

# DETERMINANTS OF COMMERCIAL BANK PERFORMANCE WITH GUARANTEE INTEREST AS MODERATING VARIABLES IN BANKS LISTED ON IDX 2016 – 2020

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## ABSTRACT

This study aims to analyze and examine the effect of the Efficiency Ratio (BOPO), Capital Adequacy Ratio (CAR), Loan To Deposit Ratio (LDR), Non-Performing Loan (NPL), Size (SIZE) with LPS Guarantee Interest Rate (SBP) as a moderating variable on the Return On Assets (ROA) of Commercial Banks listed on the Indonesia Stock Exchange for the 2016-2020 period. The sampling method used is purposive sampling, including the observation of 38 commercial banks listed on the Indonesia Stock Exchange from 2016 to 2020. The statistical analysis method used is a descriptive quantitative method with the type of data being time series and cross-section using moderated regression analysis method (MRA). The results showed that the determinants of Operating Costs with Operating Income (BOPO) and Guarantee Interest Rate (SBP) had a positive and significant effect on Return On Assets (ROA), Non Performing Loans (NPL) had a significant negative effect on Return On Assets (ROA). The Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR) and Bank Size (SIZE) do not affect Return On Assets (ROA). The results of the Moderating Guarantee Interest Rate (SBP) moderate the effect of Operating Costs with Operating Income (BOPO) and moderate the effect of Non-Performing Loans (NPL) on Return On Assets (ROA). It is believed that the Guaranteed Interest Rate (SBP) has force power as a determinant of the level of profitability or performance of the bank, either directly or indirectly.

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## INTRODUCTION

Based on Law Number 7 of 1992 concerning Banking as amended by Law Number 10 of 1998, a Bank is a business entity that collects funds from the public in the form of deposits, and the bank distributes its funds to the public in the form of credit and or other forms to improve company finances. The banking world is one of the institutions that play an essential role in a nation's economy, especially in the field of economic financing. In carrying out its functions, a

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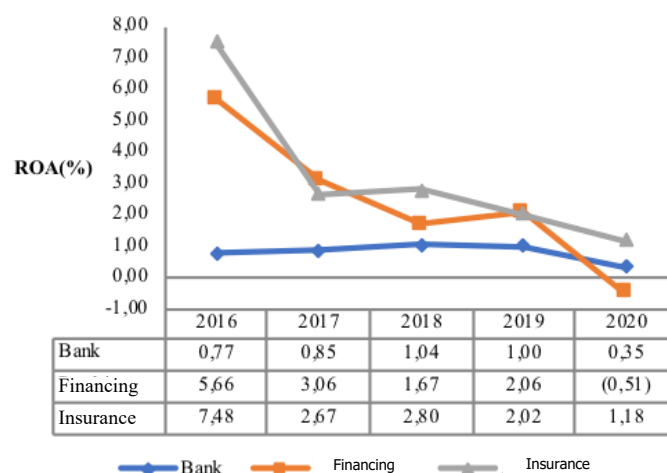
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bank requires funds to finance banking activities. It could be said to be the heart of a country, especially for developing countries. Banks accept deposits from the public (third-party funds) through savings, current accounts, and time deposits (Irawan & Syarif, 2019).

In carrying out its functions, bank performance is influenced by the level of public trust, so banks need to keep up good performance (Safitri, Kadarningsih, Din, & Rahayu, 2020). Poor bank performance will fail and lead to a financial crisis which will have a negative impact on economic development (Zuzevičiūtė, Pranevičienė, Simanavičienė, & Vasiliauskienė, 2017). Bank performance is reflected in the level of profitability, which is essential information for investors, the public, and the bank itself (Supiyadi & Meta, 2016). Profitability or performance is the main factor in improving the reputation of the bank because it creates profit or profit between the bank and stakeholders, especially investors (Adedeji, 2018). Bank performance is usually used as the highest weight for the assessment of internal and external functions. Internal determinants are strongly influenced by bank management decisions and objective policies or strategy, such as liquidity (LDR), capital adequacy (CAR), expenditure (BOPO), and bank size (SIZE) (Fitsum & Asmerom, 2016).

For this reason, banks must be able to build trust from the public through the bank's soundness level (Pratiwi & Wiagustini, 2015). Bank soundness level (TKS) is a qualitative assessment of various aspects that affect the condition or performance of a bank through quantitative and/or qualitative assessments on capital factors, asset quality, management, performance, liquidity and risk treatment. According to the Regulation of the Financial Services Authority of the Republic of Indonesia Number: 4/POJK.03/2016 concerning Assessment of the Soundness of Commercial Banks (Regulation, 2016), Banks are required to conduct an assessment of the soundness of banks using the risk approach (RBBR). This system assesses the soundness of the bank through a self-assessment by assessing the risk profile, Good Corporate Governance (GCG), profitability (profit), and bank capital. The risk profile consists of eight risks, one of which is measured by financial ratios, consisting of credit risk and liquidity risk. The credit risk is measured using the ratio of non-performing loans to loans (NPL) while Liquidity Risk is measured using the ratio between loans to third party funds (LDR). GCG is a factor of good corporate governance, considering the profitability self-assessment. The indicators are Return On Assets (ROA) and Net Interest Margin (NIM), while the capital factor is measured by the capital adequacy ratio (CAR). This study uses ROA because ROA focuses more on calculating the effectiveness of a bank in managing assets to produce all and/or part of assets whose funds come from public deposits or third party funds. As for asset management, banks are influenced by other factors such as loan-to-deposit ratio (LDR), capital adequacy ratio (CAR), non-performing loans (NPL), and operating costs compared to operating income (BOPO) and third party funds (DPK) (Sawitri, 2018).

Based on data obtained from the Indonesia Stock Exchange (IDX) obtained different levels of ROA fluctuations, especially in the banking sector, which tends to be stable compared to other sub-sectors, it can be seen in Figure 1.



**Figure 1. The phenomenon of ROA Financial Ratios IDX Financial Sub-Sector Period 2016 – 2020**

Source: IDX Annually Statistics 2016 – 2020 (IDX, 2020)

Figure 1 shows the movement of banking ROA, in general, is relatively stable. At the same time, ROA fluctuations are around 0.35% points at the end of 2020, with the highest fluctuation with 1.04% points in 2018. The Financing sub-sector and Insurance sub-sector are more unstable, where ROA was very high in 2016 and then tends to decline steadily. From 2017 to 2020, ROA for the Financing sub-sector and the Insurance sub-sector decreased. This phenomenon needs to be investigated and tested further as a gap phenomenon in the Banking sub-sector to see the determinants in the Banking sector, which tend to be stable compared to other sub-sectors.

The results of observations on previous research through journals/articles were obtained. The gap is the results of different studies related to the determinants that affect bank performance can be seen in Table 1.

**Table 1  
Research gap**

| NO | Researchers                       | Title  | Methods                             |         |        |         |         |         |
|----|-----------------------------------|--|-------------------------------------|---------|--------|---------|---------|---------|
|    |                                   |  | Analysis                            | BOPO    | CAR    | NPL     | LDR     | SIZE    |
| 1  | Akbar and Lanjarsih (2019)        | The influence of corporate governance as a moderating variable of bank profitability performance   | Panel Data Regression               | Not Sig |        | Not Sig | Not Sig |         |
| 2  | Sofyan (2019)                     | Analysis of Financial Performance of Rural Banks in Indonesia                                      | Panel Data Regression               | (-)Sig  | (+)Sig | Not Sig | (+)Sig  |         |
| 3  | Robin, Salim, and Bloch (2018)    | Financial performance of commercial banks in the post-reform era: Further evidence from Bangladesh | Panel Data Regression               |         |        |         |         | Not Sig |
| 4  | Al-Homaidi, Almaqtari, Yahya, and | Internal and external determinants of listed commercial  | Multiple Variable Linear Regression |         | (-)Sig |         |         | (-)Sig  |

| NO | Researchers                          | Title   | Methods                             |        |        |        |         |        |
|----|--------------------------------------|---|-------------------------------------|--------|--------|--------|---------|--------|
|    |                                      |   | Analysis                            | BOPO   | CAR    | NPL    | LDR     | SIZE   |
|    | Khaled (2020)                        | banks' profitability in India: dynamic GMM approach                         |                                     |        |        |        |         |        |
| 5  | Letty (2017)                         | Factors Affecting Indonesian Banking Financial Performance                  | Multiple Variable Linear Regression | (+)Sig | (+)Sig |        |         | (+)Sig |
| 6  | Okere, Isiaka, and Ogunlowore (2018) | Risk Management And Financial Performance Of Deposit Money Banks In Nigeria | Regression Analysis                 |        | (+)Sig | (+)Sig | Not Sig |        |

Source: Article and Journal Processing from Google Scholar

Based on Table 1, it can be seen that there is an inconsistency in the results of previous research that creates bias or doubts in using financial ratios in assessing bank performance. Therefore, further research is needed to obtain confidence through re-verification related to financial ratios that impact the bank's performance. On the other hand, in the population of 4 (four) large banks in Indonesia, the results show that the determination of the guarantee interest rate (SBP) and the Bank Indonesia interest rate (BI rate) has a direct or indirect contribution to indirectly becomes a moderator who can strengthen and weaken the influence of the growth of savings, time deposits, securities and credit on the Net Interest Margin (NIM) ratio (William, 2012). It is necessary to conduct further research on the direct and indirect effects of the Guarantee Interest Rate on the bank's performance.

This research is based on the inconsistency of research results both nationally and internationally which results in doubts about the use of financial ratio tools in viewing financial performance, especially banking. This research will gain confidence in the use of these financial ratio tools in assessing bank performance. In addition, the theoretical benefits of the research results are for the development of knowledge related to the object of research including further development related to bank financial ratios, supervision of banks, bank guarantees (deposit insurance) and performance of banks on the Exchange and in banks

### Agency Theory

Agency theory essentially explains the relationship between two parties in one company, where one party acts as an agent and the other party as the principal. In Agency Theory, the agent in question is the management of the company, who is actively responsible for managing the company. In comparison, the principal is the shareholder or owner of the company who is usually more passive in managing the company. Differences in interests between the agent and principal lead to information asymmetry between the two parties and increase agency costs, and this is often a conflict caused by information asymmetry. Agents or company management have more complete and accurate information about the company's condition than the information held by the principal and shareholders.

### Signaling Theory

Signaling theory explains companies' encouragement to publish or provide information about their financial statements to external parties because of the asymmetry of the information held by companies to outside parties. Signaling theory suggests the importance of information issued by companies in making investment decisions. Information is essential for investors and business people because the information provided by the company contains

records or descriptions of the company that occurred in the past, present and future for the company or the capital market financial statements correctly so that the share value increases.

### **Economies of Scale**

The theory found that large companies are more profitable than small companies in the same industry. Like other researchers, Schmalensee uses total assets (assets) as a proxy for company size, and measuring the level of accounting profit is represented by profit margin and return on assets. The previous research conducted by Schmalensee (1989) showed that firm size and profitability were not significantly related when companies in an industry were grouped into sub-industry. Thus the same researcher produces different findings. The current theory of the company is not strong enough to explain whether large companies are more profitable than small companies (Kaen & Baumann, 2003). Dhawan (2001), who examined the relationship between firm size and firm productivity in the United States between 1970 and 1989, found the opposite result. Dhawan shows that profitability, as measured by return on assets, is negatively related to firm size. The size of the bank will have a negative effect on the bond rating. The higher the size of the bank, the higher the rate of return from bonds, which in turn has an impact on the reduced return of the bank overall (Lestari & Syarif, 2020).

### **Theory of Deposits Guarantee**

Interest Rates (SBP) affect people's interest in saving their money in banks, while the BI rate will impact the number of credit requests and securities distribution. In the conclusion of his research (William, 2012), it is stated that policies related to the pricing process, both for deposit interest and loans/other productive assets, must pay attention to the determination of the interest rate, namely the Guaranteed Interest Rate (SBP). Moreover, Bank Indonesia Interest Rate (BI rate). This is because the two benchmark interest rates have force power that can force deposit and bank loan interest rates to follow their movements. Therefore, these two types of interest rates become very vital as a determinant of the level of bank profitability. The intense interaction between the Guarantee Interest Rate (SBP) and the Savings Growth rate requires bank management to be more careful with SBP because it significantly affects the volume of savings so that it can help or weaken the negative influence of TPF products on bank profitability. This shows the moderating effect of SBP movement on other internal ratios on the bank's profitability.

### **Operating Efficiency Ratio (BOPO)**

One indicator to measure bank efficiency is the comparison between operating costs and operating income (BOPO), which is the comparison between operating costs, including interest expense and operating income, including interest income. The greater the BOPO ratio, the more inefficient a bank is. Bank efficiency is said to be improving, as indicated by a decrease in the value of BOPO. The BOPO ratio is an efficiency ratio used to measure the ability of bank management to control operational costs against operating income. The smaller this ratio means, the more efficient the operational costs incurred by the bank so that the possibility of a bank in troubled conditions is getting smaller (Fahmi, 2012).

On the other hand, the bank's BOPO significantly negatively affects the bank's ROA (Fikri & Dewi, 2020). The higher the BOPO, the higher the administrative costs or credit risk reserves which decrease the bank's NIM or ROA level. The BOPO ratio in this study is proxied by the following formula:

$$\text{BOPO} = \frac{\text{Total Operating Expense}}{\text{Total Operating Income}} \times 100\%$$

### Capital Adequacy Ratio (CAR)

The CAR known in the field of supervision as RWA is 'Risk Weighted Asset,' which in English is known as RWA (Risk Weighted Asset). As the name implies, RWA is the total assets of a bank based on the risk profile of each of these assets. The higher the CAR means, the higher the own capital to fund productive assets, so the cost of funds will be lower, which will further increase the bank's ROA. On the other hand, the lower the capital, the higher the cost of funds and the lower the ROA of the bank (Mulyono, 1995). A bank's CAR significantly positively affects a bank's ROA (Fikri & Dewi, 2020). The higher the Capital Adequacy Ratio (CAR), the greater the financial resources that can be used for business and to anticipate potential losses caused by credit disbursement, such as non-performing loans. The formula for calculating CAR is:

$$\text{CAR} = \frac{\text{Modal}}{\text{Risk Weighted Assest (ATMR)}} \times 100\%$$

### Loan to Deposit Ratio (LDR)

LDR is a measure of the ability of banking companies to refinance funds withdrawn by customers or depositors by relying on credit as a source of liquidity. A healthy LDR can fulfill two functions, including the need for credit disbursement to encourage economic growth and controlling banks' soundness. LDR is used to see the ability of banks to provide funds owned by banks or funds collected from the public to debtors. The lower the LDR of a bank, the more liquid it will be, resulting in an idle fund that causes ROA to fall and vice versa. The larger the LDR, the more the company has good financial performance (Slamet, 2006).

On the other hand, a bank's LDR significantly negatively affects a bank's ROA (Fikri & Dewi, 2020). The higher the LDR, the lower the level of the prudence of the bank in providing credit, which decreases the bank's NIM or ROA level. The LDR calculation formula is:

$$\text{LDR} = \frac{\text{Total Credit}}{\text{Total Third Party Funds}} \times 100\%$$

### Non-Performing Loan (NPL)

Non-Performing Loan is a ratio that shows the ability of bank management to manage non-performing loans provided by banks. So that the higher this ratio, the worse the quality of bank credit, causing the number of non-performing loans to be greater, so the possibility of a bank in a problematic condition is more excellent (Harun, 2016). On the other hand, the bank's NPL has no significant effect on the bank's ROA (conditions during the COVID 19 pandemic) (Fikri & Dewi, 2020). The formula for calculating NPL is:

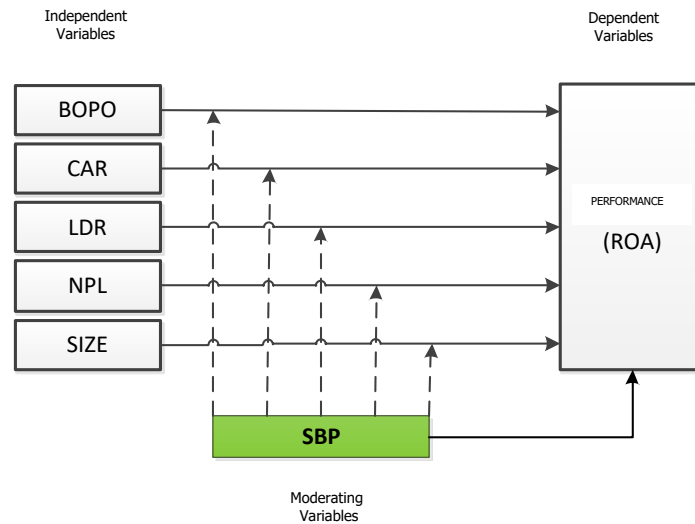
$$\text{NPL} = \frac{\text{Substandard Credit, Doubtful, and Loss}}{\text{Total Credit}} \times 100\%$$

### Firm Size (SIZE)

Profitability differs with the size of the bank. Bank size has a significant positive effect on interest margin or nim (Demirgüç-Kunt & Huizinga, 1999). Larger banks are generally more profitable given their higher levels of technical efficiency. An empirical study on MENA banks showed a positive correlation between bank size and the profitability or performance of a company. (Olson & Zoubi, 2011). The SIZE calculation formula is:

$$\text{Size} = \text{Ln}(\text{Asset})$$

In this study, under the theoretical study above, logic can be drawn up that the Guarantee Interest Rate (SBP) serves as a moderating variable that influences banking performance listed on the IDX.



**Figure 2. Framework**

The development of the framework of thinking obtained the results of the research hypothesis as follows:

- H1 : BOPO has a significant negative effect on ROA;
- H2 : CAR has a significant positive effect on ROA;
- H3 : LDR has a significant positive effect on ROA;
- H4 : NPL has a significant negative effect on ROA;
- H5 : Bank size (SIZE) has a significant positive effect on ROA;
- H6 : Guarantee Interest Rate (SBP) has a significant positive effect on ROA;
- H7 : SBP moderates the effect of BOPO on ROA;
- H8 : SBP moderates the effect of CAR on ROA;
- H9 : SBP moderates the effect of LDR on ROA;
- H10 : SBP moderates the effect of NPL on ROA;
- H11 : SBP moderates the effect of SIZE on ROA;

## **METHOD**

This study utilizing quantitative study, moreover based on the 46 banks listed on the Indonesia Stock Exchange, 38 commercial banks meet the criteria for the research sample. The period observed in this study is from 2016 to 2020. Thus, the number of annual reports observed is 190 Bank annual reports. The sample selection process is as follows:

**Table 2**  
**Sample Selection Process**

| NO.                            | DESCRIPTION                                    | TOTAL      | DESCRIPTION  |
|--------------------------------|--|------------|--|
| A.                             | The population on the Indonesia Stock Exchange | 46         | Position as of April 28, 2021, on the IDX                  |
| B.                             | Listed on the IDX after 2015                   | (2)        | Include in the population if registered before 2016        |
| C.                             | A merger between 2016 and 2020                 | (2)        | Mergers after 2015 were then excluded from the population. |
| D.                             | Islamic Banks                                  | (4)        |  |
| E.                             | Number of Samples                              | 38         |  |
| F.                             | <b>Observations from 2016 to 2020</b>          | 5<br>Years |  |
| <b>Total Observation (EXF)</b> |  | <b>190</b> |  |

Note:

- A. Bank Amar Indonesia Tbk. and Bank Bisnis Internasional Tbk.
- B. Bank IBK Indonesia Tbk and Bank Danamon Indonesia Tbk.
- C. Bank Net Indonesia Syariah Tbk., Bank Syariah Indonesia Tbk., Bank BTPN Syariah Tbk., and Bank Panin Dubai Syariah Tbk.

From the total population of 46 banks, the samples used in this study were 38 banks that met the criteria. Data collection techniques were obtained from secondary data, namely library research and data from the internet site [www.IDX.co.id](http://www.IDX.co.id) in the form of information and annual financial reports for Commercial Banks during the 2016-2020 period. For Guarantee Interest Rate Data (SBP) is obtained from data from the Deposit Insurance Corporation (LPS) website [www.lps.go.id](http://www.lps.go.id). Data related to banking arrangements are obtained from the website of the Financial Services Authority [www.ojk.go.id](http://www.ojk.go.id) and from Bank Indonesia from [www.lps.go.id](http://www.lps.go.id).

The analytical method used in this study is a quantitative method, a form of analysis that uses numbers and calculations as well as statistical techniques. The E-Views application is used to classify data into specific categories and facilitate analysis. In addition, a descriptive analysis was carried out, namely the analysis used to discuss quantitative data in the form of an analysis of the ratios to find the value or determinant figures by knowing the mean, minimum, maximum, and standard deviation values. Testing Moderate Regression Analysis was conducted to test the moderating variables using the interaction test. The MRA statistical equation is as follows:

$$Y = +_1*BOPO +_2*CAR + \beta_3*LDR +_4*NPL +_5*SIZE +_6*SBP +_7*SBP*BOPO +_8 *SBP*CAR + \beta_9*SBP*LDR +_{10} *SBP*NPL +_{11}*SBP*SIZE + e$$

Description:

- Y : Dependent Variable (ROA)
- BOPO : Operating Expenses compared to Operating Income
- CAR : Capital Adequation Ratio
- LDR : Loan to Debt Ratio
- NPL : Non Performing loan



|                |   |
|----------------|---|
| Size           | : Total Asset Bank  |
| SBP            | : Interest Rate   |
| A              | : Constant  |
| $-\beta_{i11}$ | : Regression coefficient  |
| e              | : Error Term, which is the error rate of the estimator in the study |

## RESULTS AND DISCUSSION

### A. Descriptive Statistical

Analysis Descriptive analysis is the analysis used to discuss quantitative data. Analysis of the ratios was carried out to find the value or numbers of the X variable (BOPO, CAR, LDR, NPL, SIZE, SBP, Y variable (ROA) and Z Moderation (Guarantee Interest Rate/SBP).

**Table 3**  
**Descriptive Statistical Analysis Results**

|           | ROA     | BOPO    | CAR     | LDR     | NPL    | LNSIZE   | SBP    |
|-----------|---------|---------|---------|---------|--------|----------|--------|
| Mean      | 0,61%   | 94,85%  | 25,20%  | 85,88%  | 3,56%  | 1740,13% | 6,413% |
| Median    | 0,98%   | 90,09%  | 21,22%  | 86,24%  | 2,92%  | 1709,61% | 6,167% |
| Maximum   | 4,00%   | 261,10% | 148,28% | 163,00% | 22,27% | 2113,66% | 7,222% |
| Minimum   | -15,89% | 58,20%  | 9,01%   | 39,33%  | 0,00%  | 1340,71% | 5,875% |
| Std. Dev. | 2,649%  | 29,06%  | 16,90%  | 18,69%  | 2,65%  | 182,99%  | 0,58%  |

Source: Secondary Data Processing, 2021

Based on the results of descriptive statistical analysis in table 3, it is known that the Return on Asset (ROA) has a minimum value of negative 15.89% and a maximum value of 4.00%, with an average value of 0.61% and a standard deviation of 2.65%. The average ROA value is 0.7249%, meaning that the bank's financial performance in the entire sample is relatively low. This means that the banks that went public during the observation period had a poor ability to print profits.

Operating Cost to Operating Income (BOPO) has a minimum value of 58.20% and a maximum value of 261.10%, with an average value of 94.84% and a standard deviation of 29.06%. Meanwhile, the average BOPO value is 94.85%, where this figure exceeds the BOPO standard set by Bank Indonesia, which is a maximum of 80%. In carrying out their operational activities, the go-public banks have been unable to control their operational costs efficiently.

The Capital Adequacy Ratio (CAR) has a minimum value of 9.01% and a maximum value of 148.28%, with an average value of 94.85% and a standard deviation of 16.90%. The average CAR value is 25.20%, meaning that the bank's capital capacity in the entire sample is quite good and has met the standards set by Bank Indonesia, which is at least 8%. The standard deviation value is 16.90%, meaning a deviation of 16.90% from the average CAR value.

The Loan to Deposit Ratio (LDR) has a minimum value of 39.33% and a maximum value of 163.0%, with an average value of 85.88% and a standard deviation of 18.69%. The average LDR value is under the standards set by Bank Indonesia, which is in the range of 80%-92%. This means that the intermediation function of commercial banks listed on the Indonesia Stock Exchange operating during the observation period has been running quite well. The standard deviation value is 18.69%, meaning a deviation of 18.69% from the average LDR value.

Non-Performing Loan (NPL) has a minimum value of 0%, a maximum value of 22.27%, an average value of 3.56%, and a standard deviation of 2.65%. The average NPL value is 3.56%, where this figure is still at a maintained level or below the standard set by Bank Indonesia, which is a maximum of 5%. The standard deviation value is 2.65%, meaning a deviation of 2.65% from the average NPL value.

Using the natural log calculation, bank size (Size) has a minimum value of 1340.71%, a maximum value of 2113.66% with an average value of 1740.13% and a standard deviation of 182.99%. Banks with small assets and banks with significant assets have the same level of ROA ratio even though there are differences, but the resulting ROA value is not too big.

For Banks, there is a strong interaction between the Guarantee Interest Rate (SBP) and the Savings Growth rate, which requires every bank management to pay attention to the SBP level because it significantly affects the volume of savings which can encourage or weaken the negative influence of deposit products (Third Party Funds) on the level of bank profitability or performance.

**Table 4**  
**Average Guarantee Interest Rate**

| <b>Year Ratio</b> | <b>2016</b> | <b>2017</b> | <b>2018</b> | <b>2019</b> | <b>2020</b> |
|-------------------|-------------|-------------|-------------|-------------|-------------|
| SBP               | 7,22%       | 6,17%       | 6,00%       | 6,80%       | 5,88%       |
| ROA               |             |             |             |             |             |
| Average           | 0,80%       | 0,90%       | 0,98%       | 0,73%       | 0,21%       |
| Min               | -           | -           | -           | -           | -           |
| Max               | 11,04%      | 2,28%       | 1,84%       | 3,54%       | 8,16%       |
| Mean              | 10,48%      | 3,04%       | 3,09%       | 3,12%       | 3,03%       |
|                   | 0,81%       | 0,93%       | 1,10%       | 0,63%       | 0,42%       |

Source: Data Processing Results, 2021

The average Guarantee Interest Rate decreased from 7.22% in 2016 to 5.88% in 2020. This decline was also almost the same as the average ROA of banks, which decreased from 0.80% in the 2016 period to 0.21% in 2020. It can be said that the average Guarantee Interest Rate tends to have a linear similarity to the average ROA of Commercial Banks listed on the Indonesia Stock Exchange.

**B. Panel Data Regression Method Selection**

**1. Chow Test**

Chow Test results through probability in Redundant Fixed Effect Test on E-Views 10.

**Table 5**  
**Chow Test Results**

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

| Effects Test             | Statistic | d.f.     | Prob.  |
|--------------------------|-----------|----------|--------|
| Cross-section F          | 0.624474  | (37,141) | 0.9518 |
| Cross-section Chi-square | 28.832468 | 37       | 0.8292 |

Source: Data Processing E-Views 10

Chow test in table 5, it can be concluded that the significance value of the Chi-Square Cross Section is 0.8292 greater than Alpha (> 0.05). Thus the decision taken in

the Chow test is the Common Effect Model, which is continued with the Hausman to determine between the Fixed Effect Model and Random Fixed Model.

**2. Hausman test**

The results of this test can also be seen through the F probability in Correlated Random Effects - Hausman Test on E-Views 10.

**Table 5**  
**Hausman Test Results**

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

| Test Summary         | Chi-Sq. Statistic | Chi-Sq. d.f. | Prob.  |
|----------------------|-------------------|--------------|--------|
| Cross-section random | 7.643677          | 11           | 0.7448 |

Source: E-Views Data Processing 10

The Hausman test results show the Cross-Section Random probability value of 0.7448, and the value is above Alpha (> 0.05). Based on the decision-making criteria for the Hausman described above, the model chosen is the Random Effect.

**3. Test Lagrange Multiplier**

The results of this test can also be seen through the F probability in the Lagrange Multiplier (LM) test for panel data on E-Views 10.

**Table 6**  
**Lagrange Multiplier Test Results**

| Null (no rand. effect)<br>Alternative | Cross-section         | Period                | Both                  |
|---------------------------------------|-----------------------|-----------------------|-----------------------|
|                                       | One-sided             | One-sided             |                       |
| Breusch-Pagan                         | 2.845173<br>(0.0916)  | 0.757646<br>(0.3841)  | 3.602819<br>(0.0577)  |
| Honda                                 | -1.686764<br>(0.9542) | -0.870429<br>(0.8080) | -1.808208<br>(0.9647) |
| King-Wu                               | -1.686764<br>(0.9542) | -0.870429<br>(0.8080) | -1.353736<br>(0.9121) |
| SLM                                   | -1.534176<br>(0.9375) | -0.634361<br>(0.7371) | --                    |
| GHM                                   | --                    | --                    | 0.000000<br>(0.7500)  |

Source: E-Views Data Processing 10

The probability value is indicated by the number below, negative 0.0916, where the value is less than (<0.05). Test Lagrange Multiplier shows that accepting H<sub>0</sub> means the best estimation method is Random Effect.

**C. Moderation Regression Analysis (MRA)**

Results Moderation Regression the data analysis method in this study is moderation regression analysis, which tests whether there is a significant relationship between variables through regression.

**Table 7**  
**Moderation Regression Results**

Dependent Variable: ROA  
 Method: Panel EGLS (Cross-section random effects)  
 Date: 05/25/22 Time: 08:31  
 Sample: 2016 2020  
 Periods included: 5  
 Cross-sections included: 38  
 Total panel (balanced) observations: 190  
 Swamy and Arora estimator of component variances

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | -0.048115   | 0.038734   | -1.242203   | 0.2158 |
| BOPO     | 0.053490    | 0.014719   | 3.634153    | 0.0004 |
| CAR      | 0.012930    | 0.034847   | 0.371047    | 0.7110 |
| LDR      | 0.012286    | 0.026405   | 0.465299    | 0.6423 |
| NPL      | -0.533821   | 0.172531   | -3.094053   | 0.0023 |
| SIZE     | 0.001140    | 0.002582   | 0.441472    | 0.6594 |
| SBP      | 1.959341    | 0.605370   | 3.236602    | 0.0014 |
| SBP BOPO | -2.183479   | 0.226330   | -9.647320   | 0.0000 |
| SBP CAR  | -0.128062   | 0.555520   | -0.230526   | 0.8179 |
| SBP LDR  | -0.190461   | 0.418257   | -0.455368   | 0.6494 |
| SBP NPL  | 8.499597    | 2.752727   | 3.087701    | 0.0023 |
| SBP SIZE | -0.004327   | 0.040103   | -0.107904   | 0.9142 |

Source: E-Views Data Processing 10

The following is an explanation of the results of the Moderation Regression Analysis:

$$Y = -0.048115 + 0.053490 *BOPO + 0.012930*CAR + 0.012286*LDR - 0.533821*NPL + 0.001140*SIZE + 1.959341*SBP - 2.183479*SBP*BOPO - 0.128062*SBP*CAR - 0.190461*SBP*LDR + 8.499597*SBP*NPL - 0.004327*SBP*SIZE$$

**1. F test (simultaneous)**

**Table 8**  
**F test**

Weighted Statistics

|                    |          |                    |          |
|--------------------|----------|--------------------|----------|
| R-squared          | 0.971016 | Mean dependent var | 0.006071 |
| Adjusted R-squared | 0.969225 | S.D. dependent var | 0.026490 |
| S.E. of regression | 0.004647 | Sum squared resid  | 0.003844 |
| F-statistic        | 542.1286 | Durbin-Watson stat | 2.015093 |
| Prob(F-statistic)  | 0.000000 |                    |          |

Source: E-Views Data Processing 10

In table 8, Prob (F-statistic) with a value of 0.000000 (<0.05) shows a significant effect. Thus BOPO, CAR, LDR, NPL and SIZE affect the ROA of banks listed on the IDX for 2016-2020.

**2. T-test (partial)**

**Table 9**  
**T test**

| Variable | Coefficient | Std. Error | t-Statistic | Prob.  |
|----------|-------------|------------|-------------|--------|
| C        | -0.048115   | 0.038734   | -1.242203   | 0.2158 |
| BOPO     | 0.053490    | 0.014719   | 3.634153    | 0.0004 |
| CAR      | 0.012930    | 0.034847   | 0.371047    | 0.7110 |
| LDR      | 0.012286    | 0.026405   | 0.465299    | 0.6423 |
| NPL      | -0.533821   | 0.172531   | -3.094053   | 0.0023 |
| SIZE     | 0.001140    | 0.002582   | 0.441472    | 0.6594 |
| SBP      | 1.959341    | 0.605370   | 3.236602    | 0.0014 |
| SBP BOPO | -2.183479   | 0.226330   | -9.647320   | 0.0000 |
| SBP CAR  | -0.128062   | 0.555520   | -0.230526   | 0.8179 |
| SBP LDR  | -0.190461   | 0.418257   | -0.455368   | 0.6494 |
| SBP NPL  | 8.499597    | 2.752727   | 3.087701    | 0.0023 |
| SBP SIZE | -0.004327   | 0.040103   | -0.107904   | 0.9142 |

Source: E-Views Data Processing 10

- a) The effect of BOPO on bank ROA can be seen from the regression coefficient value of BOPO ( $X_1$ ) of 0.053490, a significance of 0.0004 ( $< 0.05$ ). Thus BOPO has a positive effect on bank ROA, so hypothesis H1 is **rejected**.
- b) The effect of CAR on the Bank's ROA can be seen from the CAR ( $X_2$ ) regression coefficient of 0.012930 with a significance of 0.7110 ( $> 0.05$ ). Thus CAR has no effect on the Bank's ROA, so H2 is rejected, and the hypothesis is **rejected**.
- c) The effect of LDR on the Bank's ROA can be seen from the regression coefficient value of LDR ( $X_3$ ) of 0.012286 with a significance of 0.6423 ( $> 0.05$ ). Thus LDR does not affect the Bank's ROA, and the hypothesis is **rejected**.
- d) The effect of NPL on bank ROA can be seen from the regression coefficient value of NPL ( $X_4$ ) of -0.533821 significance of 0.0023 ( $<0.05$ ). Thus, NPL( $X_4$ ) negatively affects Bank's ROA, so the hypothesis is **accepted**.
- e) The effect of SIZE on the Bank's ROA can be seen from the regression coefficient value of SIZE ( $X_5$ ) of 0.001140 with a significance of 0.6594 ( $> 0.05$ ). Thus SIZE( $X_5$ ) does not affect Bank's ROA. Thus the hypothesis is **rejected**.
- f) The effect of SBP on the Bank's ROA can be seen from the regression coefficient value of SBP ( $X_6$ ) of 1.959341 with a significance value of 0.0014 ( $< 0.05$ ), then the hypothesis is **accepted**.
- g) The Guarantee Interest Rate (SBP) moderates the effect of BOPO on ROA by 0.0000 ( $<0.05$ ). Thus SBP moderates the effect of BOPO on ROA, so hypothesis H7 is **accepted**.
- h) SBP moderates the effect of CAR on ROA by 0.8179 ( $>0.05$ ). Thus SBP does not moderate the effect of CAR on ROA, so hypothesis H8 is **rejected**.
- i) SBP moderated the relationship between LDR and ROA by 0.6494 ( $>0.05$ ). Thus SBP did not moderate the effect of LDR on ROA, so hypothesis H9 was **rejected**.
- j) SBP moderates the effect of NPL on ROA by 0.0023 ( $<0.05$ ). Thus, SBP moderates the effect of NPL on ROA, meaning that hypothesis H10 is **accepted**.
- k) SBP moderates the effect of SIZE on ROA by 0.9142 ( $>0.05$ ). Thus, SBP does not moderately SIZE on ROA, so Hypothesis H11 is **Rejected**.

### 3. Coefficient of Determination ( $R^2$ )

The coefficient of determination ( $R^2$ ) is used to explain how large the independent variable can explain the proportion of variation in the dependent variable.

**Table 10**  
**Coefficient of determination**

| Weighted Statistics |          |                    |          |
|---------------------|----------|--------------------|----------|
| R-squared           | 0.971016 | Mean dependent var | 0.006071 |
| Adjusted R-squared  | 0.969225 | S.D. dependent var | 0.026490 |
| S.E. of regression  | 0.004647 | Sum squared resid  | 0.003844 |
| F-statistic         | 542.1286 | Durbin-Watson stat | 2.015093 |
| Prob(F-statistic)   | 0.000000 |                    |          |

Source: E-Views Data Processing 10

Based on Table 10 shows the value of R Square ( $R^2$ ) is 0.971016 or which means that the variability of the dependent variable that the independent variable can explain is 97.10%. This shows that BOPO, CAR, LDR, NPL, SIZE and SBP Moderation simultaneously (together) affect the Bank's ROA by 97.10%. In comparison, the rest

(100% - 97.10% = 2.90%) is influenced by other variables outside this regression equation or variables that are not examined.

## CONCLUSION

The conclusions obtained from the results of research and discussion of the ratios of Commercial Banks listed on the IDX in 2016-2020 are as follows:

BOPO and SBP have a significant positive effect on ROA.

CAR, LDR and SIZE do not affect ROA.

NPL has a significant negative effect on ROA.

SBP moderates the effect of BOPO and NPL on ROA.

SBP does not moderate CAR, LDR and SIZE to ROA.

Moreover, Banks can use the BOPO and NPL determinants to measure the Bank's performance and use the SBP determinants that can moderate the BOPO and NPL in influencing the Bank's performance. For investors to focus more on the internal determinants of the Bank's BOPO and NPL and equipped with other information such as business risks, governance and sustainability information, including obtaining information from the Bank regarding the Bank's Business Plan. For Researchers is to do research repeatedly and continuously in order to obtain reliable determinants both as a basis for research during a pandemic crisis and during normal conditions, using BOPO and bank NPL because they have a significant influence on Bank performance and accommodate Guarantee Interest Rates (SBP) which is appropriate to be used as a moderator of the Bank's performance

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