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The Effect of Liquidity, Credit Risk, and Operational Efficiency on Financial Performance in Conventional Private Commercial Banks Listed on the Indonesia Stock Exchange (2020–2024)

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Abstract: This study aims to determine the effect of the Loan to Deposit Ratio (LDR), Non-Performing Loans (NPL), and Operating Costs to Operating Income (BOPO) on Financial Performance in Conventional Private Commercial Banks Listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. This study uses secondary data obtained from annual financial reports. The population in this study comprises Conventional Private Commercial Banks listed on the Indonesia Stock Exchange (IDX) from 2020 to 2024. The total sample used consists of 21 banks selected based on the criteria of the purposive sampling method. The analysis method applied in this study is panel data regression analysis using EViews-14 software. Based on the results of the F-test, the Loan to Deposit Ratio, Non-Performing Loans, and Operating Costs to Operating Income simultaneously affect Financial Performance proxied by Return on Assets. The t-test results indicate that the Loan to Deposit Ratio partially has a positive effect on Financial Performance. Meanwhile, Non-Performing Loans partially have no effect on Financial Performance, and Operating Costs to Operating Income have a negative effect on Financial Performance.

Keyword: Loan to Deposit Ratio, Non-Performing Loan, Biaya operasional dan Pendapatan Operasional

Indonesian Abstract: *Penelitian ini bertujuan untuk mengetahui pengaruh Loan to Deposit Ratio (LDR), Non-Performing Loans (NPL), dan Biaya Operasional terhadap Pendapatan Operasional (BOPO) terhadap Kinerja Keuangan pada Bank Umum Swasta Konvensional yang Terdaftar di Bursa Efek Indonesia (BEI) selama periode 2020–2024. Penelitian ini menggunakan data sekunder yang diperoleh dari laporan keuangan tahunan. Populasi dalam penelitian ini terdiri dari Bank Umum Swasta Konvensional yang terdaftar di Bursa Efek Indonesia (BEI) dari tahun 2020 hingga 2024. Jumlah sampel yang digunakan terdiri dari 21 bank yang dipilih berdasarkan kriteria metode purposive sampling. Metode analisis yang diterapkan dalam penelitian ini adalah analisis regresi data panel dengan menggunakan perangkat lunak EViews-14. Berdasarkan hasil uji F, Loan to Deposit Ratio, Non-Performing Loans, dan Biaya Operasional terhadap Pendapatan Operasional secara simultan* *berpengaruh terhadap Kinerja Keuangan yang diproksikan dengan Return on Assets. Hasil uji t menunjukkan bahwa Loan to Deposit Ratio secara parsial berpengaruh positif terhadap Kinerja Keuangan. Sementara itu, Non-Performing Loans secara parsial tidak berpengaruh terhadap Kinerja Keuangan, dan Biaya Operasional terhadap Pendapatan Operasional berpengaruh negatif terhadap Kinerja Keuangan.*

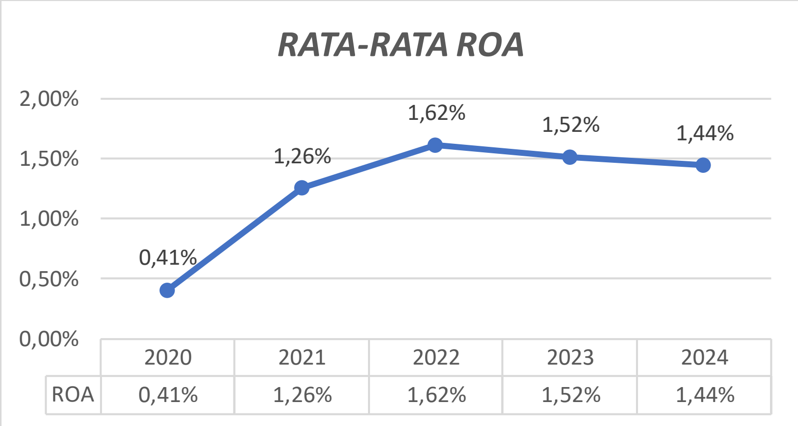
Keywords: Loan to Deposit Ratio, Non Performing Loan, *Biaya Operasional dan Pendapatan Operasional*

INTRODUCTION

As a pillar of the country's financial stability, the banking sector performs an intermediation function by connecting providers of funds with those seeking capital. Referring to Kasmir in Elfiswandi et al. (2021), the primary activities of banks focus on collecting funds from the public, providing financing, and offering financial services. This is consistent with the view of Suyatno in Elfiswandi et al. (2021), who states that the principal function of banks is to create credit. Therefore, banks must be able to manage the flow of their funds effectively to maintain sound financial performance and preserve public confidence. Throughout the 2020–2024 period, banks' financial performance depended on their ability to optimize liquidity, control non-performing loans, and maintain operational efficiency. Significant changes since the COVID-19 pandemic have created new dynamics within the banking industry. For Conventional Private Commercial Banks listed on the Indonesia Stock Exchange (IDX), maintaining financial performance stability is not only essential for complying with applicable regulations but also crucial for preserving the confidence of investors and customers. Therefore, achieving optimal financial performance is essential for the sustainability of banking operations.

In measuring the profitability of the banking sector, Return on Assets (ROA) is one of the most commonly used indicators. This ratio essentially reflects how effectively bank management utilizes all of the assets under its control to generate profits. In general, an increase in ROA indicates that the bank is becoming more effective in managing its assets, which may result in higher profits. However, ROA does not always remain stable because it is highly influenced by prevailing economic conditions. For example, during the early stages of the COVID-19 pandemic, declining revenues and increasing credit risk contributed to a decrease in banks' profitability. Conversely, as economic conditions began to recover, increased lending and efforts to reduce operational costs provided opportunities for banks to improve their financial performance.

Liniarti and Nasution (2022) explain that ROA is an appropriate measure of profitability because it focuses on the profits generated from a company's core activities. The performance of this ratio is influenced by several financial factors. Referring to Chabachib et al. (2019), variables that affect ROA include the Operating Expenses to Operating Income ratio (BOPO), Non-Performing Loans (NPL), and Loan to Deposit Ratio (LDR). Theoretically, a bank's ability to generate profits is largely determined by three factors: its success in minimizing credit risk arising from non-performing loans (NPL), its ability to optimize the allocation of funds collected from the public through lending (LDR), and its ability to control operational expenses (BOPO).



Source: Research Result
Figure 1. *Rata-Rata* ROA

In detail, during the first year of the observation period (2020), ROA stood at a relatively low level of 0.41%. This figure then increased to 1.26% in the following year and continued to rise, reaching 1.62% in 2022. Entering 2023, ROA declined to 1.52% and fell further to 1.44% in 2024. This downward trend indicates that banks had not been able to maintain stable profitability. Although the decline was relatively modest, it still indicates a slowdown in profit generation.

METHOD

This study employed a quantitative research method. The research utilized secondary data in the form of financial statements obtained from the Indonesia Stock Exchange and the official websites of the respective companies. The data were processed using EViews 14. The population of this study consisted of all companies in the banking sector, with a total of 36 listed companies. The research sample was determined using purposive sampling, which is a sampling technique based on specific considerations tailored to the objectives and problems of the study. Based on these purposive sampling criteria, 21 companies were selected as the research sample. This study involved two types of variables, namely independent variables consisting of the Loan to Deposit Ratio (LDR), Non-Performing Loan (NPL), and Operating Expenses to Operating Income (BOPO), and the dependent variable, namely Return on Assets (ROA). The data analysis techniques used in this study were as follows:

1) Descriptive statistical analysis, to present the data and analyze the characteristics of each variable.
2) Regression model selection, to determine the most appropriate model among common effects, fixed effects, and random effects using the Chow, Hausman, and Lagrange multiplier tests.
3) Classical assumption test, to ensure the reliability of the regression model to be used, with the criteria of meeting the normality assumptions, ensuring no multicollinearity, and no heteroscedasticity.
4) Panel data regression analysis, to determine the nature of the relationship between several variables. The regression model in this study is formulated in two forms: an unmoderated model and a moderated model.
5) Coefficient of Determination (R^2) analysis interprets how much variation in the dependent variable can be explained by the regression model.
6) Hypothesis testing, to verify the validity of the assumptions based on data analysis, thus concluding whether the hypothesis is accepted or rejected.

RESULTS AND DISCUSSION

	Y_ROA	X1_LDR	X2_NPL	X3_BOPO
Mean	0.011914	0.857404	0.024115	0.854778
Median	0.011000	0.827000	0.020700	0.855000
Maximum	0.043100	1.622900	0.079900	2.611000
Minimum	-0.112700	0.123500	0.000000	0.417000
Std. Dev.	0.017106	0.266034	0.015733	0.230979
Skewness	-3.479254	0.458177	1.005018	4.041775
Kurtosis	28.18408	4.015053	4.663030	33.19728
Jarque-Bera	2986.632	8.181411	29.77587	4275.336
Probability	0.000000	0.016727	0.000000	0.000000
Sum	1.251000	90.02740	2.532100	89.75170
Sum Sq.	0.045337	84.55036	0.086806	82.26633
Sum Sq. Dev.	0.030432	7.360526	0.025743	5.548545
Observations	105	105	105	105

Source: Research Result

Figure 2. Descriptive Statistical Analysis Results

The descriptive statistics show that the mean ROA was 1.19%, with a standard deviation of 1.71%, indicating considerable variation in profitability across the sampled banks. The mean LDR was 85.74%, suggesting that a substantial proportion of public deposits was allocated to lending. The mean NPL was 2.41%, while the mean BOPO was 85.48%, indicating that operational expenses represented a substantial share of operating income.

The maximum ROA of 4.31%, whereas the minimum of −11.27% and a standard deviation of 1,71%. The maximum LDR of 162.29% with a minimum value of 12,35% and a standard deviation of 26,60%, The maximum NPL of 7.99% with a minimum value of 0,00% and a standard deviation of 1,57% . Meanwhile, the maximum BOPO of 261.10% and with a minimum value of 41,70% and a standard deviation of 23,09%.

In the regression processing of the thesis, the independent variables were lagged by one period (t−1) to examine whether the financial condition of the previous period affected ROA in the subsequent period. Accordingly, the hypothesis testing and regression interpretation use LDR(t−1), NPL(t−1), and BOPO(t−1) as predictors of ROA(t).

Overall, the descriptive statistics show that all study variables varied across companies during the observation period. These differences reflect the diverse characteristics and financial conditions of the healthcare sector companies in the study sample. The Chow test produced a probability value of 0.0073, below 0.05, indicating that the Fixed Effect Model (FEM) was preferable to the Common Effect Model. The Hausman test produced a probability value of 0.0081, also below 0.05, confirming FEM as the selected panel regression model.

	X1_LDR(-1)	X2_NPL(-1)	X3_BOPO(-1)
X1_LD...	1.000000	-0.145080	-0.071849
X2_NP...	-0.145080	1.000000	0.205450
X3_BO...	-0.071849	0.205450	1.000000

Source: Research Result

Figure 3. Multicollinearity Test

Overall, all correlation coefficients between the independent and moderating variables in this study were below 0.90. Therefore, it can be concluded that there are no symptoms of multicollinearity.

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.000458	0.000402	1.138286	0.2584
X1_LDR(-1)	0.000253	0.000340	0.744091	0.4590
X2_NPL(-1)	-0.002302	0.003489	-0.659873	0.5112
X3_BOPO(-1)	-9.45E-05	0.000226	-0.417411	0.6775

Source: Research Result

Figure 4. Heteroscedasticity Test

This indicates that no independent variable in this study has a probability value ≤ 0.05. It can be concluded that the regression model in this study does not show any symptoms of heteroscedasticity.

Table 4. t-statistic test Results

Variable	Koefisien	Prob	Conclusion
LDR	0,021040	0,0136	positive and significant effect
NPL	-0,132695	0,1251	No effect significant
BOPO	-0,30063	0,0000	negative and significant effect

Source: Research Data

The Effect of LDR on ROA

LDR has a coefficient of 0.021040 with a probability value of 0.0136 < 0.05. Therefore, LDR has a positive and significant effect on ROA. This finding indicates that more effective allocation of collected funds into productive lending can increase banks' interest income and profitability. The result is consistent with Jhony et al. (2023), which reported a positive and significant effect of LDR on ROA, but differs from Wahyuni and Ompusunggu (2025), who found a negative effect.

The Effect of NPL on ROA

NPL has a coefficient of −0.132695 with a probability value of 0.1251 > 0.05. Thus, NPL does not have a significant effect on ROA. Although credit risk is an important indicator of asset quality, the variation in NPL during the observation period was not sufficient to produce a statistically significant change in profitability in the sampled banks. This result is consistent with Ramadanti and Setyowati (2022), who also found that NPL had no significant effect on ROA, but differs from Zaki et al. (2023), who reported a negative significant effect.

The Effect of BOPO on ROA

BOPO has a coefficient of −0.030063 with a probability value of 0.0000 < 0.05. The result confirms a negative and significant effect of BOPO on ROA. A higher proportion of operating expenses relative to operating income indicates lower efficiency and reduces the bank's capacity to generate profit from its assets. The finding is consistent with Wahyuni and Ompusunggu (2025), but differs from Hidayat et al. (2022), who reported a positive significant effect.

R-squared	0.817270	Mean dependent var	0.000202
Adjusted R-squared	0.765384	S.D. dependent var	0.000348
S.E. of regression	0.000169	Akaike info criterion	-14.34026
Sum squared resid	2.30E-06	Schwarz criterion	-13.73364
Log likelihood	776.8635	Hannan-Quinn criter.	-14.09444
F-statistic	15.75118	Durbin-Watson stat	1.855665
Prob(F-statistic)	0.000000		

Source: Research Result

Figure 5. Results of the Coefficient of Determination

The model has an Adjusted R-squared of 0.7654, indicating that approximately 76.54% of the variation in ROA is explained jointly by LDR, NPL, and BOPO in the selected model, while 28% the remainder is attributable to other factors outside the model. The F-test probability of 0.0000 indicates that the three independent variables jointly affect ROA.

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S.E. of regression	0.000169	Akaike info criterion	-14.34026
Sum squared resid	2.30E-06	Schwarz criterion	-13.73364
Log likelihood	776.8635	Hannan-Quinn criter.	-14.09444
F-statistic	15.75118	Durbin-Watson stat	1.855665
Prob(F-statistic)	0.000000		

Source: Research Result

Figure 6. F Test Result

The F-test probability of 0.0000 indicates that the three independent (LDR,NPL and BOPO) variables jointly affect ROA.

CONCLUSION

This study concludes that LDR, NPL, and BOPO simultaneously affect the financial performance of Conventional Private Commercial Banks listed on the IDX during 2020–2024. Partially, LDR has a positive and significant effect on ROA, NPL has no significant effect on ROA, and BOPO has a negative and significant effect on ROA.

For bank management, operational efficiency should remain a priority, particularly through controlling non-productive operating expenses and optimizing digital banking services. Liquidity management should also remain balanced so that lending expansion is supported by stable third-party funds. Although NPL was not significant in this study, prudent credit risk management and early monitoring should continue to prevent future deterioration in credit quality. For future researchers, additional variables such as NIM and CAR and a longer observation period may be considered, as well as a broader sample to improve the generalizability of the findings.

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