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The Impact of Operating Expenses and Operating Income on the Financial Performance of Conventional Banks in Indonesia

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Abstract. This study aims to empirically prove the moderating role of Loan to Deposit Ratio (LDR) on the effect of Capital Adequacy Ratio (CAR) and Operating Cost of Operating Income (BOPO) on financial performance and proxied by Return on Assets (ROA). The study population consists of all banks in Indonesia. The sample is only of conventional banks that meet the specified criteria. WarpPLS version 7.0 was used as the data analysis tool. The results of this study show that only BOPO has an impact on ROA. CAR does not affect ROA, and LDR has no moderating effect on the relationship. This study suggests that conventional banks in Indonesia should pay attention to BOPO as it influences ROA, which in turn affects the investment decisions of potential investors and investors.

Keywords: CAR, BOPO, LDR, ROA.

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Introduction

Indonesia's banking sector growth slowed significantly in 2023. Several indicators showed suboptimal performance. This was marked by the slowing development of credit and third-party funds (DPK). As of September 2023, credit growth reached only 6.44% YTD (year to date), much lower than 11.35% in the previous year, while deposits contracted by 0.08%. The main reasons were the increase in benchmark interest rates, the global economic slowdown, and shrinking commodity prices. The capital adequacy ratio (CAR), liquid assets to deposits ratio (AL/DPK), and liquid assets to non-core deposits ratio (AL/NCD) declined but remained above the minimum requirement (CNBC Indonesia, 2023). At the same time, non-performing loans (NPLs) increased slightly. This challenge is similar to the situation in 2018. As a result, businesses are less willing to invest and borrow, which has led to slower loan growth. This decline is indicative of the challenges involved in maintaining the stability of the financial system.

Under these circumstances, the government and relevant institutions must take prudent measures to address the problem and ensure that the financial system remains stable. The banking sector is the backbone of our economy. Banks help manage the money supply to keep the economy running smoothly. They also serve as a bridge between those who have more money and those who need it, improving citizens' economy and quality of life. The banking sector is unpredictable; therefore, regular performance evaluation is essential for ensuring the bank's sustainability and success. Given the important role of conventional banks in the national financial system, a deeper understanding of the factors affecting their performance will provide banking supervisors and practitioners with better insights for the formulation of appropriate policies to maintain economic stability (Saputri *et al.,* 2023). One important indicator is the Loan Deposit Ratio (LDR), which is the ratio of the total loans granted by the bank to the total funds received from the public and the bank's capital. The higher the LDR ratio, the greater the bank's profit potential, provided the loans are properly channeled. An Increase in profits will ultimately strengthen the bank’s overall performance (Rohmiati *et al.,* 2019).

A common way to measure a bank's success in managing its business is to examine its profitability ratios. These ratios measure how efficient the bank is at generating profits from all of its activities over a given period. One of the most commonly used ratios is the return on assets (ROA), which shows how much profit the bank has made compared to its total assets (Fadilah & Muniarty, 2023). A higher ROA indicates a higher level of profitability for the bank, which translates into a more substantial bank position and more effective asset use (Fadilah & Muniarty, 2023). Some factors that can affect a bank's ROA include the Capital Adequacy Ratio (CAR), which shows how well the bank manages its capital; Operating Expenses to Operating Income (BOPO), which describes the bank's operating efficiency; and LDR, which shows how well the bank manages its liquidity (Sitti Masyita & Sarmila, 2024).

CAR measures how well a bank can handle the risk of losing money. The ratio demonstrates the bank's capital for high-risk assets, such as loans. A higher CAR means the bank is stronger and can better handle unexpected conditions (Sitti Masyita & Sarmila, 2024). This means that the better a bank's CAR ratio, its ROA will increase (Barizi *et al.*,2022), (Riadi *et al.,* 2021), (Diantini *et al.,* 2020) But (Fadilah & Muniarty, 2023), (Mutawali *etal.*,2022), (Simanjuntak *et al.,* 2022) They are stated otherwise.

In addition to CAR, the BOPO ratio significantly impacts a bank's ROA. BOPO is the ratio of the total budget spent by the bank to carry out its operations to the total income generated from these operational activities (Sunaryo, 2020). This ratio measures how effectively the bank manages its costs. In other words, BOPO shows how well the bank ensures that each dollar spent generates maximum profit (Diantini *et al.,* 2020). In other words, operational efficiency, as reflected in the BOPO ratio, has an essential impact on a bank's financial health. The more efficiently a bank manages its costs, the lower the risk of economic distress (Fadilah & Muniarty, 2023). Several studies have shown that a bank's BOPO is high, indicating it needs to manage its costs efficiently. Conversely, a low BOPO demonstrates that the bank has effectively managed its operations. A high BOPO negatively affects a bank's ROA (Indrayana *et al.,* 2022), (Widyaningsih & Sampurno, 2022) (Pamungkas & Manda, 2021), (Riadi *et al.,* 2021). However, unlike (Fadilah & Muniarty, 2023), (Mutawali *et al.,* 2022), (Ningsih & Dewi, 2020), which says otherwise.

The loan can influence CAR and BOPO's effect on banks' financial performance relative to LDR. LDR is a ratio used to measure bank liquidity. It compares the total budget and loans over some time. The CAR proves the bank's performance in completing the minimum role set. As a result, the LDR funds can function as a moderation between CAR and the bank's

financial capability (Sastrawan *et al.,* 2023). BOPO is a ratio that helps assess how effectively a bank manages its operating expenses to achieve profitability. This ratio shows how well bank managers control costs. BOPO is also called the efficiency ratio (Fadilah & Muniarty, 2023). LDR had a significant impact on the financial performance of banks, enhancing the influence of BOPO. Research (Sastrawan *et al.,* 2023) suggests that LDR moderates the influence of CAR and BOPO. In contrast to the research (Wardhani, 2019), LDR cannot reinforce the impact of CAR and BOPO on financial performance.

Based on this explanation, understanding the interaction of these variables can help strategic decisions to maintain market confidence and banking sector stability. This study has important value in understanding the dynamics of bank performance and its implications for economic policy. The questions that must be answered in this study are: Does CAR and BOPO affect ROA? and Does LDR moderate the effect? Studies using the role of LDR as a moderating variable are still rarely used, so this study is worth researching.

Literature Review

Signaling Theory

Spence first introduced signaling theory in his 1973 article. Spence discusses signals in the labor market (Spence, 1973). This theory arises due to information asymmetry. According to signaling theory, the presentation of sound financial statements reflects the quality of an institution. The report serves as a signal conveyed by the bank (Prayogi, 2024). Financial statement signals can be in various ratios that reflect bank performance. Therefore, indicators such as an increase in the CAR ratio and BOPO efficiency are expected to provide positive signals to investors, affecting bank stock prices (Chaerunisak *et al.,* 2019). The relationship between LDR and signal theory is that high levels of liquidity can provide positive signals to creditors. If a bank succeeds in channeling credit effectively, the LDR value will increase, supporting the increase in bank profits (Martini, 2022).

Hypothesis Development

Relationship of CAR and ROA

The CAR ratio measures a bank's ability to support risky assets while maintaining capital adequacy. A higher ratio indicates stronger financial performance (Sitti Masyita & Sarmila, 2024) CAR plays a crucial role in determining a bank's financial stability and profitability. Therefore, it can be concluded that there is a statistically significant positive relationship between CAR and ROA. In other words, the better the CAR ratio of a bank, the higher its ROA will be. The argument is consistent with signal theory, which states that companies send signals that elicit investor responses (Chaerunisak *et al.,* 2019). This response can be seen in stock prices or an increase in financial performance. This statement is consistent with (Sitti Masyita & Sarmila, 2024), (Barizi *et al.,* 2022), (Indrayana *et al.,* 2022), (Riadi *et al.,* 2021), (Diantini *et al.,* 2020) The data indicates that CAR has a beneficial effect on ROA.

H1: CAR has a positive effect on ROA.

Relationship of BOPO and ROA

BOPO is a ratio used to compare the total costs incurred by the bank in its operating activities with the total income earned from these activities. In other words, BOPO shows how efficiently the bank manages its costs. Using the BOPO ratio, the bank can assess whether its operational performance aligns with the objectives of management and shareholders and ensure that all its resources are utilized optimally (Diantini *et al.,* 2020) The BOPO ratio serves as an indicator of operational efficiency, influencing financial performance. Lower operating costs mean less risk. This is in line with signal theory, which states that positive or negative signals from the company will have an impact on how investors react (Chaerunisak *et al.,* 2019). This response is seen in stock prices or financial performance. This statement is consistent with (Fadilah & Muniarty, 2023) (Indrayana *et al.,* 2022), (Widyaningsih & Sampurno, 2022), (Pamungkas & Manda, 2021), and (Riadi *et al.,* 2021), which shows that the BOPO variable significantly affects financial performance.

H2: BOPO has a negative effect on ROA.

How does LDR affect the relationship between CAR, BOPO, and ROA?

LDR measures the bank's loan disbursement ratio to the total budget raised from the public and the bank's capital. Higher LDR numbers mean more significant profit potential for banks that provide loans efficiently. This increase in profit will, in turn, improve the bank's overall performance (Ningsih &

Dewi, 2020). In other words, the amount of a bank's LDR will directly affect its performance (Indrayana *et al.,* 2022). This LDR measures how much of the bank's budget is set aside to be disbursed in installments. A high LDR ratio means a more profitable bank, which will improve performance. Various research has been conducted to identify factors that affect bank profitability (Sitti Masyita & Sarmila, 2024), (Widyaningsih & Sampurno, 2022), (Riadi *et al.,* 2021), showing that LDR significantly impacts ROA.

H3: LDR moderates the effect of CAR on ROA.

H4: LDR moderates the effect of BOPO on ROA.

Research Method

This study uses a quantitative approach, applying appropriate statistical methods to test the hypotheses formulated. Financial statements of conventional banks still in operation are used as secondary data. The company is publicly listed on the Indonesia Stock Exchange. The data was obtained from the website www.idx.co.id from 2019 to 2023.

The population of this study is made up of banking companies in Indonesia. The purposive sampling method was used. The following criteria were used to determine the sample: listed conventional commercial banks must have complete and relevant financial statements, and the selected banks must also have positive ratios and profitability throughout 2019-2023.

In this study, a bank's profit level measured by ROA is the leading benchmark for which we want to know the cause. Some factors that are thought to affect ROA are CAR and BOPO. In addition, the researchers want to see if the LDR can strengthen or weaken the relationship between the CAR, the BOPO, and the ROA. The following methods are used to measure these variables:

Table 1
Variable Measurement

No	Measurement
1	$ROA = \frac{Bank\ Net\ Profit}{Total\ Asset} \times 100\%$
2	$CAR = \frac{Bank\ Capital}{Risk\ Weighted\ Assets} \times 100\%$
3	$BOPO = \frac{Total\ Operating\ Costs\ (Expenses)}{Operating\ Revenue} \times 100\%$
4	$LDR = \frac{Total\ Loans}{Total\ Third\ Party\ Funds} \times 100\%$

This study used the documentation study method as the data collection technique. In addition, the analysis was conducted using WarpPLS version 7.0. WarpPLS has the potential to be a suitable choice for this research, as it appears to have some advantages, such as its ability to handle formative measurement models. It may also be more advantageous when the sample size is relatively small. It also can analyze nonlinear relationships between variables. These advantages make WarpPLS a potentially suitable choice for examining the relationships between CAR, BOPO, LDR, and ROA in Indonesian banking data (Hair *et al.,* 2017)

Result and Discussion

The total population analyzed includes 47 conventional banks. From 2019 to 2023, the following banking institutions have been listed on the Indonesia Stock Exchange for over five years. Please refer to Table 2 for details regarding the sample data used:

Table 2
Research Samples

No	Criteria	Total
1	Banking Companies Listed on the IDX	47
2	Banking Companies Not Including Conventional Banks on IDX	(4)
3	Final Sample	43
4	Total Observations during the 2019-2023 period	5
5	Total Research Sample	215

Source: www.idx.co data processed by the author, 2024

The following information is obtained from the results of data processing with WarpPLS:

Table 3
Model Fit and Quality Indices

Model Fit and Quality Indices	Fit Criteria	Analysis Results	Information
Average Path Coefficient (APC)	P-value ≤0.05	0.006	Fit
Average R-Square (ARS)	P-value ≤0.05	P<0.001	Fit
Average Adjusted R-Squared (AARS)	P-value ≤0.05	P<0.001	Fit
Average Block VIF (AVIF)	Acceptable if ≤ 5; Ideally ≤ 3,3	1.525	Fit

Average Full Collinearity (AFVIF)	Acceptable if ≤ 5; Ideally ≤ 3,3	2.571	Fit
Goodness Tenenhaus (GoF)	Small ≥ 0,1; Medium ≥ 0.25; Large > 0.36	0.460	Large
R-Squared Contribution Ratio (RSCR)	Acceptable if ≥ 0.9; Ideally = 1	0.936	Fit
Statistical Suppression Ratio (SSR)	Acceptable if ≥ 0.7	1.000	Fit
R-Square coefficients:		0.212	
Adjusted R-squared coefficients		0.197	
Q-squared coefficients		0.287	

Source: data processing, 2024.

Table 3 shows that the tested model performed well. Based on the evaluation criteria, all the data show ideal results, and the GoF value shows that the model is of high quality. Meanwhile, R-squared (0.212) and Adjusted R-squared (0.197) explain how the independent variables affect the dependent. There is no multicollinearity problem, and the model's predictive ability is reasonable based on the Q-squared number (0.287). Based on these results, the model is considered statistically sound and reliable for explaining the relationship between variables. Here are the research data management results:

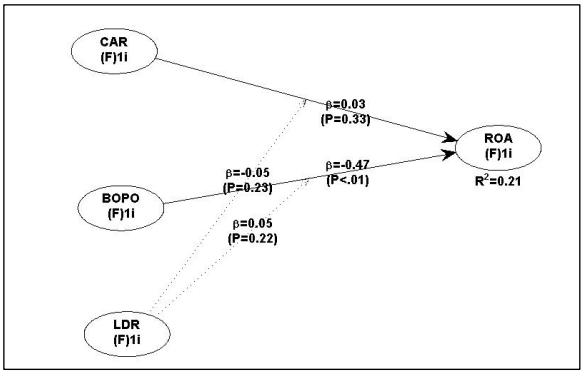

Fig 1. Data Management Results
Source: data processing, 2024.

Effect of CAR on ROA

Based on Figure 1, it can be seen that the CAR to ROA has a value of β = 0.03 and is significant at the p-value level = 0.33. These results indicate that there is no substantial direct effect. Therefore, the first hypothesis (H1) is rejected. It turns out that high and low CAR do not affect ROA. This is suspected because ROA is not only influenced by the bank's CAR, but other factors also influence ROA because CAR shows that most of the bank's capital is used to cover potential risks, such as bad debts or high-risk investments, which can limit the space for banks to expand their business. This limitation on expansion can ultimately affect the bank's overall financial performance. In other words, the bank must maintain stability and anticipate risks to reduce the bank's financial flexibility to expand. The findings support this argument (Indrayana *et al.*, 2022), (Fadilah & Muniarty, 2023), (Mutawali *et al.*, 2022), (Ningsih & Dewi, 2020) (Simanjuntak *et al.*, 2022) stated that CAR does not affect ROA. However, this finding contradicts the results of the study (Sitti Masyita & Sarmila, 2024), (Barizi *et al.*, 2022), (Riadi *et al.*, 2021), (Diantini *et al.*, 2020) state otherwise.

The Effect of BOPO on ROA

Figure 1 also explains that BOPO on ROA has a value of β = -0.47 and is significant at the p-value <0.01 level. The results show a significant negative effect. The data analysis confirms that the second hypothesis, H2, is accepted. This research shows that if banks can run their operations efficiently and reduce operating costs, a lower BOPO will provide a positive signal about their financial health, indicating a lower risk of financial problems. So, if the bank can reduce its operating costs, profits will increase, providing a positive signal that can increase market confidence. The results of this study are in alignment with those previously obtained by (Indrayana *et al.*, 2022), (Sitti Masyita & Sarmila, 2024), (Widyaningsih & Sampurno, 2022), (Chaerunisak *et al.*, 2019), (Simanjuntak *et al.*, 2022) The data indicate that operating expenses exert a considerable negative influence on ROA.

The moderating effect of LDR on CAR & ROA

The results presented in Table 3 and Figure 1 indicate that the LDR does not significantly moderate the relationship between the CAR and ROA. The

coefficient value is β = -0.05, with a p-value of 0.23, which is not statistically significant. Based on these results, Hypothesis 3 (H3), which proposed that LDR moderates the effect of CAR on ROA, is rejected. These findings suggest that variations in a bank's LDR do not strengthen or weaken the impact of CAR on financial performance. One possible explanation is that multiple factors beyond CAR and LDR influence ROA. While LDR can signal a bank's lending strategy, an excessive increase in LDR could lead to higher risk exposure, potentially reducing ROA. Conversely, if lending is too restrictive, it may harm market perception and investor confidence. This is in line with (Indrayana *et al.,* 2022), (Pamungkas & Manda, 2021), (Wardhani, 2019), (Setyaningsih *et al.,* 2023), (Martini, 2022), (Dana & Utama, 2024), which also found that LDR does not significantly moderate the CAR-ROA relationship. However, it contradicts findings from (Sitti Masyita & Sarmila, 2024), (Widyaningsih & Sampurno, 2022), (Riadi *et al.,* 2021) which suggests that LDR does play a moderating role.

The moderating effect of LDR on BOPO & ROA

Similarly, the study results indicate that LDR does not significantly moderate the relationship between BOPO and ROA. The coefficient value is β = 0.05, with a p-value of 0.22, which is also not statistically significant. Based on these findings, Hypothesis 4 (H4), which proposed that LDR moderates the effect of BOPO on ROA, is also rejected. This indicates that a bank's liquidity position, as measured by LDR, has no substantial impact on the effect of BOPO on financial performance. LDR reflects a bank's ability to manage liquidity through loan disbursement. Other financial and operational strategies may overshadow its role as a moderating factor. A high LDR could indicate aggressive lending, which, if not well-managed, may lead to a rise in non-performing loans (NPLs), thereby diminishing profitability. This is in line with (Indrayana *et al.,* 2022), (Pamungkas & Manda, 2021), (Wardhani, 2019), (Setyaningsih *et al.,* 2023), (Martini, 2022), (Dana & Utama, 2024), which also concluded that the LDR does not significantly moderate the relationship between BOPO and ROA. However, the results contradict those of (Sitti Masyita & Sarmila, 2024), (Widyaningsih & Sampurno, 2022), (Riadi *et al.,* 2021) which found a significant moderating effect.

Conclusion

BOPO significantly impacts the financial performance of conventional banks, as it represents the ratio of total operating expenses to total operating income. Of course, investors will take BOPO into account when making investment decisions. Meanwhile, CAR and the role of LDR as facilitators have yet to be able to impact ROA.

The relatively low R-squared value of only 21% is a limitation of this study. Based on these weaknesses, the suggestion for future studies is that the research model should be modified by adding mediating or other variables potentially influencing ROA, such as NIM (Net Interest Margin) and NPL (Non-Performing *Loan*).

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