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Fundamental Factors of Bank Performance, Profitability: Net Interest Margin as a Mediating

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ABSTRACT

This study aims to analyze the influence of fundamental bank performance factors, as proxied by CAR, NPL, and LDR, on profitability, as proxied by ROA, with NIM as a mediating variable. The objects of this study include banks listed on the Indonesia Stock Exchange (IDX) for the 2020-2024 period. This study uses a quantitative approach with a panel data regression method processed using Eviews 13 through the Random Effect Model (REM). This test is carried out through model selection tests, classical assumption tests, t-tests, f-tests, R-Square tests, and Sobel tests. The results of this study indicate that CAR and NPL do not significantly affect NIM. While LDR significantly affects NIM. On the other hand, CAR and LDR do not significantly affect ROA, but NPL and NIM significantly affect ROA. In addition, NIM is unable to mediate the relationship between fundamental bank performance factors, namely CAR, NPL, and LDR, with profitability.

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1. INTRODUCTION

The banking sector in Indonesia plays a crucial role in building the economic and financing system, serving as a financial intermediary (Noor & Suhendra, 2024). Banks are considered a safe haven for the public to store their money Annisa et al. (2022). Bank stability and performance are key determinants of the resilience of the national financial system, given their strategic role in supporting economic growth and maintaining public trust. Banking performance is generally measured through profitability indicators, one of which is return on assets (ROA), which reflects management's ability to effectively manage assets to generate profits. Return on Assets (ROA) is a profitability ratio used to measure a company's ability to utilize all funds invested in operational activities with the aim of generating profits by utilizing its assets. ROA not only reflects operational efficiency but also demonstrates the bank's success in simultaneously performing its intermediation and risk management functions. To maintain or increase ROA, attention is needed to several factors that fulfill ROA, including the Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Non-Performing Loan (NPL), and Net Interest Margin (NIM), which are ratios that serve as benchmarks in presenting an overview of a bank's ability to generate net interest by managing its productive assets (Noor & Suhendra, 2024).

Lending to the public or customers is a primary source of income for banks. While lending to the public or customers carries risks for the banking sector, it is also a source of income for a bank (Tresnawaty, 2022). Bank performance, or the bank's ability to increase its business value, is measured through increased profits, assets, and future prospects. However, the evaluation remains focused on profitability and risk. Risk can be proxied by credit risk, liquidity risk, interest risk, and operational risk capital (Purwoko & Sudiyatno, 2013).

Table 1. Average Financial Ratios in Banks 2020-2024

Financial Ratios	Year				
	2020	2021	2022	2023	2024
CAR	35.36%	35.41%	35.38%	35.36%	35.30%
NPL	2.59%	2.57%	2.55%	2.54%	2.53%
LDR	91.46%	91.44%	91.46%	91.49%	91.56%
NIM	4.93%	4.91%	4.89%	4.87%	4.85%
ROA	1.32%	1.37%	1.41%	1.45%	1.48%

Source: Processed Secondary Data (2026)

Based on Table 1. The average financial ratios indicate a contradictory dynamic between the intermediation function and profitability levels, where the LDR experienced a significant escalation to reach its highest point of 91.56% in 2024, this was followed by a contraction in NIM to 4.85% and ROA to 1.48%, although asset quality showed a consistent improvement trend through a continuous decrease in NPL from 2.59% to 2.53%, and supported by a very adequate CAR with a ratio above 35%. The decline in profitability amidst aggressive credit expansion indicates ineffectiveness in optimizing net interest margins.

On the other hand, the intermediation function, as reflected in the Loan-to-Deposit Ratio (LDR), indicates that credit distribution growth often coincides with the economic recovery process. This increased intermediation has the potential to drive profit growth through increased interest income. However, credit expansion without prudential risk management can increase the Non-Performing Loan (NPL) ratio, which ultimately puts pressure on the net

interest margin and profitability. Thus, there is an interrelated relationship between capital adequacy, credit risk, liquidity, and the bank's ability to generate net interest margin and profit, as reflected in ROA. This condition indicates a trade-off between efforts to increase intermediation to boost profitability and the need to maintain risk stability and bank health.

Previous empirical research has shown inconsistent findings, with the relationship between variables varying depending on the period and bank type (Pradigdo et al., 2025). Anindiansyah et al. (2020) found that CAR and LDR significantly influenced ROA, with NIM as an intervening variable. Conversely, they showed that although NIM influenced ROA, it was unable to significantly mediate the relationship between NPL and LDR on ROA. Previous research also found that NPL, LDR, and CAR significantly influenced ROA, and NIM was shown to mediate the influence of NPL, LDR, and CAR on ROA (Salsabila et al., 2024). Other studies have also shown inconsistent findings, where CAR influenced ROA (Putri & Bella, 2025), while CAR did not (Hakim & Syatoto, 2024) and (Silpiani & Kusumawardani, 2025). Other studies have found that NPL affects ROA (Bhaktiar & Fatoni, 2024), while LDR has no effect on ROA (Yeni et al., 2024), and (Assegaff et al., 2026). Previous studies Admadja et al. (2023) and Kustiawati & Abdurrohman (2025) also found that CAR, LDR, and NPL affect ROA. These discrepancies indicate empirical inconsistencies regarding the mediating mechanism of NIM in bridging the influence of risk and liquidity on profitability. Furthermore, some previous studies were conducted before the heightened global uncertainty post-pandemic, thus not fully reflecting the dynamics of banking risk in the current period. Thus, there remains a research gap that requires further examination, particularly in the context of banks listed on the Indonesia Stock Exchange during the 2020-2024 period.

Based on the phenomenon of increasing credit risk pressure and the dynamics of the intermediation function, as well as the inconsistency of previous research results, this study formulates the questions whether the Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), and Loan to Deposit Ratio (LDR) affect Return on Assets (ROA), whether these three variables affect Net Interest Margin (NIM), and whether Net Interest Margin (NIM) is able to mediate the effect of CAR, NPL, and LDR on ROA in banks listed on the Indonesia Stock Exchange for the 2020-2024 period. In line with this formulation, the urgency of this study lies in testing the extent to which these fundamental factors affect financial performance, by placing NIM as a mediating variable to explain the transmission mechanism between CAR, NPL, and LDR on bank profitability in Indonesia. This research is expected to contribute to the development of banking finance literature and serve as a reference for management and regulators in formulating policies that support sustainable banking stability and performance.

The novelty of this study lies in the integrity of the full economic cycle analysis, encompassing the crisis, recovery, and monetary policy normalization period at the end of 2024. Unlike previous studies that focused solely on the peak period of the pandemic with a direct linear relationship, this study utilizes Net Interest Margin (NIM) as a mediating variable. The use of NIM as a link aims to analyze the ongoing NIM compression phenomenon and empirically demonstrate whether CAR, NPL, and LDR can truly be converted into profit amidst narrowing interest margins. By limiting the research focus to banks listed on the Indonesia Stock Exchange in 2020-2024, this study provides a new theoretical contribution to the banking finance literature regarding the defense mechanisms of systematic banking profitability in the face of monetary volatility in the post-pandemic era. These results indicate that liquidity and credit quality are important factors that contribute to bank financial performance. Overall, this study offers a new perspective in the Indonesian banking context,

demonstrating that the presence of mediating variables such as NIM is becoming more important in measuring return on assets, particularly in the banking sector. This also contributes to enriching studies on the relationship between financial ratios and banking profitability, especially in facing the dynamics of continuously developing economic conditions.

Theoretical Review

This study uses the Signaling Theory perspective, which explains that a company's financial risk serves as an information signal to external parties regarding the company's performance. In the banking context, CAR, NPL, and LDR reflect bank health signals that influence Net Interest Margin and Profitability, which are proxied by ROA. According to Simorangkir (2019), signaling theory discusses how signals of success or failure of management (agent) should be conveyed to owners (principals). Signaling theory explains that signaling is carried out by management to reduce asymmetric information.

The dependent variable in this study is Return on Assets (ROA), which is used as a proxy for bank profitability and is measured by the comparison of profit before tax to total assets. The independent variables consist of Capital Adequacy Ratio (CAR), Non-Performing Loan (NPL), and Loan to Deposit Ratio (LDR). CAR is measured as the ratio of capital to risk-weighted assets, reflecting the bank's capital adequacy level. NPL is measured as the ratio of non-performing loans to total loans granted, which illustrates the level of credit risk. LDR is measured as the ratio of total credit to third-party funds, which reflects the bank's ability to carry out its intermediation and liquidity management functions. The mediating variable in this study is Net Interest Margin (NIM), which is measured as the ratio of net interest income to total earning assets, which reflects the bank's ability to generate net interest margin from intermediation activities.

Table 2. Variable Operational Definition

Variable	Definition	Measurement
Capital Adequacy Ratio (CAR)	The Capital Adequacy Ratio (CAR) is a ratio used to measure the adequacy of a bank's capital to support risk-bearing assets. The higher the CAR, the better the bank's capital quality.	$CAR = \frac{Capital}{Risk - Weighted Asset (RWA)} \times 100\%$
Non-Performing Loan (NPL)	According to Rahagi et al. (2023), non-performing loans are one way to assess a bank's asset quality. Non-performing loans are also a risk arising from the increasing complexity of banking	$NPL = \frac{Non\ Performing\ Loan}{Total\ Loans} \times 100\%$

	activities. The larger the bank's operational scale, the less oversight of operational activities, which will result in higher NPLs.	
Loan to Deposit Ratio (LDR)	According to Salsabila et al. (2024), the LDR reflects the relationship between the amount of loans granted by a bank and the amount of funds received from customers. A high LDR may indicate potential liquidity risk due to reliance on loans. Conversely, a low LDR may indicate suboptimal asset management and a lack of profitable lending activity.	$LDR = \frac{Total\ Credit\ Provided}{Third\ Party\ Funds} \times 100\%$
Return on Assets (ROA)	Return on Assets (ROA) is the ratio of after-tax profit to total assets. The higher the ROA, the better the banking company's performance, as the company receives greater returns.	$ROA = \frac{Profit\ After\ Tax}{Total\ Assets} \times 100\%$
Net Interest Margin (NIM))	According to Astuti & Badjuri (2023), the NIM ratio is used to measure a bank's management of productive assets to generate net interest income. The higher the NIM ratio, the better the bank's management of its credit resources. Consequently, the	$NIM = \frac{Net\ Interest\ Income}{Earning\ Assets} \times 100\%$

bank's financial performance is likely to be poor and its financial execution will be better.

The effect of CAR on NIM

A high CAR ratio indicates a bank has a healthy capital structure. Strong capital allows banks to take advantage of opportunities to invest in productive assets that carry higher risks but provide high yields, potentially increasing their net interest margin (NIM). According to Noor & Suhendra (2024), CAR will be a measure of bank management's success in achieving high profits. The higher the bank's capital adequacy, the higher the resulting NIM. Therefore, the first hypothesis in this study is formulated as follows:

H1: Capital Adequacy Ratio (CAR) has a significant effect on Net Interest Margin (NIM)

The effect of NPL on NIM

The NPL ratio reflects non-performing loans. The higher the NPL, the greater the uncollected interest income. Furthermore, banks must establish allowances for possible losses, which weigh on net interest income. Therefore, a high NPL will theoretically lower the NIM. Therefore, the second hypothesis in this study is formulated as follows:

H2: Non-Performing Loan (NPL) has a significant effect on Net Interest Margin (NIM)

The effect of LDR on NIM

The LDR ratio reflects the extent to which third-party funds are channeled into loans. In general, an increase in the LDR will increase interest income. However, if the LDR is too high, banks may increase deposit rates to attract funds, which can suppress the NIM due to inflated cost of funds. Therefore, the third hypothesis in this study is formulated as follows:

H3: Loan to Deposit Ratio (LDR) has a significant effect on Net Interest Margin (NIM)

The effect of CAR on ROA

Based on signaling theory, high capital provides a positive signal to the market that the bank is in a secure position, thereby increasing customer trust and operational efficiency, which leads to increased ROA. Therefore, the fourth hypothesis in this study is formulated as follows:

H4: Capital Adequacy Ratio (CAR) has a significant effect on Return on Assets (ROA)

The effect of NPL on ROA

Non-performing loans are a factor that impacts profitability. High NPLs require banks to allocate significant provisioning costs, which directly reduces net income (ROA). Therefore, the fifth hypothesis in this study is formulated as follows:

H5: Non-Performing Loans (NPL) have a significant effect on Return on Assets (ROA)

The effect of LDR on ROA

The more credit disbursed, the greater the bank's opportunity to earn profits from credit interest, which can directly increase ROA. Therefore, the sixth hypothesis in this study is formulated as follows:

H6: Loan to Deposit Ratio (LDR) has a significant effect on Return on Assets (ROA)

The effect of NIM on ROA

NIM is a key factor in bank revenue. The wider the net interest margin, the greater its contribution to the company's net profit. Therefore, the seventh hypothesis in this study is formulated as follows:

H7: Net Interest Margin (NIM) has a significant effect on Return on Assets (ROA)

The effect of CAR on ROA through NIM

A high CAR enables banks to obtain funds and channel them into productive assets that generate net interest income (NIM), which is then reflected in ROA. Strong capital and a high NIM increase bank profitability (Purbadasuha & Prasetyo, 2024). Therefore, the eighth hypothesis in this study is formulated as follows:

H8: Capital Adequacy Ratio (CAR) has a significant effect on Return on Assets (ROA) through Net Interest Margin (NIM).

The effect of NPL on ROA through NIM

High NPLs can indicate poor earning asset quality, impacting cash flow from interest income. Declining interest income leads to a decline in NIM, limiting the bank's ability to generate net profit. So the ninth hypothesis in this study is formulated as follows:

H9: Non-Performing Loans (NPL) have a significant effect on Return on Assets (ROA) through Net Interest Margin (NIM).

The effect of LDR on ROA through NIM

An increase in the LDR means the bank's productive assets are working harder. The more credit disbursed, the greater the bank's potential to earn interest income, thereby increasing its Net Interest Margin (NIM). An optimal NIM can contribute to ROA. So the tenth hypothesis in this study is formulated as follows:

H10: Loan to Deposit Ratio (LDR) has a significant effect on Return on Assets (ROA) through Net Interest Margin (NIM).

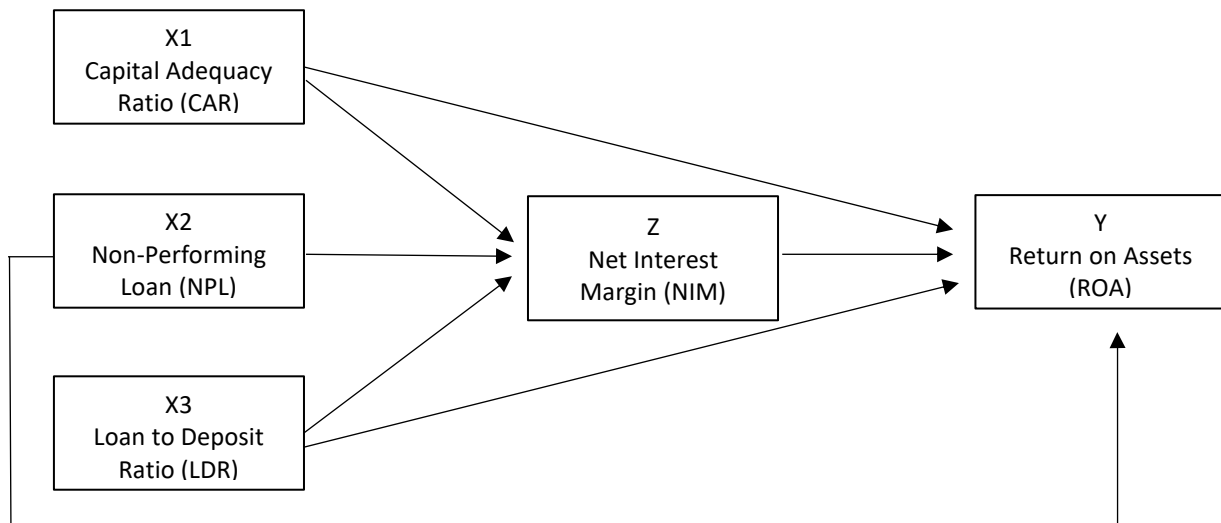


Figure 1. Research Model

2. METHODOLOGY

This study uses a quantitative approach, namely data in numerical form that has been calculated through a scoring process. This approach can be processed using statistical calculation techniques. The data used in this study is secondary data sourced from the financial statements and annual reports of banks listed on the Indonesia Stock Exchange (IDX) as well as relevant official company publications for the period 2020-2024. Data collection techniques were carried out through documentation and literature studies, namely data obtained by directly collecting and recording (Susilawati & Nurulrahmatiah, 2021).

The population in this study was all banks listed on the Indonesia Stock Exchange during the observation period, with a total of 47 banks. The sampling technique in this study used a purposive sampling method with certain criteria. The criteria used were banks with complete financial ratios and banks that experienced profits during the study period. Based on these criteria, 30 banks were obtained as research samples. However, in this study, outlier data filtering was carried out to ensure the data was normally distributed, thereby increasing the reliability and validity of the statistical model used to test the research hypotheses. Thus, the final sample size was 25 banks. The data used in this study is panel data that combines cross-sectional and time series dimensions, allowing for a more comprehensive analysis of the dynamics of variables during the study period.

The data analysis technique used was panel data regression analysis with the Random Effect Model (REM) approach, which was selected based on the results of model selection tests using the Chow test, the Hausman test, and the Lagrange multiplier test. The analysis was conducted in two stages to examine the mediating role: the first stage examined the effect of CAR, NPL, and LDR on NIM, and the second stage examined the effect of CAR, NPL, LDR, and NIM on ROA. All data processing was performed using Eviews 13 software.

3. RESULTS AND DISCUSSION

This study aims to analyze the effect of the Capital Adequacy Ratio (CAR), Non-Performing Loans (NPL), and the Loan to Deposit Ratio (LDR) on bank profitability, proxied by Return on Assets (ROA), with Net Interest Margin (NIM) as a mediating variable for banks listed on the Indonesia Stock Exchange (IDX) in 2020-2024. This analysis was conducted using panel data regression with a Random Effects Model (REM) approach, selected based on the results of the model selection test.

Table 3. Descriptive Statistics Results

	N	Mean	Median	Maximum	Minimum	Std. Dev.
CAR	125	26.95736	25.23000	53.98000	10,500,000	8.842706
NPL	125	2.610800	2,750,000	7.990000	0.210000	1.219165
LDR	125	83.78272	82.70000	162.2900	29.67000	25.31752
ROA	125	1.225680	1.090000	3.780000	0.010000	0.887112
NIM	125	4.712240	4.690000	7,700,000	0.470000	1.373868

Source: Processed Secondary Data (2026)

Based on the results of descriptive statistical testing on 125 research samples, CAR showed a mean value of 26.96 with a standard deviation of 8.84. The minimum value was recorded at 10.50 and the maximum reached 53.98, indicating that banks generally have a capital adequacy level far above regulatory requirements, although there is quite wide variation between companies. Meanwhile, the NPL variable had a mean value of 2.61 with a maximum value of 7.99 and a minimum of 0.21. The mean NPL value below 5% indicates that banks were collectively able to maintain their asset quality well during the study period. The LDR variable had a mean value of 83.78 with a fairly fluctuating data distribution, which is evident from the standard deviation reaching 25.32. This also indicates the diversity of credit distribution strategies among banks, where the maximum value reached 162.29 and the minimum 29.67. On the other hand, ROA had a mean of 1.23 with a standard deviation of 0.89. Meanwhile, the mean NIM was 4.71 with a standard deviation of 1.37. The standard deviations of ROA and NIM were relatively smaller than the mean, indicating that the data tended to cluster around the mean and indicated stability in interest income and net profit performance at the banks studied during the 2020-2024 period.

Normality Test

The normality test is carried out with the aim of assessing whether the data distribution is normally distributed or not (Anindiansyah et al., 2020). The normality test obtained a probability of 0.535789 for the first stage and 0.111049 for the second stage, where the probability value is > 0.05. Therefore, it can be said that the data is normally distributed.

Classical Assumption Test

Table 4. Autocorrelation Test

	Durbin-Watson stat
CAR, NPL, LDR → NIM	1.313059
CAR, NPL, LDR, NIM → ROA	0.984574

Source: Processed Secondary Data (2026)

From table 3. it can be seen that the test results show Durbin-Watson values of 1.313059 and 0.984574. Where, if the DW number is between -2 and +2, there is no autocorrelation (Mudawanah, 2019).

Table 5. Multicollinearity Test

	CAR	NPL	LDR	NIM
CAR	1	-0.085369	0.129244	0.258433
NPL	-0.085369	1	-0.228642	-0.177043
LDR	0.129244	-0.228642	1	0.181031
NIM	0.258433	-0.177043	0.181031	1

Source: Processed Secondary Data (2026)

Table 5. shows that the independent variables have a correlation value < 0.80 . Therefore, it can be concluded that the regression model passes the multicollinearity test.

Table 6. Heteroscedasticity test stage 1

	Prob.
CAR	0.8314
NPL	0.4549
LDR	0.8658

Source: Processed Secondary Data (2026)

Table 7. Heteroscedasticity Test Stage 2

Heteroskedasticity Test: Harvey			
F-statistic	2.070555	Prob. F (4,120)	0.0889
Obs*R-squared	8.070313	Chi-Square Prob. (4)	0.0890
Scaled explained SS	7.127911	Chi-Square Prob. (4)	0.1293

Source: Processed Secondary Data (2026)

Heteroscedasticity tests were conducted in stages 1 and 2 of the study. Table 6. shows that the research model is free from heteroscedasticity symptoms using the original data. However, in stage 2, indications of non-constant residual variance were found. To address this issue, a Harvey test was conducted by applying a logarithmic transformation to the research variables. The required result of this test for the dependent variable is the Chi-square probability value in the Obs*R-Squared section (Rangkuti et al., 2021). Thus, the estimation after transformation shows an increase in the Obs*R-Squared probability value to above the 0.05 significance level, namely 0.0890. Thus, both models in this study meet the homoscedasticity assumption, so that the resulting regression coefficients are efficient and unbiased.

Panel Data Regression Model Analysis

Panel data regression model analysis was used to examine the relationship between independent variables and dependent variables, combining cross-section and time series

data. Model selection was performed using the Chow and Hausman tests, resulting in a Random Effects Model for this study. The feasibility of the regression model was assessed using the coefficient of determination (R-Square and Adjusted R-Square).

Table 8. F Test Results

Variables	R-Square	Adjusted R-square	SE of Regression	F-statistic	Prob (F-statistic)
NIM (Z)	0.072431	0.049433	0.413276	3.149505	0.027549
ROA (Y)	0.228135	0.202406	0.363469	8.866888	0.000003

Source: Processed Secondary Data (2026)

According to Setiawati (2020) The F test is used to test the relationship simultaneously which aims to determine whether all independent variables together have a significant influence on the dependent variable. The test is carried out by comparing the calculated F- and F-table at a significance level of 5%. Where from the results of the F test, this study produces an F-Statistic of 3.149 with a probability value (F-Significant) of 0.027249 which is smaller than 0.05 which explains that simultaneously CAR, NPL, and LDR affect NIM. Also produced is an F-statistic of 8.866888 with a Prob (F-Statistic) of 0.000003 smaller than 0.05 which explains that simultaneously CAR, NPL, LDR, and NIM also affect ROA.

According to Purbadasuha & Prasetyo (2024) the coefficient of determination test is used to assess the extent to which independent variables can explain variations in the dependent variable. The test results in this study indicate that the Adjusted R Square value for NIM (Z) is 0.04 or 4%, which indicates that CAR, NPL, and LDR are able to explain 4% of the NIM variable, the remaining 96% is explained by other variables. And for the coefficient test results also show that the Adjusted R Square value is 0.20 or 20% which indicates that the CAR, NPL, LDR and NIM variables are able to explain 20% of the ROA variable, the remaining 80% is explained by other variables not included in the study.

Hypothesis Testing

Hypothesis testing was conducted using panel data regression with a Random Effects Model (REM) approach. The t-test was used to examine the partial influence of each variable. According to Setiawati (2020), the t-test was conducted to determine the significance of the independent variables individually influencing the dependent variable by comparing the calculated t-test with the t-table at a significance level of 5%. The t-table value was 1.984.

Table 9. T-Test Results

Hypothesis	Coefficient	T-statistic	Prob.	Descriptive
X1 → Z	-0.008533	-0.724644	0.4701	No effect
X2 → Z	-0.070053	-1.342003	0.1821	No effect
X3 → Z	0.010635	2.188531	0.0306	Influential
X1 → Y	0.005589	0.633868	0.5274	No effect
X2 → Y	-0.163336	-3.724676	0.0003	Influential
X3 → Y	0.000123	0.034489	0.9725	No effect
Z → Y	0.257745	3.911835	0.0002	Influential

Source: Processed Secondary Data (2026)

Results of the test of the influence of CAR (X1) on NIM (Z)

Based on Table 9. the CAR (X1) probability value is $0.4701 > 0.05$. This result indicates that CAR (X1) does not significantly influence the NIM (Z) variable. On the other hand, the t-statistic value is $-0.724644 < -1.984$, which indicates that CAR (X1) does not significantly influence the NIM (Z) variable. Therefore, based on this result, H1 is rejected. This result indicates that capital adequacy does not directly affect the bank's ability to generate interest margins. Where, a strong level of capital adequacy is not the main determinant of the amount of interest margins. This result is in line with previous research by Salsabila et al. (2024) and Zulkifli & Eliza (2018). And contrary to the research of Noor & Suhendra (2024) which states that the higher the capital adequacy owned by the bank, the higher the NIM generated by the bank because a high capital ratio indicates the bank's ability to provide funds for lending purposes so as to obtain higher interest income, as well as anticipate the possible risk of loss due to bank operations.

Results of the test of the influence of NPL (X2) on NIM (Z)

Based on Table 9. the NPL probability value (X2) is $0.1821 > 0.05$. This result indicates that NPL (X2) does not significantly influence the NIM variable (Z). On the other hand, the t-statistic value is $-1.342003 < -1,984$ which shows that NPL (X2) does not significantly affect the NIM variable (Z). Therefore, based on these results, H2 is rejected. These results are in line with Merry et al. (2022) and Susilawati & Nurulrahmatiah (2021) who concluded that NPL has no effect on NIM.

Results of the test of the influence of LDR (X3) on NIM (Z)

Based on Table 9. the LDR (X3) probability value is $0.0306 < 0.05$. This result indicates that LDR (X3) has a significant effect on the NIM (Z) variable. On the other hand, the t-statistic value is $2,188531 > 1.984$, which indicates that LDR (X3) has a significant effect on the NIM variable (Z). Therefore, based on these results, H3 is accepted. This result is in line with Zulkifli & Eliza (2018) and Rahagi et al. (2023) who stated that LDR affects NIM.

Test results of the influence of CAR (X1) on ROA (Y)

Based on Table 9. the CAR (X1) probability value is $0.5274 > 0.05$. This result indicates that CAR (X1) does not significantly influence the ROA (Y) variable. On the other hand, the t-statistic value is $0.633868 < 1.984$, which indicates that CAR (X1) does not significantly influence the ROA (Y) variable. Therefore, based on these results, H4 is rejected. This result is in line with Hakim & Syatoto (2024) and Silpiani & Kusumawardani (2025) who stated that CAR has no effect on ROA.

Results of the test of the influence of NPL (X2) on ROA (Y)

Based on Table 9. the NPL Probability value (X2) is $0.0003 < 0.05$. This result indicates that NPL (X2) has a significant effect on the ROA variable (Y). On the other hand, the t-statistic value is $-3.724676 > -1.984$, which indicates that NPL (X2) has a significant effect on the ROA variable (Y). Therefore, based on these results, H5 is accepted. This result is in line with the research of Meivia & Fitriyadi (2025), Khoiriyah & Dailibas (2022), and Putrianingsih & Yulianto (2016) which concluded that NPL affects ROA.

Results of the test of the influence of LDR (X3) on ROA (Y)

Based on Table 9. the LDR (X3) probability value is $0.9725 > 0.05$. These results indicate that LDR (X3) does not significantly influence the ROA (Y) variable. On the other hand, the t-statistic value is $-0.034489 < -1.984$, which indicates that LDR (X3) does not significantly influence the ROA (Y) variable. Therefore, based on these results, H6 is rejected. The results of this study are in line with research conducted by Tresnawaty (2022) and Widyastuti & Aini (2021) which stated that LDR has no effect on ROA.

Results of the test of the influence of NIM (Z) on ROA (Y)

Based on Table 9. the probability value of NIM (Z) is $0.0002 < 0.05$. This result indicates that NIM (Z) does not significantly influence the ROA (Y) variable. On the other hand, the t-test result is $-3.911835 > -1.984$, which indicates that NIM (Z) significantly influences the ROA (Y) variable. Therefore, based on these results, H7 is accepted. The results of this study are in line with previous studies conducted by Merry et al. (2022) and Noor & Suhendra (2024) which stated that NIM influences ROA.

Table 10. Sobel test

Hypothesis	T-statistic	P-value	Descriptive
X1 → Z → Y	-0.71248881	0.47616214	No effect
X2 → Z → Y	-1.2693886	0.2043025	No effect
X3 → Z → Y	1.90976693	0.5616323	No effect

Source: Processed Secondary Data (2026)

In this study, hypothesis testing used two criteria: a P-value < 0.05 or 5%, indicating a significant effect on the variable. Furthermore, if the t-statistic value is greater than the t-table value at a rate of 5%, the variable has a significant effect.

The results of testing CAR (X1) against ROA (Y) via NIM (Z)

Based on Table 10. the P-value for the CAR (X1) variable is > 0.05 , which is 0.476. These results indicate that the CAR (X1) variable has no effect on the ROA (Y) variable mediated by the NIM (Z) variable. Where, the t-test result is $-0.712 < -1.984$, this indicates that the CAR (X1) variable does not have a significant effect on the ROA (Y) variable mediated by the NIM (Z) variable. In other words, NIM (Z) cannot mediate the effect of CAR (X1) on ROA (Y). Therefore, H8 is rejected. These results are consistent with research (Salsabila et al., 2024) which states that NIM cannot mediate the effect of CAR on ROA.

The results of testing NPL (X2) against ROA (Y) via NIM (Z)

Based on Table 10. the P-value for the NPL variable (X2) > 0.05 , which is 0.204. These results indicate that the NPL variable (X2) has no effect on the ROA variable (Y) mediated by the NIM variable (Z). Where, the t-test result is $-1.269 < -1.984$, this indicates that the NIM variable (X2) does not have a significant effect on the ROA variable (Y) mediated by the NIM variable (Z). In other words, NIM (Z) cannot mediate the effect of NPL (X2) on ROA (Y). Therefore, H9 is rejected. The results of this study are in line with the research of Meivia & Fitriyadi (2025) and Purbadasuha & Prasetyo (2024) which states that NIM cannot mediate the effect of NPL on ROA.

The results of the LDR (X3) test on ROA (Y) via NIM (Z)

Based on Table 10. the P-value for the LDR (X3) variable is > 0.05 , which is 0.056. These results indicate that the LDR (X3) variable has no effect on the ROA (Y) variable mediated by the NIM (Z) variable. Where, the t-test result is $1.909 < 1.984$, this indicates that the LDR (X3) variable does not have a significant effect on the ROA (Y) variable mediated by the NIM (Z) variable. In other words, NIM (Z) cannot mediate the effect of LDR (X3) on ROA (Y). Therefore, H10 is rejected. The results of this study are in line with research conducted by Noor & Suhendra (2024) and Meivia & Fitriyadi (2025) which concluded that NIM cannot mediate the LDR flow on ROA.

4. CONCLUSION

This study aims to analyze the influence of fundamental bank performance factors on profitability, with Net Interest Margin as a mediating variable in banks listed on the Indonesia Stock Exchange for the 2020-2024 period. The results of this study indicate that CAR and NPL do not significantly affect NIM, while LDR significantly affects NIM. On the other hand, CAR and LDR do not significantly affect ROA, but NPL and NIM significantly affect ROA. Furthermore, NIM is unable to mediate the relationship between fundamental bank performance factors, namely CAR, NPL, and LDR, and profitability. These findings indicate that bank profitability is highly dependent on credit risk control to reduce reserve costs, as well as efficient management of funding and financing structures to maximize returns on assets.

5. REFERENCES

- Admadja, S. A., Setyowati, S. W., Retnasari, A., & Irianto, M. F. (2023). Pengaruh CAR, LDR Dan NPL Terhadap Profitabilitas (Studi Kasus Pada Bank yang Terdaftar di BEI per 2019-2022). *Jurnal Akuntansi Neraca*, 1(2), 24–34.
- Anindiansyah, G., Sudiyatno, B., Puspitasari, E., & Susilawati, Y. (2020). Pengaruh CAR, NPL, BOPO, dan LDR Terhadap ROA Dengan NIM Sebagai Variabel Intervening (Studi Pada Bank yang Go Publik di Bursa Efek Indonesia Periode Tahun 2015-2018). *Sendiu*, 560–567.
- Annisa, N., Ernitawati, Y., & Wulandari, H. K. (2022). Analisis CAR, LDR, BOPO, dan NPL Terhadap ROA (Studi Empiris pada BPR Nusamba Se-Pulau Jawa per 2019-2021). *Jurnal Kewarganegaraan*, 6(2), 4666–4677.
- Assegaff, H., Ermawati, W. J., & Slamet, A. S. (2026). The Effect Of Non-Performing Loan (NPL), Capital Adequacy Ratio (CAR) & Loan to Deposit Ratio (LDR) on Return on Assets (ROA) (Case Study: Goverment-Owned National Banks). *Indonesian Interdisciplinary Journal of Sharia Economics (IIJSE)*, 9(1), 366–381.
- Astuti, L. Y., & Badjuri, A. (2023). Pengaruh NPL dan LDR terhadap Kinerja Keuangan dengan NIM Sebagai Variabel Intervening. *Jurnal Manajemen Dan Akuntansi*, 18(2), 460–471.
- Bhaktiar, R. E., & Fatoni, P. I. (2024). Pengaruh Non-Performing Loan (NPL) Terhadap Profitabilitas (ROA) pada Perusahaan Perbankan yang Terdaftar di Bursa Efek Indonesia (BEI) Periode 2019-2023. *Accounting Reseach Journal*, III(1), 1–17.

- Hakim, A. R., & Syatoto, I. (2024). Pengaruh Loan to Deposit Ratio, Capital Adequacy Ratio, dan Non Performing Loan, Terhadap Profitabilitas Pada PT. Bank DKI Periode 2009-2023. *Journal of Research and Publication Innovation*, 2(4), 1016–1026.
- Khoiriyah, S., & Dailibas. (2022). Pengaruh NPL dan LDR Terhadap Profitabilitas (ROA). *Competitive Jurnal Akuntansi Dan Keuangan*, 6(1), 138–144.
- Kustiawati, E., & Abdurohim. (2025). Pengaruh Loan to Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), dan Non-Performing Loan (NPL) terhadap Return on Assets (ROA) dengan Ukuran Bank Sebagai Variabel Moderasi pada Bank Perkreditan Rakyat (BPR) di Jawa Barat Periode 2019-2023. *Jurnal Ilmiah Ilmu Pendidikan*, 8(3), 2645–2656. <https://doi.org/10.54371/jiip.v8i3.7221>
- Meivia, C. D., & Fitriyadi. (2025). Pengaruh NPL, LDR, Terhadap ROA dengan NIM sebagai Variabel Intervening Pada Bank BUMN yang Terdaftar di Bursa Efek Indonesia (BEI) Periode 2016-2023. *Jurnal Bisnis Dan Pembangunan*, 14(03), 236–243.
- Merry, Edward, Y. R., Afiezan, H. A., & Tarigan, A. E. (2022). The Effect of Non-Performing Loans, Loan to Deposit Ratios of Operating Expenses and Operating Income On Return on Assets with Net Interest Margin as an Intervening Variable in Banking Companies Listed in Indonesia Stock Exchange Period 2019 -2021. *International Journal of Social Science Research and Review*, 5(10), 381–396. <https://doi.org/10.47814/ijssrr.v5i10.578>
- Mudawanah, S. (2019). Analisis Operating Leverage (DOL), Financial Leverage (DFL), dan Combination Leverage (DCL) Terhadap Earning Per Share (EPS) Pada Perusahaan LQ45 di Bursa Efek Indonesia. *Jurnal Studia Akuntansi Dan Bisnis*, 7(3), 187–198.
- Noor, G. M. F., & Suhendra, E. susy. (2024). The Effect of Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR) and Non-Performing Loan (NPL) Against Return on Asset (ROA) With Net Interest Margin (NIM) as an Intervening Variable in BUMN Bank Listed on the Indonesia Stock Exchange 2018-2022. *Journal of Economics, Finance and Management Studies*, 07(06), 3613–3619. <https://doi.org/10.47191/jefms/v7-i6-52>
- Pradigdo, A. C., Albart, N., & Huda, N. (2025). Systematic Literature Review: CAR, LDR, NIM and NPL on Banking Profitability in Indonesia. *Jurnal Bisnis, Manajemen Dan Perbankan*, 11(2), 372–386. <https://doi.org/10.21070/jbnp.v11i2.2112>
- Purbadasuha, H. R. P., & Prasetyo. (2024). Pengaruh CAR, BOPO, dan NPL terhadap Return on Assetss dengan Net Interest Margin Sebagai Variabel Mediasi. *Diponegoro Journal of Management*, 13(5), 1–15.
- Purwoko, D., & Sudiyatno, B. (2013). Faktor-Faktor yang Memengaruhi Kinerja Bank (Studi Empirik pada Industri Perbankan di Bursa Efek Indonesia). *Jurnal Bisnis Dan Ekonomi*, 20(1), 25–39.
- Putri, D. A. R. D. P., & Bella, C. (2025). Pengaruh Capital Adequacy Ratio (CAR), Non Performing Loan (NPL), Loan to Deposit Ratio (LDR), dan Net Interest Margin (NIM), terhadap Return on Asset (ROA) (Studi Kasus pada Bank Umum yang Listed di Bursa Efek Indonesia Tahun 2019-2023). *Jurnal Economic Education Journal*, 7(3), 1015–1032.

- Putrianingsih, D. I., & Yulianto, A. (2016). Pengaruh Non Performing Loan (NPL) dan Capital Adequacy Ratio (CAR) Terhadap Profitabilitas. *Management Analysis Journal*, 5(2), 110–115.
- Rahagi, M. R., Najmudin, & Laksana, R. D. (2023). The Effect of Net Interest Margin as a Mediator and Selected Factors in Determining the Profitability of Digital Banks. *Jurnal Riset Manajemen*, 1(1), 10–27.
- Rangkuti, A. R. H., ibdalsyah, & Devi, A. (2021). Pengaruh Keuangan Inklusif dan Bank Syariah terhadap Konsumsi Nasional Indonesia. *Jurnal Kajian Ekonomi & Bisnis Islam*, 4(1), 27–37. <https://doi.org/1047467/elmal.v4i1.520>
- Salsabila, A., Sujadi, E., & Sarmigi, E. (2024). The Effect Of NPL, LDR, And CAR On ROA With NIM As A Mediation Variable In Conventional Bank Listed On The Indonesian Stock Exchange (BEI). *Jurnal Ekonomi*, 13(02), 1698–1710. <https://doi.org/10.54209/ekonomi.v13i02>
- Setiawati, R. I. S. (2020). Analisis Pengaruh Faktor-Faktor Fundamental Kinerja Bank dan Makro Ekonomi Terhadap Stabilitas Perbankan di Indonesia. *Jurnal Ilmiah Bisnis Dan Ekonomi Asia*, 14(2), 123–132. <https://doi.org/10.32812/jibeka.v14i2.194>
- Silpiani, S., & Kusumawardani, A. (2025). Pengaruh NIM, NPL, dan CAR Terhadap ROA Pada Perusahaan Perbankan Yang Terdaftar di BEI Periode Tahun 2021-2024. *Economics and Business*, 8(1), 461–470.
- Simorangkir, R. T. M. C. (2019). Pengaruh Kinerja Keuangan Terhadap Return Saham Perusahaan Pertambangan. *Jurnal Bisnis Dan Akuntansi*, 21(2), 155–164.
- Susilawati, S., & Nurulrahmatiah, N. (2021). Pengaruh Non-Performing Loan (NPL) dan Loan to Deposit Ratio (LDR) terhadap Return on Asset (ROA) dengan Net Interest Margin (NIM) sebagai Variabel Mediasi pada Bank BUMN yang Terdaftar di BEI. *Jurnal Maksipreneur*, 11(1), 69–89.
- Tresnawaty, N. (2022). Analisis Loan to Deposit Ratio, Non Performing Loan, Net Interest Margin Terhadap Profitabilitas Bank. *Jurnal Ilmiah Akuntansi Dan Ekonomi*, 7(1), 22–31. <https://doi.org/10.54964/liabilitas/>
- Widyastuti, P. F., & Aini, N. (2021). Pengaruh CAR, NPL, LDR Terhadap Profitabilitas Bank (ROA) Tahun 2017-2019. *Jurnal Ilmiah Mahasiswa Akuntansi*, 12(03), 1020–1930.
- Yeni, D. P., Purba, P. Y., Tambunan, C. J. M., Marbun, H. A. U., & Putri, T. O. D. S. (2024). Pengaruh NPL Dan LDR Terhadap ROA Pada Perbankan Yang Terdaftar Di Bursa Efek Indonesia (BEI) Periode 2020-2022. *Jurnal Riset Akuntansi Multiparadigma*, 11(1), 66–75.
- Z, Z., & Eliza, R. (2018). Determinan Net Interest Margin Perbankan Nasional: Aplikasi Model Regresi Data Panel fixed Effect. *Jurnal Ilmiah Manajemen*, 8(3), 640–656.