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Financial Performance And Its Implications On The Profitability Of Banks Listed On The Indonesia Stock Exchange (IDX) 2018 - 2022

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Abstract

This research objective is to analyze and examine the influence of capital adequacy ratio (CAR), non-performing loan (NPL), operational expenses to operational income ratio (BOPO), and loan to deposit ratio (LDR) on return on assets (ROA) in banking sector companies listed in the Indonesia Stock Exchange (Jakarta Stock Exchange). The data used are the financial ratios of banks from 2018 to 2022. The sample size for this study consists of 10 companies selected using purposive sampling method. The data analysis technique used is panel data regression analysis, processed using Eviews 9.0 application following the random effect model. The results of this research indicate that CAR and LDR have no effect on return on assets (ROA), while NPL and BOPO have negative effect on return on assets (ROA).

Keywords: *ROA, CAR, NPL, LDR*

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1. Introduction

Rahmat & Ruchiyat (2021) state that one of the challenges frequently faced by banks is declining profitability, which can lead to a decline in financial performance and bank performance in the following period. A decline in bank performance, indicated by the inability to generate profits (profitability), can affect public loyalty, as many assume that banks with low profitability will perform poorly in financial management. Dietrich & Wanzenried (2011) indicate that a decline in banking quality can occur due to a decline in financial performance caused by providing credit to customers without adequate capital participation or collateral to offset potential risks. From an authority perspective, Pandia (2018) adds that the Financial Services Authority (Otoritas Jasa Keuangan, OJK) uses profitability information to assess bank health, assist in establishing supervisory strategies, and focus supervision on banks. Shamsuddoha & Alamgir (2014) state that a bank's health can be seen from financial reports standardized by Bank Indonesia. In managing profitability, banking companies are required to be more dynamic in various aspects, including improving service capabilities to gain public trust.

Profitability ratios are used to assess a company's ability to generate profits (Lukito & Sandra, 2021). Return on assets (ROA) is one financial ratio that can be used as a measure of profitability. Return on assets (ROA) measures a company's effectiveness in generating profits by utilizing its assets by comparing profit before tax to total assets. An increase in return on assets (ROA) ultimately benefits shareholders (Purwanto, 2018).

Many factors influence a bank's performance, health, or profitability. As is known, financial conditions used as benchmarks for bank health include aspects of capital, assets, management, earnings, and liquidity (CAMEL). Capital is indicated by the capital adequacy ratio (CAR), assets quality proxied by non-performing loans (NPL), management can approached by using operating expenses to operating income (BOPO) ratio, earnings measured by return on assets (ROA), and liquidity performed by the loan-to-deposit ratio (LDR).

The bank profitability in Indonesia in the period of 2017 - 2021 can be seen in Graph 1, which shows the average ROA of banks listed on the IDX.

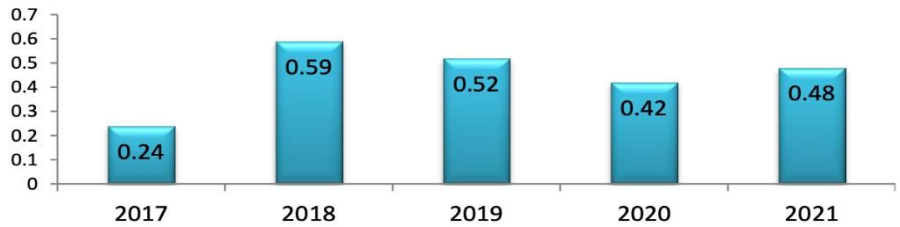

Figure 1. Average Return on Assets (ROA) of Banks Listed on the Indonesia Stock Exchange 2017-2021

According to Graph 1.1, the return on assets indicator for banks listed on the Indonesia Stock Exchange from 2017 to 2021 tended to fluctuate. In 2017, ROA

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reached 0.24%, while its highest level occurred in 2018 at 0.59%. However, from 2018 to 2021, there was a decrease of 0.11%. In response to these ROA fluctuations, an in-depth analysis of factors that can influence profitability is necessary. Several indicators selected in this study involve capital (capital adequacy ratio or CAR), non-performing loans (NPL), the ratio of operating expenses to operating income (BOPO), and liquidity (loan to deposit ratio or LDR).

The determination of the capital adequacy ratio (CAR) as a variable influencing profitability is based on its relationship to the bank's risk level. A high capital ratio can protect customers, thereby increasing customer trust in the bank (Africa, 2019). Research on the effect of changes in the capital adequacy ratio (CAR) on return on assets (ROA) has yielded various results. Research by Mainata & Ardiani (2018) and Abdurrohman et al. (2020) indicated that the capital adequacy ratio (CAR) has a positive effect on return on assets (ROA), but Noviarvanty & Aminah (2022) and Latifah et al. (2022) found that the capital adequacy ratio (CAR) had no effect on return on assets (ROA). Non-performing loans (NPLs) indicate a bank's ability to recover loans issued until they are repaid. Non-performing loans (NPL) are the percentage of non-performing loans (categorized as substandard, doubtful, and loss) to the total loans issued by a bank (Sorongan, 2020). A high level of non-performing loans (NPL) will increase costs, including the cost of providing reserves for productive assets and other costs. In other words, the higher a bank's non-performing loan (NPL), the more it will disrupt its performance. Research conducted by Khamisah et al. (2020) and Latifah et al. (2022) showed that non-performing loans (NPL) negatively impact return on assets (ROA). However, research by Darmawan et al. (2020) showed that non-performing loans (NPL) positively impact return on assets (ROA).

The operating expense to operating income (BOPO) ratio is measured quantitatively and indicates efficiency. This ratio assesses whether bank management has utilized all its production factors effectively and efficiently. Bank business efficiency is measured using the ratio of operating expenses to operating income (BOPO) (Ferdiansyah & Widyarti, 2022). Research conducted by Asnawi & Rate (2018) indicates that BOPO has a positive effect on return on assets (ROA). However, research by Khamisah et al. (2020), Azizah & Manda (2021), and Lemiyana & Erdah (2019) shows a negative effect on return on assets (ROA). One measure of bank liquidity is the loan-to-deposit ratio (LDR), which measures the amount of bank funds allocated to loans. Bank Indonesia's loan-to-deposit ratio (LDR) regulations stipulate that this ratio should range between 80% and 110% (Moorcy, 2020). The higher the loan-to-deposit ratio (LDR), the higher the bank's profit, assuming the bank is able to distribute its loans effectively and avoid non-performing loans. Therefore, the size of a bank's loan-to-deposit ratio (LDR) will affect its performance. Research conducted by Abdurrohman et al. (2020), Ali & Triyuliawan (2017), Indrayani et al. (2018), and Latifah et al. (2022) shows that the loan-to-deposit ratio (LDR) has a positive effect on return on assets (ROA), while research conducted by Setyaningsih et al. (2023) and

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Maulana et al. (2021) shows that the loan-to-deposit ratio (LDR) has no effect on return on assets (ROA).

2. Literature Review

According to Rahmat & Ruchiyat (2021), one of the challenges frequently faced by banks is declining profitability, which can lead to a decline in financial performance and bank performance in the following period. A decline in bank performance, indicated by the inability to generate profits (profitability), can affect public loyalty, as many assume that banks with low profitability will perform poorly in financial management. Dietrich & Wanzenried (2011) indicate that a decline in banking quality can occur due to a decline in financial performance caused by providing credit to customers without adequate capital participation or collateral to offset potential risks. From an authority perspective, Pandia (2018) adds that the Financial Services Authority (Otoritas Jasa Keuangan, OJK) uses profitability information to assess bank health, assist in establishing supervisory strategies, and focus supervision on banks. Shamsuddoha & Alamgir (2014) state that a bank's health can be seen from financial reports standardized by Bank Indonesia. In managing profitability, banking companies are required to be more dynamic in various aspects, including improving service capabilities to gain public trust. Profitability ratios are used to assess a company's ability to generate profits (Lukito & Sandra, 2021). Return on assets (ROA) is one financial ratio that can be used as a measure of profitability. Return on assets (ROA) measures a company's effectiveness in generating profits by utilizing its assets by comparing profit before tax to total assets. An increase in return on assets (ROA) ultimately benefits shareholders (Purwanto, 2018).

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Based on the theoretical review and previous research results, this research model can be constructed as shown in Figure 2.4.

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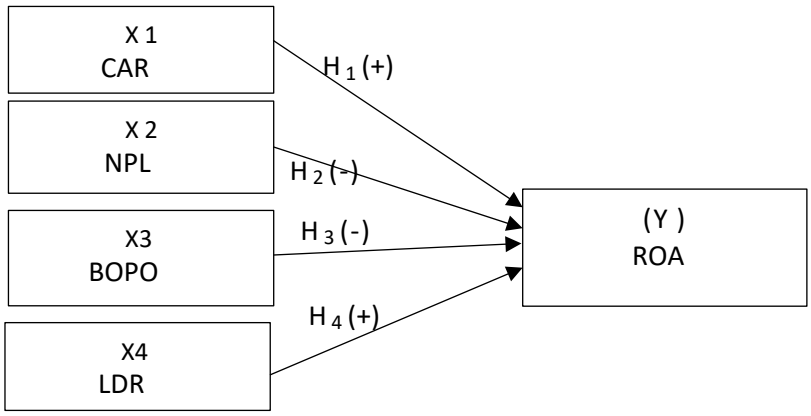

Figure 1. Research Model

Related to research model, the hypothesis are,
Hypothesis 1: Capital adequacy ratio (CAR) has a positive effect on return on assets (ROA).
Hypothesis 2: Non-performing loans (NPL) have a negative effect on return on assets (ROA).
Hypothesis 3: Operating expenses to operating income (BOPO) have a negative effect on return on assets (ROA).
Hypothesis 4: Loan to deposit ratio (LDR) has a positive effect on return on assets (ROA).

3. Research Methods

This research was conducted using a quantitative and causal approach, analyzing the causal relationship between the independent variables (X) and the dependent variable (Y). The independent variables include the capital adequacy ratio (CAR), non-performing loans (NPL), operating expenses to operating income (BOPO), and the loan-to-deposit ratio (LDR), while the dependent variable is return on assets (ROA).

The population used in this study was conventional banks, including BUKU 3 banks listed on the Indonesia Stock Exchange (IDX) during the study period of 2018–2022. Sampling was conducted using a purposive sampling method, namely BUKU 3 banks that met several established criteria. The criteria for banks used as research samples were as follows:

1. Conventional banking companies listed on the Indonesia Stock Exchange (IDX) during the study period (2018–2022).
2. Available financial report data for the study period (2018–2022).
3. The banks studied were conventional banks classified as BUKU 3 banks operating during the study period (2018-2022).

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BUKU 3 banks are banks with core capital between 5 trillion and 30 trillion rupiah. Since 2017, no banks have left the BUKU 3 category. Based on these criteria, 10 banks were sampled: Bank Pembangunan Daerah Jawa Barat dan Banten (BJBR), Bank Mega (MEGA), Bank Pembangunan Daerah Jawa Timur (BJTM), Bank CIMB Niaga (BNGA), Bank Danamon Indonesia (BDMN), Bank HSBC Indonesia (HSBC), Bank Tabungan Pensiunan Negara (BTPN), Bank Maybank Indonesia (BBII), Bank Permata (BNLI), and Bank OCBC NISP (NISP). With a sample of 10 banks and a 5-year observation period, the total number of observations was 50.

The data was secondary and collected using the documentation method, namely by directly quoting published financial reports in the Indonesian Banking Directory from Bank Indonesia listed on the IDX in the form of evidence, historical records or reports, company documents, and other reports compiled in archives for the period 2018-2022.

The analysis techniques used are descriptive statistics and panel data multiple regression. Descriptive statistics are used to present the research data profile, including the average value, highest and lowest values, and standard deviation. Panel data regression analysis is used to analyze the causal relationship between independent and dependent variables across multiple samples over time. In other words, panel data is a combination of time series and cross-sectional data. By accommodating information related to both cross-sectional and time series variables, panel data can substantially reduce the problem of omitted variables, a model that ignores relevant variables (Gujarati & Porter, 2013: 271). Some advantages of using a panel data approach are (Siregar, 2016: 78):

(1) heterogeneity
(2) greater information, variety degrees of freedom, and efficiency
(3) avoidance of multicollinearity problems
(4) superiority in studying dynamic changes such as unemployment, job turnover, and labor mobility
(5) better ability to detect and measure unobservable influences in pure cross-sections or pure time series
(6) Can be used to study behavioral models and
(7) minimize bias. According to Widarjono (2013), in panel data model analysis, there are three approaches used to estimate panel data regression models, namely:

1. Common Effects Model (pooled least squares).

   Pooled least squares is the simplest panel data regression model estimation method, assuming constant intercepts and regression coefficients (slopes) across time and cross-sections (common effect). This approach ignores the individual or time dimensions, so the data behavior between companies is assumed to be the same across time periods. Essentially, the common effects model is similar to OLS, minimizing the sum of squares, but the data used is not time series or cross-sectional data but panel data, applying pooled data.

   The regression model for the common effects model is:

   $Y_{it} = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + \beta_5 X5_{it} + e_{it}$

   e_{it}: error term

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2. Fixed Effects Model.

   This model assumes that differences between individuals can be accommodated by differences in their intercepts. To estimate a fixed effects model with different intercepts between individuals, a dummy variable technique is used. This model assumes that the regression coefficient (slope) is constant across firms and over time. One way to determine this difference is to assume that the intercept differs across firms, while the slope remains the same across firms. However, this method has a weakness, namely the reduction in degrees of freedom, which ultimately reduces the efficiency of the parameters. The fixed effects model equation is:

   $Y_{it} = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_4 X4_{it} + e_{it}$

   Where

   D_{1i} = 1 dummy for firm 1, 0 otherwise;

   D_{21} = 1 dummy for firm 2, 0 otherwise, and so on.

3. Random Effects Model

   A random effects model is a panel data regression model estimation method that assumes a constant regression coefficient (slope) and a different intercept across time and between individuals (random effect). The inclusion of dummy variables in the fixed effects model aims to represent uncertainty about the true model and also results in a reduction in degrees of freedom, which ultimately reduces parameter efficiency. This problem can be addressed by using error terms, which may arise in the relationship between time and between companies, known as random effects models. The estimation equation using a random effects model can be written as follows:

   $Yit = \beta_0 + \beta_1 X1_{it} + \beta_2 X2_{it} + \beta_3 X3_{it} + \beta_5 X5_{it} + \boldsymbol{\omega}_{it}$

   Where

   $\boldsymbol{\omega}_{it}$ = *Error term*

   $\boldsymbol{\omega}_{it} = eit + \mu it$

The selection of the best model among the available models is carried out using the Chow test, the Hausman test, and the Lagrange multiplier.

After selecting the best model, the next step is to test the classical assumptions and then estimate the regression equation using the selected model. The final stage of the analysis is the parameter significance test and the coefficient of determination analysis.

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4. Results

Descriptive Analysis

The results of the descriptive analysis can be seen in Table 1.

Table 1. Descriptive Analysis

	Y_ROA	X1_CAR	X2_NPL	X3_BOPO	X4_LDR
Mean	1,961200	23,56940	2,378400	79,26040	84,50160
Median	1,855000	23,58500	2,440000	80,42500	84,30000
Maximum	4,220000	34,90000	4,640000	93,40000	163,0000
Minimum	0,700000	17,31000	0,220000	56,06000	51,38000
Std. Dev.	0,800535	3,936364	1,040897	7,758754	20,55140
Skewness	0,860001	0,725619	0,206109	-0,853224	1,414642
Kurtosis	3,474582	3,728460	2,492894	4,112966	6,257536
Jarque-Bera	6,632572	5,493216	0,889750	8,647197	38,78414
Probability	0,036287	0,064145	0,640905	0,013252	0,000000
Sum	98,06000	1178,470	118,9200	3963,020	4225,080
Sum Sq. Dev.	31,40193	759,2533	53,08987	2949,715	20695,63
Observations	50	50	50	50	50

Source: Data processed with EVIEWS

The return on assets (ROA = Y) variable shows an average value of 1.96 percent with a standard deviation of 0.805, indicating that the average value is greater than the standard deviation. This indicates that the return on assets data exhibits little variation. The minimum value obtained is -0.7, representing BNLI's ROA in 2021, and the maximum value is 4.2, representing Bank Mega's ROA in 2021. The capital adequacy ratio (CAR = X1) variable has a mean value of 23.56 percent and a standard deviation of 3.94 percent. This means that the mean value is greater than the standard deviation, indicating that the capital adequacy ratio variable has low data variation. The minimum CAR value obtained is 17.31 which is the value of the BJBR company in 2020 and the maximum value is 34.9 which is the CAR value of the BNLI company in 2019. The non-performing loan variable (NPL = X2) has a mean value of 2.37 percent and a standard deviation of 1.04. This means that the mean value is greater than the standard deviation, which indicates that the NPL variable has small data variations. The minimum value (X2) obtained is 0.22 which is the NPL value of the BNII company in 2018 and the maximum value is 4.64 which is the NPL value of the HSBC company in 2021. The operating costs operating income variable (BOPO = X3) has a mean value of 79.26 and a standard deviation of 7.75. This means that the mean value is greater than the standard deviation, thus indicating that the variable has low data variations. The minimum value (X3) obtained is 56.06, which is the BOPO value of MEGA company in 2021, and the maximum value is 93.4, which is the BOPO value of BNLI company in 2018. The loan to deposit ratio (LDR = X4) variable has a mean value of 84.5 and a standard deviation of 20.55. This means that the

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mean value is greater than the standard deviation, thus indicating that the variable has low data variation. The minimum value (X4) obtained is 51.38, which is the LDR value of BJTM in 2020, and the maximum value is 163, which is the LDR value of BTPN company in 2019.

Selecting the Best Regression Model

In the Chow test, the cross-section probability F is 0.0042, which is less than 0.05. Therefore, it can be concluded that H0 is rejected and H1 is accepted. This means that the fixed effects model is more appropriate than the common effects model. The Hausman test shows that the random effects model is 0.3251, which is greater than 0.05. Therefore, it can be concluded that H0 is rejected and H1 is accepted. This means that the test will proceed with the random effects model. The Lagrange multiplier test yields a Breusch-Pagan probability of 0.0228, which is less than 0.05. Therefore, H0 is rejected and H1 is accepted. Therefore, it can be concluded that the Lagrange multiplier test determines that the random effects method is more appropriate than the common effects model. Therefore, the most appropriate model to use in this study is the random effects model.

Classical Assumption Test

The correlation coefficient between the independent variables is below 0.80, so it can be concluded that there is no multicollinearity. The normality test in this study used the Jarque-Bera test. After data transformation with log10, the results showed a probability value of 0.56564, which is greater than 0.05. Therefore, we conclude that the research data is normally distributed. Heteroscedasticity was tested using the Glejser test, which regresses the independent variables against the absolute value of the residuals. The criterion used is that if the significance value (prob) for all independent variables exceeds 0.05, it is concluded that there is no heteroscedasticity. The results showed that the significance value is greater than 0.05, thus concluding that there is no heteroscedasticity. The autocorrelation test showed a Durbin-Watson value of 2.1339, which is greater than dU (1.7214) and less than 4-dU (2.2786), thus concluding that there is no autocorrelation in the regression model.

Estimation and Interpretation of the Regression Equation

Regression models are used to determine the positive or negative direction of the influence of the independent variables on the dependent variable. The results obtained are listed in Table 2.

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Table 2. Regression Parameters and t-Test

Variable	Coefficient	Std. Error	t-Statistic	Prob
capital adequacy ratio (X1)	0.200889	0.222016	0.904840	0.3704
non-performing loan (X2)	-0.141683	0.066878	-2.118526	0.0397
operating costs operating income (X3)	-2.542138	0.375391	-6.771966	0.0000
loan to deposit ratio (X4)	0.131709	0.188236	0.699700	0.4877
C	4.598670	0.912780	5.038092	0.0000

Source: E-views data analysis output

Based on Table 2, the following regression equation can be obtained:
Y = 4.5986 + 0.20089 X1 – 0.14168 X2 – 2.5421 X3 + 0.01317 X4

1. The constant value of 4.5986 indicates that if the independent variables, namely the capital adequacy ratio, non-performing loans, operating expenses/operating income, and loan-to-deposit ratio, are zero, then the return on assets is 4.5986. The probability (Prob.) of this parameter is 0.0000, thus its effect is considered significant.
2. The capital adequacy ratio regression coefficient value of 0.20089 indicates that the capital adequacy ratio has a positive effect on return on assets. A one percent increase in the capital adequacy ratio will result in a 0.20089 percent increase in return on assets, assuming other variables remain constant. The probability (Prob.) of this variable is 0.3704, indicating that the CAR variable has no significant effect on ROA.
3. The coefficient value for non-performing loans is -0.141683, indicating that non-performing loans negatively impact return on assets. A one percent decrease in non-performing loans will result in a 0.141683 percent decrease in return on assets, assuming other variables remain constant. The probability (Prob.) of this variable is 0.0397, indicating that the NPL variable has a negative effect on ROA.
4. The coefficient value for operating expenses and operating income is -2.542138, indicating that operating expenses and operating income negatively impact return on assets. A one-unit increase in operating expenses and operating income will result in a 2.54218 percent decrease in return on assets, assuming other variables remain constant. The probability (Prob.) of this variable is 0.0000, indicating that the BOPO variable has a significant negative effect on ROA.
5. The loan-to-deposit ratio coefficient value of 0.1317 indicates that the loan-to-deposit ratio has a positive effect on return on assets. A one-digit increase in the loan-to-deposit ratio will result in a 0.1317 percent increase in return on

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assets, assuming other variables remain constant. The probability (Prob.) of this variable is 0.4877, concluding that the LDR variable does not have a significant effect on ROA.

The model fit test, or simultaneous test of the influence of independent variables on the dependent variable, is shown in Table 3.

Table 3. The Model Fit Test (F-Test)

R-squared	0.653153
Adjusted R-squared	0.622322
S.E. of regression	0.079770
F-statistic	21.18505
Prob(F-statistic)	0.000000

Source: E-views data analysis output

The data processing results in Table 3 show a significance value or Prob (F-statistic) of 0.00000, which is less than 0.05. Therefore, H0 is rejected and Ha is accepted. The model is fit, indicating that the capital adequacy ratio, non-performing loans, operating expenses, operating income, and loan-to-deposit ratio collectively have a significant effect on return on assets.

Analisis Koefisien Determinasi

Coefficient of Determination Analysis

Coefficient of determination analysis aims to assess the model's ability to explain variations in the dependent variable caused by variations in the independent variables. The higher the R-Square value, the better the model.

Table 4. Coefficient of Determination Analysis (R^2)

R-squared	0.653153
Adjusted R-squared	0.622322
S.E. of regression	0.079770
F-statistic	21.18505
Prob(F-statistic)	0.000000

Source: E-views data analysis output

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The Eviews output in Table 4 shows the R-square value of 0.653153. This indicates that the capital adequacy ratio, non-performing loans, operating expenses, operating income, and loan-to-deposit ratio contribute 65.31% to ROA variation, with the remaining 34.69% influenced by other variables outside the study.

Discussion

1. Effect of Capital Adequacy Ratio on Return on Assets. The results of this study indicate that the capital adequacy ratio has no effect on return on assets. This analysis aligns with the analysis conducted by Pertiwi & Susanto (2019), which stated that the capital adequacy ratio does not affect return on assets. Banks with high CAR may not always generate high ROA if their management and operations are inefficient in optimizing the profit potential of their assets. Furthermore, CAR is more influenced by external factors such as financial regulations and regulatory demands, while ROA is more related to internal factors such as operational management and investment policies.
2. The Effect of Non-Performing Loans on Return on Assets. This study found that non-performing loans negatively impact ROA. This analysis aligns with research conducted by Pertiwi & Susanto (2019). Non-performing loans do not generate the expected interest income. When loans are not repaid on time, banks lose the interest income they would have received from those loans. A decrease in interest income can reduce the total income generated by a bank's productive assets, thus affecting return on assets (ROA). Banks typically incur additional costs in collecting non-performing loans or managing non-performing assets. These costs, such as collection and administrative fees, can consume a significant portion of revenue and negatively impact return on assets (ROA).
3. The Effect of Operating Costs on Operating Income on Return on Assets. The analysis in this study revealed that operating costs negatively affect return on assets (ROA). Therefore, the higher a company's operating costs per operating income (BOPO), the lower its return on assets. This analysis aligns with research conducted by Maulana et al. (2021). High operating costs can lead to a decrease in a company's net profit. If operating costs exceed operating income, this can result in losses and lower net income. ROA is calculated as net income divided by total assets, so a decrease in net income can directly impact ROA. Furthermore, high operating costs per operating income can also indicate a lack of efficiency in managing a company's operations. Inefficient costs can harm a company's productivity and overall performance. Poor operational efficiency can hinder a company's ability to generate maximum profits from its assets, which in turn can lower ROA.

The Effect of the Loan-to-Deposit Ratio on Return on Assets. The study revealed that the loan-to-deposit ratio had no effect on return on assets. The results of this analysis align with research conducted by Maulana et al. (2021), which stated that the loan-to-deposit ratio has no effect on return on assets. The

loan-to-deposit ratio does not provide information about a bank's operational efficiency or its ability to manage credit risk. Operational efficiency and sound credit risk management can have a greater impact on ROA than the LDR itself. Efficient operating costs and sound credit risk management can help banks optimize returns from their assets.

5. Conclusion

The conclusions drawn from this study are as follows:

1. The capital adequacy ratio has no effect on return on assets in banking companies listed on the IDX for the 2018-2022 period.
2. Non-performing loans negatively impact return on assets in banking companies listed on the IDX for the 2018-2022 period.
3. Operating costs per operating income negatively impact return on assets in banking companies listed on the IDX for the 2018-2022 period.
4. The loan to deposit ratio does not affect the return on assets of banking companies listed on the IDX for the 2018-2022 period.

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