



## Determinants Of Capital Adequacy Ratio Empirical Study of Banks Listed On The Indonesian Stock Exchange For The Period 2017 – 2022

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### Article Info

#### Article history:

Received August 20, 2024

Revised August 25, 2024

Accepted September 30, 2024

#### Keywords:

Political Competition,  
Regional Expenditure,  
Government Size,  
Financial Statement Internet  
Publication

### ABSTRAK

*This study aims to determine the effect of bank size, loan to deposit ratio, operating expenses on operating income, return on assets and non-performing loans on capital adequacy ratio. This research was conducted at commercial banks listed on the Indonesia Stock Exchange for the period 2017-2022. The population in this study were 46 commercial banks. The sampling technique used in this study was purposive sampling, thus the sample used was 39 samples. The data were analyzed using panel data regression. The results showed that bank size has a positive and significant effect on capital adequacy ratio, loan to deposit ratio has a negative and significant effect on capital adequacy ratio, operating expenses operating income has a positive and significant effect on capital adequacy ratio, return on assets has no effect on capital adequacy and non-performing loans have no effect on capital adequacy ratio.*

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## 1. INTRODUCTION

In economic development, banks play an active role as capital providers. This can be seen from the presence of banks in supporting the economy in building capital needs and when the lack of capital will be assisted by banks. For example, in building an industry such as a factory, the role of banks will be very important in encouraging the successful development of the industry. Financial statement analysis is one way that can be used to determine the condition of a company / bank including into a healthy condition, bankrupt or failed. The types of financial ratios that are often used are liquidity, solvency, profitability, profitability and market ratios. In Law No. 10 of 1998 concerning banking, where Bank Indonesia sets provisions on bank health by taking into account five aspects known as CAMEL (Capital, Asset, Management, Earnings, and Liquidity).<sup>4</sup> In addition, there is an additional assessment of sensitivity to market risk so that it becomes CAMELS.<sup>5</sup>

The banking industry and Central Bank policies around the world refer to the Basel Accord which is a benchmark for bank health and prudence. The Basel Accord is a banking regulation made by

the Basel Committee on Bank Supervision (BCBS) which is a cooperative international forum in supervising banking practices around the world in order to improve financial stability. BCBS requires banks operating internationally to meet the Minimum Capital Ratio (CAR) requirement of 8% (Capital Adequacy Ratio Comitte, 1999).

In POJK No.4/POJK.03/2016, it is stated that to assess a bank's health from a capital perspective, the Capital Adequacy Ratio (CAR) is used as the primary indicator. CAR represents the ratio between a bank's capital and its Risk-Weighted Assets (RWA). According to POJK No.11/POJK.03/2016 concerning the Minimum Capital Adequacy Requirements (KPMM) for Commercial Banks, banks must maintain a CAR of at least 8%.

Fatimah [9] argues that bank capital indicators should be prioritized to maintain public confidence in investing their funds in banks. The capital indicator is considered the lifeblood for banks in carrying out their function as intermediary institutions [1]. As profit-oriented financial institutions, banks rely on the capital aspect to achieve these goals and ensure business continuity. A bank's efforts to drive its operational activities are influenced by the size of its capital. Bank capital serves as a buffer to absorb both operational and other potential losses.

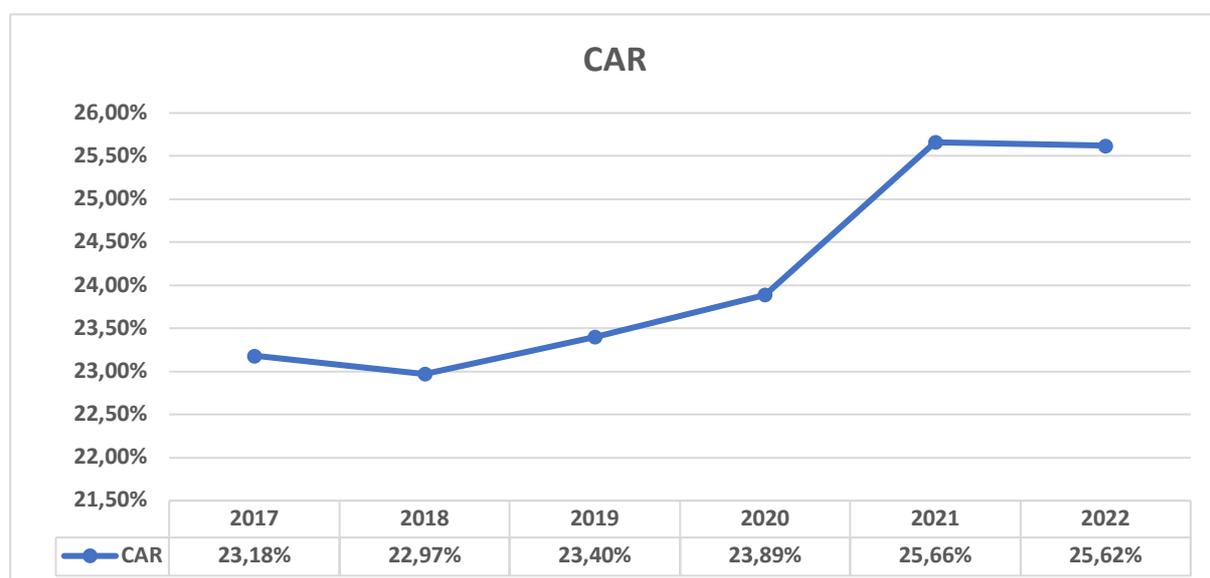


Figure 1. Development of Banking CAR in Indonesia for the Period 2017 -2022

From Graph 1, it is shown that between 2017 and 2022, the average banking CAR increased for four consecutive years. Starting in 2017 at 23.18%, it dropped slightly to 22.97% in 2018. However, from 2019 to 2022, it gradually increased again, reaching 25.62% by the end of 2022. Banks are considered capable of supporting business development and accommodating risks when CAR is at 8%. Therefore, it can be concluded that Indonesia's banking CAR has improved, indicating that the capital held by banks has also grown and is sufficient to cover any decline in assets.

Factors affecting CAR can be internal or external. Internal factors include banking operational activities reflected in financial performance. As a health indicator, financial performance is observed through the bank's financial ratios. External factors are related to monetary indicators, such as exchange rates and inflation. Additionally, fiscal policy is another external influence in banking. Examples of internal factors that impact CAR include Bank Size, Loan-to-Deposit Ratio (LDR), BOPO (Operational Costs to Operational Income), ROA (Return on Assets), and NPL (Non-Performing Loans).

Bank size is defined as a measure of the scale of a bank and can be expressed in terms of total assets, sales, and market capitalization. The greater the sales, assets, and market capitalization, the larger

the size of the company. Thus, bank size significantly impacts CAR, as a larger bank can more easily manage capital adequacy to be reinvested. This aligns with Dewi and Yadnya's research [2], which found that bank size has a significant effect on CAR. However, this contrasts with Charitou's research [3], which states that bank size has no effect on CAR.

The Loan to Deposit Ratio (LDR) is closely related to CAR. If the capital provided by the bank is effectively channeled through loans to borrowers (the broader community) in line with the bank's objectives, it can positively impact the bank's profitability. Conversely, if the LDR is not effectively channeled, it can severely impact the bank's income and capital turnover. This is supported by research conducted by Dewi and Dewi (2022), which indicates that LDR has a significant positive effect on CAR. However, research by Usman, Lestari, and Puspa [4] found that LDR has no effect on CAR.

BOPO (Operating Expenses to Operating Income) is a ratio that measures a bank's ability to control operating costs relative to its operating income. Losses can occur when a bank's operating expenses are too high, as these losses will be covered by capital. Therefore, improving operational efficiency can reduce capital adequacy requirements. A higher BOPO ratio indicates a less efficient bank in conducting its business activities [5]. This finding is supported by Putri's research (2017), which shows that BOPO has a significant positive effect on CAR. However, this is in contrast to Hamidah's research [6], which states that BOPO has no effect on CAR.

Profitability is an indicator of company performance, measuring whether a company has conducted its operational activities efficiently. Profitability is defined as the company's ability to generate profits from its capital. Therefore, the company's profit income greatly influences the capital adequacy that a bank can prepare. In this study, profitability is measured using ROA (Return on Assets). According to Estuti, Hendrayanti, and Fauziyanti (2020), ROA reflects the profit earned by shareholders and indicates improved company growth, as it shows an increase in company profits.

This aligns with the research of Setiawan and Muchtar [7], which states that ROA has a significant positive effect on CAR. However, this contrasts with Borkhari et al. (2019), who found that ROA has no effect on CAR.

Non-performing loans (NPL) represent the ratio between total non-performing loans and total loans extended to debtors. Banks with high NPL values can experience a decline in performance because a high non-performing loan value increases costs, including the cost of provisioning for productive assets and other expenses. Bank Indonesia Regulation No. 15/2/PBI/2013 stipulates that one criterion for banks considered at risk of operational difficulties that could jeopardize business continuity is a bank with a net NPL ratio of more than 5% of total loans.

This is supported by Margaretha's research (2018), which states that NPL has a negative and significant effect on CAR, though it contrasts with Pastory's research (2023), which found that NPL has a positive and significant effect on CAR.

## **2. METHOD**

### **2.1 Population and Sample**

The sample is a portion of the population, encompassing the number and characteristics possessed by the population. The sampling of companies in this study uses the purposive sampling method, which selects samples based on specific criteria to obtain a representative sample that meets the predetermined criteria. The sample criteria used in this study are as follows:

1. Commercial banks in Indonesia listed on the IDX for the 2017-2022 period, totaling 46 banks.
2. Companies that consistently publish financial reports for the period from December 31, 2017, to 2022 and submit them to the Financial Services Authority (OJK).
3. Companies that present complete financial reports and ratios required for this study for five consecutive years.

Table 1. 39 Company Samples

| No | Saham Code | Emitten Name                       | IPO Date   |
|----|------------|------------------------------------|------------|
| 1  | AGRO       | Bank Rakyat Indonesia Agroniag     | 08/08/2003 |
| 2  | AGRS       | Bank IBK Indonesia Tbk.            | 22/12/2014 |
| 3  | ARTO       | Bank Jago Indonesia Tbk.           | 12/01/2016 |
| 4  | BABP       | Bank MNC Internasional Tbk.        | 15/07/2002 |
| 5  | BACA       | Bank Capital Indonesia Tbk.        | 04/10/2007 |
| 6  | BBCA       | Bank Central Asia Tbk.             | 31/05/2000 |
| 7  | BBKP       | Bank Bukopin Tbk.                  | 10/07/2006 |
| 8  | BBMD       | Bank Mestika Dharma Tbk.           | 08/07/2013 |
| 9  | BBNI       | Bank Negara Indonesia (Persero)    | 25/11/1996 |
| 10 | BBRI       | Bank Rakyat Indonesia (Persero)    | 10/11/2003 |
| 11 | BBTN       | Bank Tabungan Negara (Persero)     | 17/12/2009 |
| 12 | BBYB       | Bank Neo Commerce Tbk.             | 13/01/2015 |
| 13 | BCIC       | Bank JTrust Indonesia Tbk.         | 25/06/1997 |
| 14 | BDMN       | Bank Danamon Indonesia Tbk.        | 06/12/1989 |
| 15 | BEKS       | Bank Pembangunan Daerah Banten     | 13/07/2001 |
| 16 | BGTG       | Bank Ganesha Tbk.                  | 12/05/2016 |
| 17 | BJBR       | Bank Pembangunan Daerah Jawa Barat | 08/07/2010 |
| 18 | BJTM       | Bank Pembangunan Daerah Jawa Timur | 12/07/2012 |
| 19 | BKSW       | Bank QNB Indonesia Tbk.            | 21/11/2002 |
| 20 | BMAS       | Bank Maspion Indonesia Tbk.        | 11/07/2013 |
| 21 | BMRI       | Bank Mandiri (Persero) Tbk.        | 14/07/2003 |
| 22 | BNBA       | Bank Bumi Arta Tbk.                | 01/06/2006 |
| 23 | BNGA       | Bank CIMB Niaga Tbk.               | 29/11/1989 |
| 24 | BNII       | Bank Maybank Indonesia Tbk.        | 21/11/1989 |
| 25 | BNLI       | Bank Permata Tbk.                  | 15/01/1990 |
| 26 | BSIM       | Bank Sinarmas Tbk.                 | 13/12/2010 |
| 27 | BSWD       | Bank Of India Indonesia Tbk.       | 01/05/2002 |
| 28 | BTPN       | Bank Tabungan Pensiunan Nasion     | 12/03/2008 |
| 29 | BVIC       | Bank Victoria International Tb     | 30/06/1999 |
| 30 | DNAR       | Bank Oke Indonesia Tbk.            | 11/07/2014 |
| 31 | INPC       | Bank Artha Graha Internasional     | 29/08/1990 |
| 32 | MAYA       | Bank Mayapada Internasional Tb     | 29/08/1997 |
| 33 | MCOR       | Bank China Construction Bank I     | 03/07/2007 |
| 34 | MEGA       | Bank Mega Tbk.                     | 17/04/2000 |
| 35 | NISP       | Bank OCBC NISP Tbk.                | 20/10/1994 |
| 36 | NOBU       | Bank Nationalnobu Tbk.             | 20/05/2013 |
| 37 | PNBN       | Bank Pan Indonesia Tbk             | 29/12/1982 |
| 38 | SDRA       | Bank Woori Saudara Indonesia 1     | 15/12/2006 |
| 39 | BINA       | Bank Ina Perdana Tbk.              | 16/01/2014 |

This research uses the panel data method. In this study, the analysis method applied is panel data regression analysis. For conducting this analysis and testing, the EViews12 software tool is used. The data analysis methods used in the study are as follows:

1. Descriptive Statistical Analysis
2. Panel Data Regression Tests (Common Effect, Fixed Effect, and Random Effect)
3. Selection of the Best Panel Data Regression Model through the Chow test, Hausman test, and Lagrange test
4. Hypothesis Testing, consisting of the F Test, R<sup>2</sup> Test, and T Test

### 3. RESULTS AND DISCUSSION

In this study, six variables are analyzed, consisting of five independent variables and one dependent variable. Data on these variables were collected from the Indonesia Stock Exchange in the form of financial and annual reports for the 2017-2022 period. The variables include Bank Size (X<sub>1</sub>), Loan to Deposit Ratio (X<sub>2</sub>), BOPO (X<sub>3</sub>), Return on Assets (X<sub>4</sub>), Non-Performing Loans (X<sub>5</sub>), and Capital Adequacy Ratio (Y) in banking sector companies listed on the Indonesia Stock Exchange (IDX) for the 2017-2022 period.

Table 2. Descriptive Statistics

|              | SIZE     | ROA       | NPL      | LDR      | CAR      | BOPO     |
|--------------|----------|-----------|----------|----------|----------|----------|
| Mean         | 31.56310 | 0.003427  | 0.033723 | 0.917572 | 0.279886 | 0.871322 |
| Median       | 31.23515 | 0.005763  | 0.025922 | 0.890363 | 0.224797 | 0.836526 |
| Maximum      | 35.22819 | 0.032508  | 0.277501 | 2.188910 | 1.699183 | 2.879175 |
| Minimum      | 27.22256 | -0.180577 | 0.000000 | 0.123606 | 0.090076 | 0.105884 |
| Std. Dev.    | 1.752309 | 0.022842  | 0.036555 | 0.324403 | 0.201726 | 0.346284 |
| Skewness     | 0.136152 | -3.732312 | 3.608155 | 0.938963 | 3.734084 | 2.558534 |
| Kurtosis     | 2.239186 | 24.05027  | 21.12616 | 5.225402 | 20.79108 | 14.07295 |
| Jarque-Bera  | 6.366627 | 4863.635  | 3711.171 | 82.67046 | 3629.885 | 1450.748 |
| Probability  | 0.041448 | 0.000000  | 0.000000 | 0.000000 | 0.000000 | 0.000000 |
| Sum          | 7385.764 | 0.801836  | 7.891175 | 214.7118 | 65.49322 | 203.8893 |
| Sum Sq. Dev. | 715.4471 | 0.121568  | 0.311352 | 24.52029 | 9.481527 | 27.93968 |
| Observations | 234      | 234       | 234      | 234      | 234      | 234      |

Tabel 3. Common Effect Model

Dependent Variable: CAR  
 Method: Panel Least Squares  
 Date: 02/12/24 Time: 18:51  
 Sample: 2017 2022  
 Periods included: 6  
 Cross-sections included: 39  
 Total panel (balanced) observations: 234

| Variable           | Coefficient | Std. Error         | t-Statistic | Prob.    |
|--------------------|-------------|--------------------|-------------|----------|
| C                  | 1.311610    | 0.266858           | 4.915019    | 0.0000   |
| SIZE               | -0.037477   | 0.007825           | -4.789233   | 0.0000   |
| LDR                | -0.040384   | 0.040486           | -0.997476   | 0.3196   |
| BOPO               | 0.203573    | 0.066982           | 3.039213    | 0.0026   |
| ROA                | 2.358862    | 1.027441           | 2.295860    | 0.0226   |
| NPL                | 0.081463    | 0.363867           | 0.223881    | 0.8231   |
| Root MSE           | 0.182809    | R-squared          |             | 0.175226 |
| Mean dependent var | 0.279886    | Adjusted R-squared |             | 0.157139 |
| S.D. dependent var | 0.201726    | S.E. of regression |             | 0.185199 |

|                      |           |                   |          |
|----------------------|-----------|-------------------|----------|
| Akaike infocriterion | -0.509462 | Sum squared resid | 7.820119 |
| Schwarz criterion    | -0.420864 | Log likelihood    | 65.60709 |
| Hannan-Quinn criter. | -0.473740 | F-statistic       | 9.687860 |
| Durbin-Watson stat   | 0.863117  | Prob(F-statistic) | 0.000000 |

Tabel 4. *Fixed Effect Model*

Dependent Variable: CAR

Method: Panel Least Squares

Date: 02/12/24 Time: 18:52

Sample: 2017 2022

Periods included: 6

Cross-sections included: 39

Total panel (balanced) observations: 234

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | -2.886221   | 0.791071   | -3.648500   | 0.0003 |
| SIZE     | 0.098383    | 0.024549   | 4.007538    | 0.0001 |
| LDR      | -0.147011   | 0.055403   | -2.653504   | 0.0086 |
| BOPO     | 0.202261    | 0.068990   | 2.931732    | 0.0038 |
| ROA      | 1.579244    | 0.969890   | 1.628272    | 0.1051 |
| NPL      | 0.417683    | 0.430681   | 0.969820    | 0.3334 |

Effects Specification

Cross-section fixed (dummy variables)

|                      |           |                    |          |
|----------------------|-----------|--------------------|----------|
| Root MSE             | 0.125257  | R-squared          | 0.612797 |
| Mean dependent var   | 0.279886  | Adjusted R-squared | 0.525167 |
| S.D. dependent var   | 0.201726  | S.E. of regression | 0.139005 |
| Akaike infocriterion | -0.940838 | Sum squared resid  | 3.671271 |
| Schwarz criterion    | -0.291119 | Log likelihood     | 154.0780 |
| Hannan-Quinn criter. | -0.678872 | F-statistic        | 6.993006 |
| Durbin-Watson stat   | 1.655627  | Prob(F-statistic)  | 0.000000 |

Source: E-Views 12.0 output (data has been processed, 2024)

Tabel 5. *Random Effect Model*

Dependent Variable: CAR

Method: Panel EGLS (Cross-section random effects)

Date: 02/12/24 Time: 18:54

Sample: 2017 2022

Periods included: 6

Cross-sections included: 39

Total panel (balanced) observations: 234

Swamy and Arora estimator of component variances

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | 0.620532    | 0.371394   | 1.670817    | 0.0961 |
| SIZE     | -0.013144   | 0.011220   | -1.171521   | 0.2426 |
| LDR      | -0.110314   | 0.045259   | -2.437402   | 0.0156 |

|                       |          |                    |          |          |
|-----------------------|----------|--------------------|----------|----------|
| BOPO                  | 0.193513 | 0.063348           | 3.054768 | 0.0025   |
| ROA                   | 1.598928 | 0.910223           | 1.756633 | 0.0803   |
| NPL                   | 0.040168 | 0.372039           | 0.107967 | 0.9141   |
| Effects Specification |          |                    |          |          |
|                       |          |                    | S.D.     | Rho      |
| Cross-section random  |          |                    | 0.113060 | 0.3981   |
| Idiosyncratic random  |          |                    | 0.139005 | 0.6019   |
| Weighted Statistics   |          |                    |          |          |
| Root MSE              | 0.145111 | R-squared          |          | 0.078962 |
| Mean dependent var    | 0.125555 | Adjusted R-squared |          | 0.058764 |
| S.D. dependent var    | 0.151528 | S.E. of regression |          | 0.147008 |
| Sum squared resid     | 4.927395 | F-statistic        |          | 3.909367 |
| Durbin-Watson stat    | 1.302605 | Prob(F-statistic)  |          | 0.002027 |
| Unweighted Statistics |          |                    |          |          |
| R-squared             | 0.129902 | Mean dependent var |          | 0.279886 |
| Sum squared resid     | 8.249860 | Durbin-Watson stat |          | 0.778007 |

Source: E-Views 12.0 output (data has been processed, 2024)

Table 6. Chow Test

Redundant Fixed Effects Tests

Equation: Untitled

Test cross-section fixed effects

| Effects Test             | Statistic  | d.f.     | Prob.  |
|--------------------------|------------|----------|--------|
| Cross-section F          | 5.650423   | (38,190) | 0.0000 |
| Cross-section Chi-square | 176.941836 | 38       | 0.0000 |

The Chow test is used to determine whether the selected model is the pooled least squares model or the fixed effects model.  $H_0H_0H_0$  is rejected if the F probability value is smaller than alpha (0.05), where  $H_0H_0H_0$  represents the pooled least squares model and  $H_1H_1H_1$  represents the fixed effects model.

The redundant fixed effect or likelihood ratio test for this model shows an F probability value of 0.0000, which is smaller than alpha (0.05). Therefore,  $H_0H_0H_0$  is rejected, and  $H_1H_1H_1$  is accepted, indicating that the appropriate model for this result is the fixed effects model.

Tabel 7. Hausman 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 | 32.008427         | 5            | 0.0000 |

Tabel 8. Multikolinearitas Test

Variance Inflation Factors  
 Date: 02/12/24 Time: 19:04  
 Sample: 1 234  
 Included observations: 234

| Variable | Coefficient<br>Variance | Uncentered<br>VIF | Centered<br>VIF |
|----------|-------------------------|-------------------|-----------------|
| C        | 0.071213                | 485.8434          | NA              |
| SIZE     | 6.12E-05                | 417.4604          | 1.277282        |
| LDR      | 0.001639                | 10.58699          | 1.171812        |
| BOPO     | 0.004487                | 26.89355          | 3.654783        |
| ROA      | 1.055636                | 3.826152          | 3.741587        |
| NPL      | 0.132399                | 2.229112          | 1.201869        |

Based on table 4.7, the VIF value of the SIZE variable is 1.277282, LDR is 1.171812, BOPO is 3.654783, ROA is 3.741587 and NPL is 1.201869. The five independent variables show that the VIF value is <10, which means that there is no multicollinearity in the model above.

Table 9. Conclusion of Panel Data Regression Model Selection

| Variabel     | Hasil Perhitungan                          | Conclusion |
|--------------|--|------------|
| Uji Chow     | (Prob) untuk cross section F 0.0000 < 0.05 | FEM        |
| Uji Hausman  | (Prob) untuk cross section F 0.0000 < 0.05 | FEM        |
| Uji Lagrange |  |            |

Table 10. Selected Fixed Effect Model

Dependent Variable: CAR

Method: Panel Least Squares

Date: 02/12/24 Time: 18:52

Sample: 2017 2022

Periods included: 6

Cross-sections included: 39

Total panel (balanced) observations: 234

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | -2.886221   | 0.791071   | -3.648500   | 0.0003 |
| SIZE     | 0.098383    | 0.024549   | 4.007538    | 0.0001 |
| LDR      | -0.147011   | 0.055403   | -2.653504   | 0.0086 |
| BOPO     | 0.202261    | 0.068990   | 2.931732    | 0.0038 |
| ROA      | 1.579244    | 0.969890   | 1.628272    | 0.1051 |
| NPL      | 0.417683    | 0.430681   | 0.969820    | 0.3334 |

Effects Specification

Cross-section fixed (dummy variables)

|                    |          |                    |                 |
|--------------------|----------|--------------------|-----------------|
| Root MSE           | 0.125257 | <b>R-squared</b>   | <b>0.612797</b> |
| Mean dependent var | 0.279886 | Adjusted R-squared | 0.525167        |

|                       |           |                          |                 |
|-----------------------|-----------|--------------------------|-----------------|
| S.D. dependent var    | 0.201726  | S.E. regression          | 0.139005        |
| Akaike info criterion | -0.940838 | Sum squared resid        | 3.671271        |
| Schwarz criterion     | -0.291119 | Log likelihood           | 154.0780        |
| Hannan-Quinn criter.  | -0.678872 | F-statistic              | 6.993006        |
| Durbin-Watson stat    | 1.655627  | <b>Prob(F-statistic)</b> | <b>0.000000</b> |

Based on Table 4.9 above, the panel data regression equation is:  

$$Y = -2.886221 + 0.098383 \times \text{SIZE} - 0.147011 \times \text{LDR} + 0.202261 \times \text{BOPO} + 1.579244 \times \text{ROA} + 0.417683 \times \text{NPL}$$

The conclusions that can be drawn from the panel data regression equation above are as follows:

1. The constant coefficient value of  $-2.886221$  indicates that if the variables Size ( $X_1$ ), LDR ( $X_2$ ), BOPO ( $X_3$ ), ROA ( $X_4$ ), and NPL ( $X_5$ ) are held constant, the Capital Adequacy Ratio (Y) would be  $-2.886221$ .
2. The regression coefficient value for the Bank Size variable ( $X_1$ ), which is  $0.098383$ , is positive. This implies that if the Bank Size variable ( $X_1$ ) increases by 1 unit, the Capital Adequacy Ratio (Y) will increase by  $0.098383$ .
3. The regression coefficient value for the LDR variable ( $X_2$ ) is  $-0.147011$ , which is negative. This indicates that if the LDR variable ( $X_2$ ) increases by 1 unit, the Capital Adequacy Ratio (Y) will decrease by  $0.147011$ .
4. The regression coefficient value for the BOPO variable ( $X_3$ ) is  $0.202261$ , which is positive. This means that if the BOPO variable ( $X_3$ ) increases by 1 unit, the Capital Adequacy Ratio (Y) will increase by  $0.202261$ .
5. The regression coefficient value for the ROA variable ( $X_4$ ) is  $1.579244$ , which is positive. This suggests that if the ROA variable ( $X_4$ ) increases by 1 unit, the Capital Adequacy Ratio (Y) will increase by  $1.579244$ .
6. The regression coefficient value for the NPL variable ( $X_5$ ) is  $0.417683$ , which is positive. This indicates that if the NPL variable ( $X_5$ ) increases by 1 unit, the Capital Adequacy Ratio (Y) will increase by  $0.417683$ .

Table 11. Simultaneous Significance Test Results (F)  
 Effects Specification

|                                       |           |                          |                 |
|---------------------------------------|-----------|--------------------------|-----------------|
| Cross-section fixed (dummy variables) |           |                          |                 |
| Root MSE                              | 0.125257  | <b>R-squared</b>         | <b>0.612797</b> |
| Mean dependent var                    | 0.279886  | Adjusted R-squared       | 0.525167        |
| S.D. dependent var                    | 0.201726  | S.E. of regression       | 0.139005        |
| Akaike infocriterion                  | -0.940838 | Sum squared resid        | 3.671271        |
| Schwarz criterion                     | -0.291119 | Log likelihood           | 154.0780        |
| Hannan-Quinn criter.                  | -0.678872 | F-statistic              | 6.993006        |
| Durbin-Watson stat                    | 1.655627  | <b>Prob(F-statistic)</b> | <b>0.000000</b> |

Because Prob (F-statistic) is  $<0.05$ , all variables of Size, LDR, BOPO, ROA and NPL simultaneously affect CAR.

Table 12. Results of the Coefficient of Determination (R<sup>2</sup>)  
 Effects Specification

| Cross-section fixed (dummy variables) |           |                          |                 |
|---------------------------------------|-----------|--------------------------|-----------------|
| Root MSE                              | 0.125257  | <b>R-squared</b>         | <b>0.612797</b> |
| Mean dependent var                    | 0.279886  | Adjusted R-squared       | 0.525167        |
| S.D. dependent var                    | 0.201726  | S.E. of regression       | 0.139005        |
| Akaike infocriterion                  | -0.940838 | Sum squared resid        | 3.671271        |
| Schwarz criterion                     | -0.291119 | Log likelihood           | 154.0780        |
| Hannan-Quinn criter.                  | -0.678872 | F-statistic              | 6.993006        |
| Durbin-Watson stat                    | 1.655627  | <b>Prob(F-statistic)</b> | <b>0.000000</b> |

The percentage change in the dependent variable (Y) resulting from the independent variables (X) is assessed using the coefficient of determination (R<sup>2</sup>). In this study, the R<sup>2</sup> value is 61.28%. This indicates that 61.28% of the variability in the Capital Adequacy Ratio (CAR) can be explained by the Size, LDR, BOPO, ROA, and NPL variables, while the remaining 41.72% is attributable to factors outside the research model.

Dependent Variable: CAR  
 Method: Panel Least Squares  
 Date: 02/12/24 Time: 18:52  
 Sample: 2017 2022  
 Periods included: 6  
 Cross-sections included: 39  
 Total panel (balanced) observations: 234

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | -2.886221   | 0.791071   | -3.648500   | 0.0003 |
| SIZE     | 0.098383    | 0.024549   | 4.007538    | 0.0001 |
| LDR      | -0.147011   | 0.055403   | -2.653504   | 0.0086 |
| BOPO     | 0.202261    | 0.068990   | 2.931732    | 0.0038 |
| ROA      | 1.579244    | 0.969890   | 1.628272    | 0.1051 |
| NPL      | 0.417683    | 0.430681   | 0.969820    | 0.3334 |

Effects Specification

| Cross-section fixed (dummy variables) |           |                          |                 |
|---------------------------------------|-----------|--------------------------|-----------------|
| Root MSE                              | 0.125257  | <b>R-squared</b>         | <b>0.612797</b> |
| Mean dependent var                    | 0.279886  | Adjusted R-squared       | 0.525167        |
| S.D. dependent var                    | 0.201726  | S.E. of regression       | 0.139005        |
| Akaike info criterion                 | -0.940838 | Sum squared resid        | 3.671271        |
| Schwarz criterion                     | -0.291119 | Log likelihood           | 154.0780        |
| Hannan-Quinn criter.                  | -0.678872 | F-statistic              | 6.993006        |
| Durbin-Watson stat                    | 1.655627  | <b>Prob(F-statistic)</b> | <b>0.000000</b> |

The results of the hypothesis testing (t-test) are obtained by comparing the calculated t-value with the t-table value. If the calculated t-value exceeds the t-table value, the proposed hypothesis can be accepted. The calculated t-value is derived from the t-statistic in the regression results table, while the

t-table value is obtained using a significance level of 0.05 and a degrees of freedom (df) value. In this case, the df value is 232 ( $df = n - k = 234 - 2$ ), leading to a t-table value of 1.97.

The testing criteria for the hypothesis (t-test) are as follows:

- $H_0$  is accepted if  $t_{count} < t_{table}$  or the probability value  $> 0.05$
- $H_0$  is rejected if  $t_{count} > t_{table}$  or the probability value  $< 0.05$

The following results were obtained from this test:

a. **Bank Size ( $X_1$ )** has a t-value of 4.007538, which is greater than the t-table value of 1.97, and a probability value of 0.0001, which is less than 0.05. Thus, it can be concluded that Bank Size significantly affects the Capital Adequacy Ratio. The hypothesis proposed by the author that Bank Size has a positive effect on the Capital Adequacy Ratio is supported by the results.

b. **Loan to Deposit Ratio ( $X_2$ )** has a t-value of -2.653504, which is less than -1.97, and a probability value of 0.0086, which is less than 0.05. Therefore, it can be concluded that the Loan to Deposit Ratio significantly affects the Capital Adequacy Ratio. The hypothesis proposed by the author that the Loan to Deposit Ratio has a negative effect on the Capital Adequacy Ratio is supported by the results.

c. **Operating Expenses/Operational Income ( $X_3$ )** has a t-value of 2.931732, which exceeds the t-table value of 1.97, and a probability value of 0.0038, which is less than 0.05. Hence, it can be concluded that Operating Expenses/Operational Income affects the Capital Adequacy Ratio. The hypothesis proposed by the author that Operating Costs of Operational Income have a positive effect on the Capital Adequacy Ratio is corroborated by the results.

d. **Return on Assets ( $X_4$ )** has a t-value of 1.628272, which is less than the t-table value of 1.97, and a probability value of 0.1051, which exceeds 0.05. Thus, it can be concluded that Return on Assets does not significantly affect the Capital Adequacy Ratio. The hypothesis proposed by the author that Return on Assets has a positive effect on the Capital Adequacy Ratio is not proven.

e. **Non-Performing Loans (NPL) ( $X_5$ )** has a calculated t-value of 0.969820, which is less than the t-table value of 1.97, and a probability value of 0.3334, which is greater than 0.05. Therefore, it can be concluded that Non-Performing Loans do not significantly affect the Capital Adequacy Ratio. The hypothesis proposed by the author that Non-Performing Loans have a negative effect on the Capital Adequacy Ratio is not proven.

### **3.1 Discussion of Research Result:**

Based on the results of the analysis and testing conducted in this study, the discussion of the research findings will be presented next to validate the hypotheses in accordance with the theories utilized and previous research that serves as the foundation for this study. From the data analysis outlined above, two variables positively influence the Capital Adequacy Ratio: Bank Size and BorPor (Operating Expenses/Operational Income). One variable negatively affects the Capital Adequacy Ratio, which is the Loan to Deposit Ratio. Meanwhile, the other two variables, Return on Assets (ROA) and Non-Performing Loans (NPL), do not significantly impact the Capital Adequacy Ratio.

#### **1. The Influence of Bank Size on Capital Adequacy Ratio (CAR)**

Bank size refers to the overall scale of a bank, whether large or small. It can be measured in terms of total assets, sales, and market capitalization. A larger bank typically has greater sales, assets, and market capitalization, which facilitates better management of its capital adequacy for future distribution. This analysis aligns with previous research by Dewi and Yadnya [2], which indicates that Bank Size has a significant effect on CAR.

#### **2. The Influence of Loan to Deposit Ratio (LDR) on the Capital Adequacy Ratio (CAR)**

The Loan to Deposit Ratio (LDR) is closely related to the Capital Adequacy Ratio (CAR). If a bank effectively channels its capital through loans to borrowers (the general public) according to its targets, this will significantly impact its profitability. Conversely, if the LDR is not effectively utilized, it can negatively affect the bank's income and capital turnover. The results of this analysis are consistent with previous research by Riantor and Salim [8], which states that LDR has a significant negative impact on CAR.

### 3. The Influence of Operating Expenses to Operating Income (BorPor) on the Capital Adequacy Ratio (CAR)

BorPor is a ratio that measures a bank's ability to control its operational costs in relation to its operational income. Banks may experience losses when their operational costs are too high, which will subsequently need to be covered by capital. Thus, it can be concluded that improving operational cost efficiency can reduce capital adequacy. A higher BorPor ratio indicates less efficiency in conducting business activities [5]. The results of this analysis align with previous research by Putri (2017), which states that BorPor has a significant positive effect on CAR.

### 4. The Influence of Return on Assets (ROA) on the Capital Adequacy Ratio (CAR)

Profitability, often indicated by ROA, reflects company performance but does not always have a direct impact on CAR in every context. ROA measures profitability performance in the short term, while CAR more accurately reflects a bank's resilience to future risks. A high ROA in one period does not necessarily lead to a direct effect on CAR, especially if the profits are not added to the core capital. CAR is calculated based on the bank's own capital relative to risk-weighted assets, whereas ROA only reflects the profitability of total assets. CAR is influenced by various factors, including asset quality, asset risk level, and capital reserve policy. The analysis results contradict previous research by Setiawan and Muchtar (2021), which stated that ROA has a significant positive effect on CAR. However, according to Borkhari et al. (2019), it is noted that ROA does not impact CAR.

### 5. The Impact of Non-Performing Loans (NPL) on the Capital Adequacy Ratio (CAR)

Non-Performing Loans (NPL) represent the ratio of total problematic loans to the total loans granted to borrowers. The NPL variable does not always have a direct impact on the Capital Adequacy Ratio (CAR) in every context due to several factors that may explain the lack of significant correlation. A bank may implement strong risk management strategies to address non-performing loans. It can establish reserves, ensure sufficient capital increases, or restructure loans to mitigate the impact of NPL on capital, thereby keeping the Capital Adequacy Ratio (CAR) stable even as NPLs rise. The analysis results contradict the research by Margaretha (2018), which states that NPL has a negative and significant impact on CAR. However, according to the study by Anjani and Purnawati (2023), NPL does not affect CAR.

## 4. CONCLUSION

Bank size has a positive effect on the Capital Adequacy Ratio (CAR) of banking companies listed on the Indonesia Stock Exchange from 2017 to 2022. The Loan to Deposit Ratio (LDR) negatively affects the CAR of banking companies listed on the Indonesia Stock Exchange during the same period. Additionally, the Operating Expenses to Operating Income Ratio (BorPor) has a positive effect on the CAR of these banking companies. Conversely, Return on Assets (ROA) does not impact the CAR of banking companies listed on the Indonesia Stock Exchange from 2017 to 2022. Similarly, Non-Performing Loans (NPL) do not have an effect on the CAR of banking companies in this period.

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