

The Moderating Role BOPO of CAR, NPL, NIM and LDR on Banking Stock Returns on the Indonesian Stock Exchange

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Abstract

This research aims to determine and prove the partial and simultaneous influence of Capital Adequency Ratio (CAR), Non Performing Loans (NPL), Net Interest Margin (NIM), Loan to Deposit Ratio (LDR), Operating Costs Operating Income (BOPO) on Stock returns. The second objective is to prove whether BOPO moderates the relationship between Capital Adequency Ratio (CAR), Non Performing Loan (NPL), Net Interest Margin (NIM), Loan to Deposit Ratio (LDR) and Operating Costs and Operating Income (BOPO) on stock returns. This research uses an associative quantitative approach model, namely research to test the influence of the independent variable on the dependent variable. The population used in this research was 43 banks that were included and registered on the IDX for the 2018-2022 period. The sampling technique used uses the Purposive Sampling technique, namely that samples are taken based on certain criteria so that 20 banks are obtained with an observation period of 5 years so that 100 observation data are obtained. The data analysis technique uses Moderating regression where data analysis will use residual testing. Hypothesis testing uses the t test, F test and residual test. The results of this research prove that CAR, NIM, LDR partially have no effect on stock returns. The NPL and BOPO variables partially influence stock returns. Based on the simultaneous test, it can be concluded that the variables CAR, NPL, NIM, LDR and BOPO simultaneously have a significant effect on stock returns. The residual test results show that BOPO does not moderate the relationship between CAR, LDR, NIM and NPL on the Return variable.

Keywords: Capital Adequency Ratio, Non Performing Loan, Net Interest Margin, Loan to Deposit Ratio, Operating Costs and Operating Income

INTRODUCTION

The main activities of banks are accepting deposits, advances, cash, overdrafts and credit. Also, they provide loans to their customers at a certain interest rate. Moreover, they save money for customers in various and large bank accounts with single-digit interest loans and business support critical to growth. An important recent activity of the bank is providing financial assistance to clients that enables people to better organize their lives. With the advancement of technology and increasing competition, banks are providing various assistance to be current and attract clients. It is a good idea to recognize the various types of banking services that can be accessed (Arsew, Kisman, & Sawitri, 2020). This ensures you receive the best from recent banking activity (Climent, Momparler, & Carmona, 2019).

Banking institutions provide daily banking needs through providing credit in an effort to maximize bank income which is inseparable from financial risks. Risk according to Gambetti & Giusberti (2012) is the possibility of losing money in a business or investment

decision. Risks related to finance can result in capital losses for individuals and businesses. There are several financial risks, such as credit, liquidity and operational risks. Samuel (2015) further said that credit risk is defined as the possibility of financial loss due to the borrower's failure to repay the loan. Basically, credit risk refers to the risk that a lender will not be able to receive the principal and interest owed, resulting in cash flow disruptions and increased collection costs. Lenders can mitigate credit risk by analyzing factors regarding a borrower's creditworthiness, such as their debt load and current income.

Balancing risk and reward, providing agile scenario modeling, and helping Finance transform banking (Warner & Wäger, 2019). Demanding regulations, digital disruption and market uncertainty are significant drivers in managing bank performance in terms of profitability, solvency and liquidity. This financial analysis becomes a tool of truth between financial planning and regulatory forecasts in banking. Bank management will be able to allow "what-if" scenarios to be run and measure the impact of macroeconomic changes or unexpected events on scarce resources (Bernardin, 2016).

The main function of the Performance Management solution for Banking is to enable banks to achieve bank goals, namely collecting funds and channeling them into profits with low risk. Bank performance measurements include Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), Net Interest Margin (NIM), Loan to Deposit Ratio (LDR) and Operational Costs to Operating Income (BOPO). The first bank performance factor is the Capital Adequacy Ratio (CAR or capital adequacy ratio, which is a comparison between the availability of capital owned by a bank and its risk-weighted assets (Budianto & Dewi, 2023). This ratio provides a brief overview of whether a bank has sufficient funds to cover losses and remain able to pay debts in difficult financial circumstances. The capital-weighted assets to risk ratio, also known as the capital adequacy ratio, is one of the most important financial ratios used by investors and analysts. This ratio measures a bank's financial stability by measuring the capital it has available as a percentage of risk-weighted credit exposure (Ramlall, 2018).

Second, Non-Performing Loans (NPL) is a ratio that measures loans where the borrower has defaulted and has not made scheduled principal or interest payments for a certain period of time. In banking, a commercial loan is considered non-performing if the borrower is 90 days past due. Problematic Credit (Non Performing Loan) shows a condition where debtors, both individuals and business entities, are unable to pay their installments or debts to lenders on time. This condition can be caused by many things, such as the debtor losing his main income, not being present in a planned way to make payments, and so on (Susilawati & Nurulrahmatiah, 2021).

Third, Net Interest Margin (NIM) is a ratio that shows the amount of money the bank gets from loan interest compared to the amount of money the bank pays from deposit interest. NIM is an indicator of profitability and growth of a bank with an average NIM of 3%. Net interest margin is a profitability ratio that determines how a bank's interest income compares to what it pays to its customers. This formula requires three variables: investment returns, interest expense, and average productive assets. Expressed in percentage, NIM is a profitability indicator that estimates the possibility of a bank or investment company developing in the long term (Puspitasari, Sudiyatno, Hartoto, & Widati, 2021).

The fourth factor, namely Loan to Deposit Ratio (LDR), is a liquidity ratio that compares the amount of funds. Distributed to the community (credit) in the amount of community funds and own capital used. LDR reflects the ratio between financing provided by commercial banks to their financing. This ratio is a simple measurement tool used to assess bank liquidity by comparing total loans with total deposits in the same period. As everyone

knows, the response to the pandemic resulted in a surge in liquidity that reduced bank LDRs to levels unprecedented for almost half a century (Kacaribu & Crystallin, 2022).

The fifth factor, namely Operational Costs to Operating Income (BOPO), is a ratio that describes operational income calculated by subtracting operational costs from the company's gross profit. Operating costs are naturally recurring costs incurred to run a business such as administrative, sales or general costs (Galar, Sandborn, & Kumar, 2017). Operating income refers to a company's adjusted income after all operating expenses and depreciation are subtracted. Operational costs or operating expenses are simply costs incurred to keep the business running (Khamisah, Nani, & Ashsifa, 2020). After the author observes banking data listed on the Indonesian Stock Exchange, the following phenomena can be seen:

Table 1. Bank Performance Measurement

Tahun	CAR (%)	NPL (%)	LDR (%)	NIM (%)	BOPO (%)	Return. (%)
2018	22,97	4,6	94,78	5,14	77,86	3,05
2019	23,40	2,53	94,43	4,91	79,39	15,22
2020	23,89	3,06	82,54	4,45	86,58	-1,59
2021	25,66	3	77,49	4,63	83,55	014,53
2022	25,62	2,44	78,98	4,6	78,7	-6,33

Source: Data processed from OJK, 2022

Variable Data Development seen in the table above shows data fluctuations from 2018 to 2022. Stock return data fluctuated and experienced a decline in negative returns of -6.33% at the end of 2022. Thus, it is necessary to know the factors that influence stock returns. The factors that influence stock returns in this research are Capital Equity Ratio, Non-Performing Loans, Net Interest Margin and Loan to Deposit Ratio (Iskandar, Suharyanto, Zaki, & Widhayani, 2023).

Literature Review And Hypothesis Development

1. Agency Theory

Agency theory is an economic theory that views a company as a series of contracts between individuals who have their own interests. An agency relationship is created when one person (the principal) authorizes another person (the agent) to act on his or her behalf. According to Caers et al. (2006) explain that an agency relationship is a contract between the owner (principal) and the manager (agent) in carrying out a task in the interests of the owner by delegating decision-making authority to the manager.

2. Stock Return

Stock Return is the total income an investor obtains from their investment each year and is usually expressed as a percentage of the initial investment value. It is important to know that the return ratio is fixed and does not change if the number of shares owned by investors changes (Aguilar-Melchor et al., 2023). Stock Return is the total income an investor obtains from their investment each year and is usually expressed as a percentage of the initial investment value.

Usually investors gain profits on their investments in shares or investment portfolios when they obtain capital gains (Titman, Wei, & Xie, 2004). Capital gain is the amount of profit an investor makes when selling back their investment assets. In Indonesian, the meaning of capital gain is also called capital gain. Profit from capital gains is the difference between the selling price and the purchasing price of investment products (Thohiri, Yuni, Hastuti, & Arwansyah, 2020). Mathematically, stock returns can be calculated using the following formula:

$$\text{Capital gain (loss)} = \frac{\text{Stock Price}_{pt} - \text{Stock Price}_{pt-1}}{\text{Stock Price}_{pt-1}} \quad (\text{Saputri, 2018})$$

3. Capital Adequacy Ratio (CAR)

Capital Adequacy Ratio (CAR) is the ratio of bank capital to risk-weighted assets and current liabilities. This was decided by the central bank and bank regulators to prevent commercial banks from taking excess leverage and becoming bankrupt in the process (Syafrizal, Ilham, Muchtar, & Wardhiah, 2023). Capital Adequacy Ratio is a bank performance ratio to measure the adequacy of bank capital to cover the decline in its assets due to bank losses caused by risky assets and to support assets that contain or generate profits such as financing provided. Risk-weighted assets take into account credit risk, market risk and operational risk (Chen, Wang, Yang, Ng, & Cheng, 2022). However, CAR of 12%. Mathematically, the CAR ratio can be calculated using the following formula:

$$CAR = \frac{\text{Equity}}{\text{ASSETS WEIGHTED ACCORDING TO RISK}} \times 100\% \quad (\text{Azizah \& Manda, 2021})$$

4. Non Performing Loan (NPL)

Non Performing Loan (NPL) is a loan where the borrower experiences default and has not made scheduled principal or interest payments for a certain period of time. In banking, commercial loans are considered bad if the borrower is 90 days past due (Demiroglu & James, 2015). Furthermore, Sakti & Anisyukurlillah (2017) explained that Non Performing Loans (NPL) is a condition where debtors, both individuals and business entities, are unable to pay their installments or debts to lenders on time. This condition can be caused by many things, such as the debtor losing his main income, not being present in a planned way to make payments, and so on. Meanwhile, Ozili (2019) explains that NPL describes the ratio of a bank's non-performing loans to total gross credit as the value of non-performing loans (the gross value of credits recorded on the balance sheet) divided by the total value of the credit portfolio (including non-performing loans before deducting the allowance for credit losses). Khan, Siddique, & Sarwar (2020) emphasize that NPL implies that interest payments for ninety (90) days are capitalized, refinanced, or postponed due to changes in the loan agreement. Principal and interest payments are less than 90 days past due, and there is reason to doubt that the borrower will not pay the entire loan amount. Mathematically, the NPL ratio can be calculated using the following formula:

$$NPL = \frac{\text{TOTAL CREDIT PROBLEMS}}{\text{TOTAL CREDIT}} \times 100\% \quad (\text{Khamisah et al., 2020})$$

5. Net Interest Margin (NIM)

Net Interest Margin (NIM) shows the amount of money the bank earns from loan interest compared to the amount paid from deposit interest. NIM is an indicator of a bank's profitability and growth. The average NIM of banks is 3% in Q1 2023 (Angori, Aristei, & Gallo, 2019). Net Interest Margin (NIM) is a financial ratio used to determine the percentage of sales that a business retains as revenue after deducting expenses. For example, a profit margin of 20% indicates that a business earns \$0.20 from every dollar of sales it generates (Puspitasari et al., 2021). NIM shows the difference between interest income earned on interest-earning assets versus interest paid by banks or financial institutions. Net Interest Margin is a measure of the effectiveness of a financial institution's investment decisions. In the case of banks, if NPA increases, interest earned will fall and NIM will fall. In addition, if

demand for credit falls compared to demand for savings and deposit products, then NIM will fall. A high NIM increases bank profitability. NIM is a good indicator for the financial stability of a financial institution (Hao, Phung, & Pham, 2023). NIM is a profitability indicator expressed as a percentage, describing the possibility of a bank or investment company developing in the long term (Menicucci & Paolucci, 2016). Mathematically, the NIM ratio can be calculated using the following formula:

$$NIM = \frac{\text{Net Income}}{\text{RAverage Productive Assets}} \times 100\% \text{ (Puspitasari et al., 2021)}$$

6. Loan to Deposit Ratio (LDR)

Loan to Deposit Ratio (LDR) is a simple measurement used to assess bank liquidity by comparing total loans with total deposits in the same period. As everyone knows, the response to the pandemic resulted in a surge in liquidity that lowered bank LDRs to levels unprecedented for nearly half a century. Many institutions misinterpret their specific excess liquidity position as good liquidity management (Lins, Servaes, & Tufano, 2010). LDR measures the size of assets funded by public savings. He further stated, the Deposit to Asset Ratio tests whether banks that have more deposits incur additional operational costs to attract deposits. In the context of bank risk, the deposits to assets ratio measures the relative portion of total weighted assets funded by deposits and provides a precise analysis of the role of deposits as a funding source (Ofori-Sasu, Abor, & Mensah, 2019). Even though many institutions still have good levels of liquidity (for example LDR below 80%), the last three quarters have been a very torturous period for other institutions. Bank executives who thought they had a deep understanding of their retail or commercial client segments found they were ill-equipped to defend their most valuable source of funding. As a result, there are several examples of banks that experienced LDR changes of 15-25 percentage points over the last 12 months (Arsew et al., 2020). Mathematically, the LDR ratio can be calculated using the following formula:

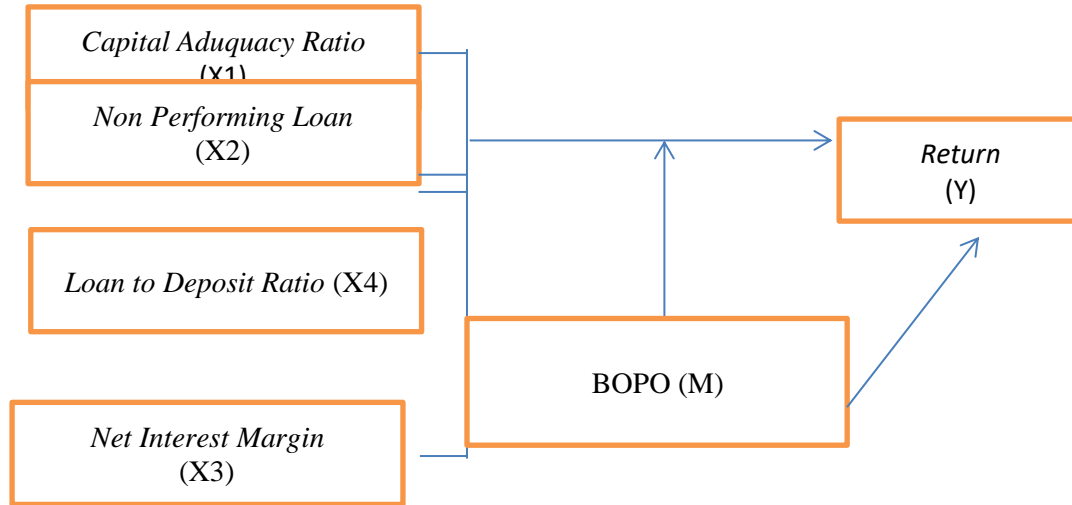
$$LDR = \frac{\text{THIRD PARTY CREDIT AMOUNT}}{\text{TOTAL THIRD PARTY FUNDS}} \times 100\% \text{ (Khatijah, Suryadi, \& Safitri, 2020)}$$

7. Operational Costs to Operational Income (BOPO)

Operating Costs to Operating Income (BOPO) is a ratio that describes operational income calculated by subtracting operational costs from the company's gross profit. Operating costs are naturally recurring costs incurred to run a business such as administrative, selling, or general costs. Operating income refers to a company's adjusted income after all operating expenses and depreciation are subtracted. Operational costs or operating expenses are simply costs incurred to keep the business running (Budianto & Dewi, 2023). BOPO is a ratio that shows the comparison between operational costs and operational income. The lower the BOPO ratio level, the more efficiently the company's resources are used, resulting in better bank management performance (S. T. Wahyudi, 2012). BOPO comes from Operating Revenue, which is the result obtained directly from the operational activities of a company as a result of the main business carried out by the company. Operating income is a measure that shows how much profit the company will make (Hanafia & Karim, 2020). Mathematically, the BOPO ratio can be calculated using the following formula:

$$BOPO = \frac{\text{OPERASIOANAL COST}}{\text{OPERASIONAL INCOME}} \times 100\% \text{ (Khamisah et al., 2020)}$$

8. Conceptual Framework and Hypothesis



Based on this theoretical framework, the researcher formulated research hypotheses as follows:

1. H1: The Capital Adequacy Ratio (CAR), reflecting the sufficiency of bank capital to absorb potential losses from risky assets and to support profit-generating assets like loans, is expected to positively and significantly impact stock returns of banking firms listed on the IDX, indicating that higher CARs correspond to higher stock returns (Srinivasan et al., 2009).
2. H2: Non-Performing Loans (NPL), indicating borrowers' inability to meet debt obligations promptly, are anticipated to have a negative and significant effect on share returns of IDX-listed banking companies, as higher NPL levels signal increased investor risk and potentially reduced stock returns (Bolognesi et al., 2020).
3. H3: The Net Interest Margin (NIM), representing the proportion of revenue after deducting costs, is hypothesized to positively and significantly influence share returns of IDX-listed banking firms, with higher NIMs indicating improved profit-generating capacity and potentially higher stock returns (Puspitasari et al., 2021).
4. H4: The Loan to Deposit Ratio (LDR), measuring the extent to which assets are funded by customer deposits, is expected to positively and significantly impact share returns of banking companies listed on the IDX, as a higher LDR signifies increased investment assurance and potentially higher stock returns (Acharya et al., 2013).
5. H5: The Operating Costs to Operating Income ratio (BOPO) is predicted to have a negative and significant effect on share returns of IDX-listed banking companies, with lower BOPO ratios indicating more efficient resource utilization and potentially higher stock returns (R. Wahyudi, 2020).
6. H6: Collectively, Capital Adequacy Ratio, Non-Performing Loans, Net Interest Margin, Loan to Deposit Ratio, and BOPO are expected to influence share returns of banking companies listed on the IDX.
7. H7: BOPO is expected to moderate the relationship between Capital Adequacy Ratio, Non-Performing Loans, Net Interest Margin, Loan to Deposit Ratio, and Share Returns of banking companies listed on the IDX.

METHOD

This research approach uses associative quantitative research, where the aim of the research is to prove the relationship and influence between two or more variables in a multiple linear regression model. Researchers conducted research on banking companies listed on the Indonesia Stock Exchange. Researchers collected data by accessing the site www.idx.co.id. The research period will start from March to May 2023.

Table 2. Operational Definition of Variables

No	Variable	Definition	Indicator	Scale
1	Stock Return	The total income an investor earns from their investment each year and is usually expressed as a percentage of the investment's initial value. Usually investors get a profit on their investment in shares or capital gains	$\frac{Pt - Pt - 1}{Pt - 1} \times 100\%$	Ratio
2	Capital Adequacy Ratio (CAR)	The ratio of bank capital to risk-weighted assets and current liabilities. This was decided by central banks and bank regulators to prevent commercial banks from taking on excess leverage and becoming insolvent in the process	$\frac{CAPITAL}{ATMR} \times 100\%$	Ratio
3	Non Performing Loan (NPL)	A ratio that shows the condition where debtors, both individuals and business entities, are unable to pay their installments or debts to lenders on time.	$\frac{CREDIT PROBLEMS}{TOTAL CREDIT} \times 100\%$	Ratio
4	Net Interest Margin (NIM)	A ratio that shows the amount of money the bank earns from loan interest compared to the amount paid from deposit interest	$\frac{Net\ interest\ income}{Average\ Productive\ Assets} \times 1$	Ratio
5	Loan to Deposit Ratio (LDR)	A ratio that measures the amount of assets funded by public savings. He further stated, the Deposit to Asset Ratio tests whether banks that have more deposits incur additional operational costs to attract deposits	$\frac{THIRD\ PARTY\ CREDIT}{THIRD - PARTY\ FUNDS} \times 100$	Ratio
6	Operational Costs to Operational Income (BOPO)	The ratio that describes operating income is calculated by subtracting operating expenses from the company's gross profit. Operating costs are naturally recurring costs incurred to run a business such as administrative, selling, or general costs.	$BOPO = \frac{Operating\ costs}{Operating\ Income}$	Ratio

This research uses secondary data, namely power that is available and ready for testing. Secondary data in this research is banking financial report data registered on the IDX. The data collection technique uses documentation techniques, namely data is collected by recapitulating report data and assessment results. The population used in this research was 43 banks listed on the BEI for the 2018 - 2022 period. The sampling technique used a side

purposive technique, namely the sample was selected based on sampling criteria, 20 banking companies were selected. The data analysis technique in this research uses moderating regression analysis (MRA). The moderating regression model in this research uses the dependent variable, namely stock returns, and the independent variables, namely CAR, LDR, NIM, NPL, BOPO with the following formulation:

$$Y_{it} = \alpha + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \beta_5 X_{5it} + \varepsilon$$

Information :

Y_{it} = dependent variable

X_{it} = independent variable

i = period

α = constant

β_{1-5} = coefecient

t = time series

ε = error term

RESULT AND CONCLUSSION

1. Descriptive statistics

The following shows general statistical data from all the data used, as seen in table 3 below:

Table 3. Descriptive Statistics of Research Variables

	N	Minimum	Maximum	Mean	Std. Deviation
CAR	100	68.23	84.50	17.57	9.56
NPL	100	4.49	4.92	4.72	0.13
NIM	100	.31	3.69	1.68	0.83
LDR	100	62.06	99.39	66.40	14.15
BOPO	100	76.39	88.57	80.96	3.49
RETURN	100	-2.44	4.53	0.59	1.12
Valid N (listwise)	100				

Source: Processed Data, 2024

The amount of N data is 100 data used from 20 banks registered on the IDX over a 5 year period (2018 – 2022). The average CAR is 17.57 with a standard deviation of 9.56, indicating that the CAR data distribution is relatively homogeneous and spreads between a maximum value of 84.50 and a minimum value of 68.23. The average NPL is 4.72 with a standard deviation of 0.13, indicating that the distribution of NPL data is relatively homogeneous and spreads between a maximum value of 4.92 and a minimum value of 4.49. The average NIM is 1.68 with a standard deviation of 0.83, indicating that the distribution of NIM data is relatively homogeneous and spreads between a maximum value of 3.69 and a minimum value of 0.31. The average LDR is 66.40 with a standard deviation of 14.15, indicating that the LDR data distribution is relatively homogeneous and spreads between a maximum value of 99.39 and a minimum value of 62.06. The average BOPO is 80.96 with a standard deviation of 3.49, indicating that the BOPO data distribution is relatively homogeneous and spreads between a maximum value of 88.57 and a minimum value of 76.39. The average return is 0.59 with a standard deviation of 1.12, indicating that the distribution of return data is relatively heterogeneous and spread quite far between the maximum value of 4.53 and the minimum value of -2.44.

2. Normalitas Test

Normality test before using the Kolmogorov-Smirnov (K-S) test, to determine the normality of the data with the naked eye we can see the histogram graph of the data which forms a normal curve or not from the PP Plots graph. Data will be normally distributed if the expected probability value is the same as the expected probability value and the observed probability is shown by a diagonal line which is the intersection of the expected probability line and the observed probability.

Table 4. Kolmogrove Smirnov test

		Unstandardized Residual
N		100
Normal Parameters ^a	Mean	.0000000
	Std. Deviation	1.03984268
Most Extreme Differences	Absolute	.209
	Positive	.209
	Negative	-.168
Kolmogorov-Smirnov Z		2.086
Asymp. Sig. (2-tailed)		.000
a. Test distribution is Normal.		

Source: Processed Data, 2024

Before the transformation was carried out, it turned out that only DER was normally distributed because sig > 0.05, while AKO, ROA and share prices were not normally distributed because the sig value was < 0.05, so data transformation had to be carried out.

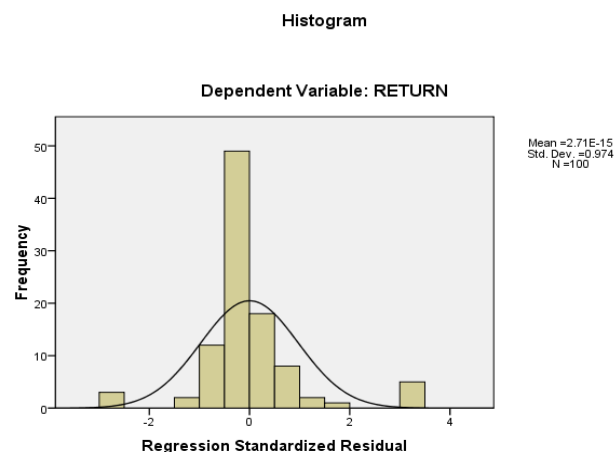


Figure 2. Histogram graph

Source: Processed Data, 2024

Judging from the picture, the data distribution is not normal because it is not proportional in the histogram graph.

Normal P-P Plot of Regression Standardized Residual

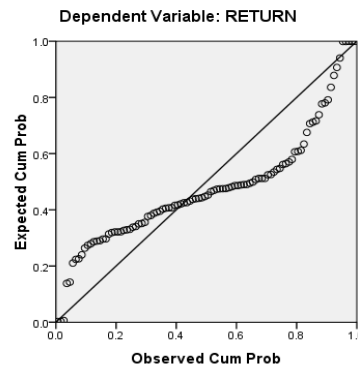


Figure 3. PP-Plots curve

Source: Processed Data, 2024

The curve shows that the data distribution spreads far from the diagonal and/or does not follow the direction of the diagonal line or the histogram graph does not show a normal distribution pattern, then the regression model does not meet the assumption of normality. The results of the normality test using the Kolmogorov-Smirnov (K-S) test after the data were transformed are as shown in Table 4 below:

Table 5. Kolmogrove Smirnov Test After Transformation

		Unstandardized Residual
N		94
Normal Parameters ^a	Mean	.0000000
	Std. Deviation	1.08742675
Most Extreme Differences	Absolute	.097
	Positive	.085
	Negative	-.097
Kolmogorov-Smirnov Z		.937
Asymp. Sig. (2-tailed)		.344

Source: Processed Data, 2024

After testing the normality of the data using the Kolmogrov Smirnov test, it turned out that all variables met a normal distribution because the sig value was $0.344 > 0.05$, so this model was suitable for use in multiple linear regression analysis. The number of observations was reduced from 100 to 94 because there was data that was not extreme so it was excluded from testing.

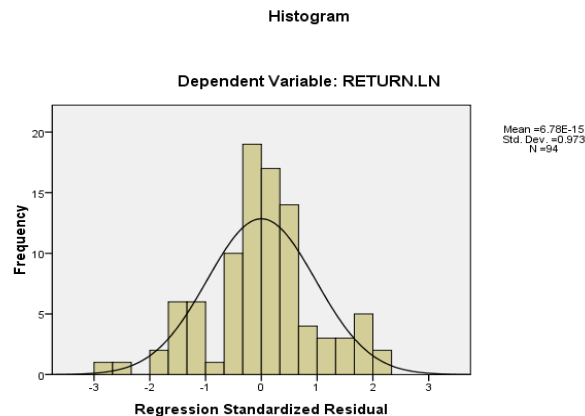


Figure 4. Transformation Histogram Graph

Source: Processed Data, 2024

Judging from the picture, the data distribution shows normal because it is proportional in the histogram graph.

Normal P-P Plot of Regression Standardized Residual

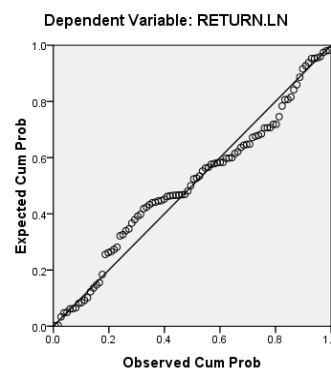


Figure 5. PP-Plots Transformation Curve

Source: Processed Data, 2024

The curve shows that the data distribution spreads close to the diagonal and follows the direction of the diagonal line or the histogram graph shows a normal distribution pattern, so the regression model meets the normality assumption.

3. Autocorrelation Test

The autocorrelation test aims to test whether in the linear regression model there is a correlation between confounding errors in period t and confounding errors in period $t-1$ (previously). If correlation occurs, it is called an autocorrelation problem. Autocorrelation arises because successive observations over time are related to each other. This problem arises because residuals (nuisance errors) are not independent from one observation to another. This is often found in time series data. Autocorrelation test results can be seen in table 6 below:

Table 6. Autocorrelation Test

Model	Durbin-Watson
1	2.140

Source: Processed Data, 2024

Based on Table 5, it shows that the Durbin-Watson value can be concluded that there is no positive autocorrelation or negative autocorrelation in the model used because the DW value is above 1 and below 5.

4. Multicollinearity Test

The results of the multicollinearity test can be seen in table 6 below:

Table 7. Multicollinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAR	.583	1.716
	NPL	.624	1.602
	NIM	.866	1.154
	LDR	.600	1.665
	BOPO	.656	1.525

Source: Processed Data, 2024

The results of calculating the tolerance value also show that there are no independent variables that have a tolerance value greater than 0.10, which means there is no correlation between the independent variables. The results of calculating the VIF value also show the same thing, there is not one independent variable that has a VIF value of more than 10, meaning there is no correlation between the independent variables.

5. Heteroscedasticity Test

The heteroscedasticity test aims to test for differences in residual variance from one observation period to another. Heteroscedasticity analysis uses a scatterplot graphic test. Heteroscedasticity can be done by observing certain patterns on the scatterplot graph, where if there are points that spread above and below the number 0 on the Y axis and do not form a pattern then heteroscedasticity does not occur. The scatterplot graph can be seen in the following image:

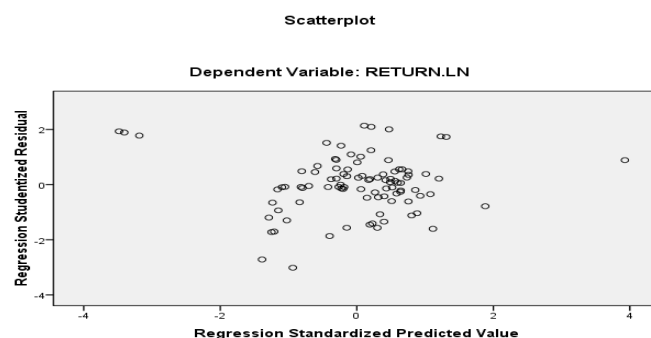


Figure 5. Heteroscedasticity test

Source: Processed Data, 2024

From the scatterplot image above, it can be seen that the dots are spread randomly and do not form a particular or irregular pattern. This indicates that heteroscedasticity does not occur in the regression model so that the regression model is suitable for use.

6. Multiple Linear Regression

Proving the partial (individual) influence of CAR, NPL, NIM, LDR and BOPO on stock returns can be done using the t statistical test. Based on the results of data processing with the SPSS 22 program, the results obtained are as shown in Table 8 below:

Table 8. Partial Test

Model		Unstandardized Coefficients		t	Sig.
		B	Std. Error		
1	(Constant)	25.013	7.982	3.134	.002
	CAR	.010	.015	.656	.513
	NPL	-2.819	1.162	-2.425	.017
	NIM	-.030	.150	-.203	.840
	LDR	-.006	.011	-.612	.542

Source: Processed Data, 2024

Based on the variables above, CAR has a significance figure of 0.513, which is greater than 0.05, which shows that partial CAR has no significant effect on stock returns. NPL has a significance figure of 0.017, which is smaller than 0.05, which shows that NPL partially has a significant effect on stock returns. NIM has a significance figure of 0.840, greater than 0.05, which shows that NIM partially has no significant effect on stock returns. LDR has a significance figure of 0.542 which is greater than 0.05 which shows that LDR partially does not have a significant effect on stock returns.

Based on table 8 of the t test, the values:

$$a = 25,013$$

$$\beta_1 = 0.010$$

$$\beta_2 = -2.819$$

$$\beta_3 = -0.030$$

$$\beta_4 = -0.006$$

So the multiple linear regression equation for the five predictors is:

$$Y = 25,014 + 0,010CAR - 2,819NPL - 0,030 NIM - 0,006LDR$$

Based on the regression equation above, the CAR variable has a positive influence on returns of 0.010, meaning that every time the CAR variable increases by 1, stock returns will increase by 0.010 assuming the other variables are constant, and the effect of AKO on stock prices is not significant. The NPL variable has a negative influence on returns of -2.819, meaning that every time the NPL variable increases by 1, stock returns will decrease by 2.819 assuming the other variables remain constant, and the influence of NPL on share prices is significant. The NIM variable has a negative influence on returns of -0.030, meaning that every time the NIM variable increases by 1, stock returns will decrease by 0.030 assuming the other variables remain constant, and the influence of NIM on share prices is not significant. The LDR variable has a negative influence on returns of -0.006, meaning that every time the LDR variable increases by 1, stock returns will decrease by -0.006 assuming the other variables remain constant, and the influence of LDR on stock prices is not significant. The BOPO variable has a negative influence on returns of -0.153, meaning that every time the BOPO variable increases by 1, stock returns will decrease by

0.153 assuming the other variables remain constant, and the effect of BOPO on stock prices is significant.

7. Simultaneous Test

Proving the influence of CAR, NPL, NIM, LDR and BOPO simultaneously (together) on stock returns can be done using the F statistical test. Based on the results of data processing with the SPSS version 22 program, the results obtained are as shown in table 9 below. :

Table 9. Simultaneous Test

Model		F	Sig.
1	Regression	3.281	.009 ^a

Source: Processed Data, 2024

Based on the ANOVA test or F-test, the calculated F is 3.281 which is greater than the F-Table of 2.946 with a significance level of 0.040 which is smaller than 0.05, meaning that H_a is accepted and H_0 is rejected. Based on these results, it can be concluded that the variables CAR, NPL, NIM, LDR and BOPO simultaneously have a significant effect on stock returns.

8. Coefficient of Determination

Based on the results of data processing with SPSS version 22, the coefficient of determination results were obtained as shown in table 10 below:

Table 10 R-Square

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.396 ^a	.157	.109	1.11789

Source: Processed Data, 2024

The R-Square figure for the coefficient of determination is 0.157. This means that 15.7% of the variation or change in stock returns can be explained by the variance in CAR, NPL, NIM, LDR and BOPO. Meanwhile, the remaining 84.3% is explained by other variables not studied. This second model test was carried out to test the moderating variable used in the research, namely whether BOPO can moderate the relationship between the CAR, NPL, NIM and LDR variables and the dependent variable (share returns). The condition for testing the moderating hypothesis is that the calculated t value must be negative for the absolute residual value with a significance of <0.05 . The results of the residual test equation in this study can be seen in Table 11.

Table 11. Moderating Regression Analysis

Model		T	Sig.
1	(Constant)	-4.767	.000
	Moderating	-.735	.464

Source: Processed Data, 2024

The residual test results show that the regression coefficient is negative (-0.735) and significant $0.464 > 0.05$, so it can be concluded that the influence of the CAR, LDR, NIM and NPL variables on the Return variable cannot be moderated by the BOPO variable. Or in other words, it can be concluded that BOPO does not moderate the relationship between CAR, LDR, NIM and NPL on the Return variable.

Discussion

The results of this research are able to prove that CAR has no effect on banking stock returns. Because the CAR variable has a significance of $0.513 > 0.05$, H_a is rejected and H_0 is accepted, so the CAR ratio has no significant effect on stock returns. The results of this research do not support the results of previous research by Harjoto, Rossi, & Paglia (2021) which said that CAR has an effect on stock returns. Meanwhile, the results of our research are consistent or support the results of research by Pal & Mitra (2019) which said that CAR has no effect on stock returns. The implication according to the results of this research is that CAR has no effect on stock returns because investors are less interested in assessing banking CAR so it has no impact on the assessed stock returns.

The results of this research are able to prove that LDR has no effect on banking ROA. The LDR variable has a significance value of $0.542 > 0.05$, so H_a is rejected and H_0 is accepted, so the LDR ratio has no significant effect on stock returns. The results of this research are not consistent with the results of previous research by Rizkia (2023) who said that LDR influences stock returns. Our research results consistently support the research results of Sunaryo, Adiyanto, & Sa'diyah (2022) which say that LDR has no effect on stock returns. The implication of the results of this research is that LDR has no effect on stock returns because from the data that has been collected and researched, it is clear that LDR has no effect on stock returns.

The results of this research are able to prove that NIM has no effect on banking stock returns. The NIM variable has a significance value of $0.840 > 0.05$, so H_0 is accepted and H_a is rejected, so the NIM ratio has no significant effect on stock returns. The results of this research do not support the results of previous research by Subagyo, Achسانی, & Sasongko (2022) which said that NIM influences stock returns. Our research results consistently support the research results of Lestari, Wahyuni, & Affandi (2022) which say that NIM has no effect on returns. The implication according to the results of this research is that NIM has no effect on stock returns because from the data that has been collected and researched, it is clear that NIM has no effect on stock returns.

The results of this research are able to prove that BOPO has an effect on banking stock returns. The BOPO variable has a significance of $0.000 < 0.05$, so H_0 is rejected and H_a is accepted, so the BOPO ratio has a significant effect on ROA. The results of this research support the results of previous research by Wiadnyani & Artini (2023) which said that BOPO has an effect on stock returns. The results of this research also consistently support the results of research by Winoto & Purba (2022) who said that BOPO has an effect on stock returns. The implication according to the results of this research is that BOPO has an effect on stock returns because from the data that has been collected and researched, it is clear that BOPO has an effect on stock returns.

CONCLUSION

This research can conclude that CAR has a significance figure of 0.513 which is greater than 0.05, which shows that CAR partially has no effect on stock returns. NPL has a significance figure of 0.017, which is smaller than 0.05, which shows that NPL partially influences stock returns. NIM has a significance figure of 0.840, greater than 0.05, which shows that NIM partially has no effect on stock returns. LDR has a significance figure of 0.542 which is greater than 0.05 which shows that LDR partially has no effect on stock returns. Based on the ANOVA test or F-test, the calculated F is 3.327 which is greater than the F-Table of 2.946 with a significance level of 0.040 which is smaller than 0.05, meaning that H_a is accepted and H_0 is rejected. Based on these results, it can be concluded that the

variables CAR, NPL, NIM, LDR and BOPO simultaneously have a significant effect on stock returns. The residual test results show that the regression coefficient is negative (-0.735) and significant $0.464 > 0.05$, so it can be concluded that the influence of the CAR, LDR, NIM and NPL variables on the Return variable cannot be moderated by the BOPO variable. Or in other words, it can be concluded that BOPO does not moderate the relationship between CAR, LDR, NIM and NPL on the Return variable.

The implications of the results of this research are able to explain that banking stock returns on the IDX are only influenced by NPL, while CAR, NIM and LDR do not affect stock returns. This is caused by investors' preference for assessing NPL which is a benchmark for financial risk. The author advises investors when investing to value NPL more because it has been proven to have an effect on stock returns. For banks, it is hoped that they can further increase company profits so that they can influence stock returns. Further researchers are advised to add other variables such as asset structure, dividends, debt policy and others.

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