.143799	S.D. dependent var	51.88564
S.E. of regression	48.01037	Akaike info criterion	10.82404
Sum squared resid	32269.94	Schwarz criterion	11.12276
Log-likelihood	-102.2404	Hannan-Quinn criteria.	10.88235
F-statistic	1.638210	Durbin-Watson stat	2.965951
Prob(F-statistic)	0.214227		

Source: Data processed by researchers using Eviews 9

Based on the results of the heteroskedasticity test using the white method, it can be concluded that Prob. Chi-Square of 0.1937. Where 0.1937 > 0.05, then it is said that there is no heteroskedasticity problem.

4. Autocorrelation Test

The autocorrelation test is used to determine whether there is a correlation between the current and previous residues (Dinda Fricillia Veralda, 2022). In this study, the autocorrelation test used the L.M. Serial Correlation Test. The test results can be seen in the table below:

Table 4. Autocorrelation Test Results

Breusch-Godfrey Serial Correlation LM Test:

F-statistic	3.049519	Prob. F(2,15)	0.0774
Obs*R-squared	5.781343	Prob. Chi-Square(2)	0.0555

Test Equation:
Dependent Variable: RESID
Method: Least Squares
Date: 05/12/23 Time: 22:12
Sample: 2018Q1 2022Q4
Included observations: 20
Presample missing value lagged residuals set to zero.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	35.44604	27.85283	1.272619	0.2225
CAR	-0.885955	1.193698	-0.742193	0.4694
LDR	-0.200775	0.212002	-0.947045	0.3586
RESID(-1)	-0.215880	0.252905	-0.853604	0.4067
RESID(-2)	-0.651249	0.265847	-2.449715	0.0271

R-squared	0.289067	Mean dependent var	6.39E-15
Adjusted R-squared	0.099485	S.D. dependent var	6.504086
S.E. of regression	6.172083	Akaike info criterion	6.690268
Sum squared resid	571.4191	Schwarz criterion	6.939201
Log-likelihood	-61.90268	Hannan-Quinn criteria.	6.738862
F-statistic	1.524760	Durbin-Watson stat	2.304120

Prob(F-statistic)	0.245189

Source: Data processed by researchers using Eviews 9

Prob results are obtained based on the autocorrelation test output in Table 4. Chi-Square of 0.0555, where this value is greater than 0.05. Thus, it is concluded that the research data does not occur autocorrelation problems.

5. Multiple Linear Regression Analysis

Multiple linear regression equations are used to determine the effect of the independent variable on the dependent variable and how much influence it is. The results of data processing can be seen in the table below:

Table 5. Multiple Linear Regression Test Results

Dependent Variable: BOPO
Method: Least Squares
Date: 05/12/23 Time: 22:05
Sample: 2018Q1 2022Q4
Included observations: 20

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	50.17139	25.49292	1.968052	0.0656
CAR	0.957660	1.210647	0.791032	0.4398
LDR	-0.034498	0.218123	-0.158156	0.8762

R-squared	0.036076	Mean dependent var	66.32200
Adjusted R-squared	-0.077327	S.D. dependent var	6.624678
S.E. of regression	6.876044	Akaike info criterion	6.831445
Sum squared resid	803.7596	Schwarz criterion	6.980805
Log-likelihood	-65.31445	Hannan-Quinn criteria.	6.860602
F-statistic	0.318119	Durbin-Watson stat	2.022971
Prob(F-statistic)	0.731754		

Source: Data processed by researchers using Eviews 9

Based on the output results of Table 5, the multiple regression analysis equations are obtained as follows:

$$\mathbf{Y = 50{,}17139 + 0{,}957660 - 0{,}034498 + e}$$

The constant value of 50.17139 can be interpreted if CAR (X1) and LDR (X2) are 0, then the efficiency of the bank (Y) is 50.17139. The CAR variable regression coefficient (X1) value of 0.957660 means that if it increases by 1%, the level of banking efficiency increases by 0.957660%. This indicates that the coefficient for this variable is positive. So the higher the CAR value, the higher the level of banking efficiency. Meanwhile, the value of the regression coefficient of the LDR variable (X2) is -0.034498, meaning that if it increases by 1%, the level of banking efficiency decreases by 0.034498%. This indicates that the coefficient of this variable is negative.

Based on the results of the T-Test, the value of the regression coefficient of the CAR variable (X1) is 0.957660, and the probability is 0.4398 with a level of $\alpha = 0.05$. This shows that the effect of CAR on BOPO is positive and insignificant. Moreover, the value of the regression coefficient of the LDR variable (X2) is -0.034498, and the probability is 0.8762. This shows that the effect of LDR on BOPO is negative and insignificant.

Based on the results of the R2 Test using the OLS model, an R-squared or coefficient of determination of 0.036076 is obtained, which means that the dependent variable or Y can explain the relationship or variation of independent variables, namely X1 and X2 by 3.6%. The remaining 96.4% was explained by factors other than the model.

Based on the results of the F Test or simultaneous test shows an F-statistic probability value of 0.731754, where the value is > 0.05, it is said that together the variables CAR (X1) and LDR (X2) do not have a significant effect, and are not simultaneous on the variable BOPO (Y).

Discussion

Based on the results of the T-test in Table 5 above, two variables affect banking efficiency: CAR and LDR, where CAR is positive, and LDR is negative. Meanwhile, from the results of the F test, these two variables together do not have a significant and non-simultaneous effect on the level of bank efficiency.

The effect of the Capital Adequacy Ratio (CAR) on operating expenses to operating income (BOPO) shows a positive but insignificant influence. This means that the greater value of the CAR does not necessarily indicate a high level of banking efficiency. Based on the decision made by Bank Indonesia, the minimum capital provision is 8%. So the greater the CAR ratio, the safer the funds obtained from depositors in a bank. These results are supported by research conducted by (Sofiana et al., 2020) concluded that CAR has a positive effect on the level of efficiency of banking performance (Istinfarani & Azmi, 2020).

The effect of the Loan Deposit Ratio (LDR) on operating expenses on operating income (BOPO) shows that there is a negative and insignificant influence. This means that if the LDR value gets smaller, only sometimes the level of banking efficiency is also low, or vice versa. The LDR indicator is a comparison between total loans to third-party funds. If this ratio exceeds 100%, it can be said to be bad because the bank issues all deposits received from third parties, which are then distributed to customers. This result is inversely proportional to research conducted by Liviawati (2019) concluded that LDR has a positive influence on the efficiency of state banks (Abror, Wardi, Trinanda, & Patricia, 2019) (Arman, Wardi, & Evanita, 2019).

CONCLUSION

In this study, two variables affect the level of banking efficiency at commercial banks in Indonesia, where the two variables are CAR and LDR. (1) CAR has a positive influence on the level of banking efficiency at commercial banks in Indonesia, while LDR has a negative influence on the level of banking efficiency at commercial banks in Indonesia. (2) CAR and LDR have no significant and non-simultaneous effect on banking efficiency at commercial banks in Indonesia, where the effect was 3.6%. In comparison, the remaining 96.4% was explained by other factors outside the model that were not studied in this study.

For banks, based on this study that uses CAR and LDR variables, the researcher recommends paying attention to and maintaining these financial ratios and others following Bank Indonesia regulations.

For researchers, if they want to do the same research, it is expected that further researchers multiply variables using other financial ratios that have not been or rarely studied by previous researchers and can also use macro variables, such as economic growth, etc. so that the results of the research are more accurate and efficient.

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