

The Effect of Financial Ratios, Credit Interest Rates, and Asset Growth on the Profitability of Digital Banks

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ABSTRACT: The development of digital technology has led to the emergence of digital banks that operate without a physical presence. This study analyzes the influence of CAR, BOPO, NPL, LDR, credit interest rates, and asset growth on the profitability of digital banks (ROA) in Indonesia during 2020–2024. Using multiple linear regression and data from 11 digital banks, it was found that all variables simultaneously have a significant impact on ROA. Partially, BOPO, NPL and asset growth have a significant negative impact. CAR, LDR, and credit interest rates do not have a significant impact. BOPO is the most dominant variable. These results highlight the importance of operational efficiency and credit risk management in improving the performance of digital banks.

KEYWORDS: Digital banks, ROA, BOPO, LDR, CAR, NPL, credit interest rates, asset growth, profitability.

I. INTRODUCTION

Digital transformation is currently a central issue facing the financial services sector. Modern financial technology can indeed improve the efficiency and accessibility of financial services, but it also poses new challenges such as cyber security threats and increased competition, which require banks to adapt quickly. Developments in information and communication technology have brought about major changes, including in the financial industry, one of which is reflected in the emergence of digital bank an evolution of traditional banks that place technology at the center of all their activities.

Digital banks not only change the way banks serve customers but also accelerate service processes and expand access to financial services. The Financial Services Authority (OJK) defines digital banks as financial institutions where the majority of activities are conducted through electronic channels and fully utilize information technology, without the dominant presence of physical branch offices. This differs from conventional banks, which merely add digital features to their services, as digitalization in digital banks is comprehensive and fundamental. According to Mochammad Rizaldy I. B. (2022), digital banks conduct all their activities online, with the head office as the only physical presence.

In Indonesia, digital banks have grown rapidly in recent years. The main drivers are increasing internet penetration, the growth of the digital economy, and changing preferences among younger generations (millennials and Gen Z) for practical and instant services. Several conventional banks, such as Bank Jago and Bank Neo Commerce, have undergone digital transformation, while banks like SeaBank and Bank Raya have launched directly with a digital model. This transformation opens up significant potential for expanding financial inclusion, particularly in areas with limited access to banking services. However, challenges remain, including the need for high technology investments, data security risks, and competition with fintech companies and other digital banks. In such conditions, the issue of profitability becomes very important, given that the business model of digital banks is still in the development stage and has not yet been financially established.

Profitability is an important aspect in evaluating banking performance. Accurate (2023) states that financial statements reflect the financial performance of a company for both internal and external parties, which can be seen from the effectiveness of fund utilization. Fahmi (2012) adds that financial performance indicates a company's achievements in carrying out its activities. One of the main indicators for measuring bank profitability is Return on Assets (ROA), which reflects management's ability to manage assets to generate profits.

Bank profitability is influenced by internal factors such as the Loan to Deposit Ratio (LDR), Operating Expenses to Operating Income (BOPO), Capital Adequacy Ratio (CAR), and Non-Performing Loans (NPL), as well as external factors such as credit interest (lending) rates and asset growth. Each of these factors plays a different role in determining the level of bank profitability. Solvency ratios, such as CAR, measure a bank's ability to meet its obligations in the event of liquidation (Saputra & Lian, 2018),

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while NPL reflects credit risk from problematic debtors (Sahyunu et al., 2021), and asset growth is believed to influence future profitability (Taswan, 2013).

Given the numerous factors influencing a bank's financial performance, it is important to conduct a comprehensive study to assess the extent to which financial ratios and external indicators affect profitability. Such research can contribute theoretically to the development of financial and banking science and serve as a practical reference for management and regulators in setting appropriate policies. The title of this study was chosen because it aligns with current trends in Indonesia's digital banking industry. This rapid development raises important questions regarding the factors that influence the profitability of digital banks, which are certainly different from conventional banks.

This study aims to analyze the influence of internal and external factors such as LDR, BOPO, CAR, NPL, credit interest rates, and asset growth on the profitability of digital banks as measured by ROA. The results obtained are expected to enrich empirical studies in the field of digital banking and provide a reference for strategic decision-making in bank financial management.

The uniqueness of this study compared to previous studies lies in the selection of variables, objects, and study periods. Variables such as CAR, BOPO, NPL, and LDR were selected because in previous studies they were proven to have a significant effect on bank performance, so their consistency in the context of digital banks in Indonesia needs to be re-examined.

II. LITERATURE REVIEW AND HYPOTHESIS

BANK PROFITABILITY AND ROA

Profitability ratios are used to measure the extent of the bank's ability to generate profits and meet its long-term obligations. This ratio also shows how efficient bank management is in managing financial operations, which is reflected in the level of profit generated (Hutabarat, 2020). One of the most frequently used profitability indicators in the banking industry is ROA. The formula is as follows:

$$\text{ROA} = (\text{Net income after tax} / \text{Total asset}) \times 100\%$$

A high ROA reflects the company's better financial condition, because it indicates the company's ability to maximize its assets to generate large profits (Maulida, 2023).

CAR

CAR is a ratio used to assess how much bank capital is able to bear various risks, especially those from productive assets. This ratio is obtained by comparing the bank's total capital to Risk Weighted Assets (ATMR), where the formula is as follows:

$$\text{CAR} = (\text{Capital} / \text{Risk-weighted assets}) \times 100\%$$

Research conducted by Afanasiet et.al. (2004), Bennaceur, S., & Goaid, M. (2008), Meyes & Stremmel (2012), Nurjuni Maulidayanti, et al. (2020), Sofyan, M. (2020) Sahyunu, S., et al. (2021), Devi Nurhasanah, & Maryono. (2021), and Asri Safira, A., & Suryakusuma Kholid H. (2024), show that CAR has a positive and significant effect on ROA. Based on these previous studies, the hypotheses proposed in this study are:

H₁: CAR has a positive and significant effect on ROA.

BOPO

A This ratio shows how much operating expenses the bank incurs to generate income from its main activities. The smaller the BOPO value, the more efficient the bank's operational performance. According to Suhesti N. and Maya Widyana D. (2020), BOPO is an indicator of profitability in the banking sector that measures the ratio between total operating expenses and operating income. In general, the BOPO formula is as follows:

$$\text{BOPO} = (\text{Operating expenses} / \text{Operating income}) \times 100\%$$

Research by Afanasief et al. (2004), Zulvia, Y. (2020), Sofyan, M. (2020), Arsew, V. T., Kisman, Z., & Sawitri, N. N. (2024), Ariska, A.S., & Suryakusuma, K. H. (2024), Chinthia Cahya Mega, et al. (2024), and Bambang Jatmiko (2025) found that BOPO has a negative and significant effect on ROA. Based on previous studies, the hypotheses proposed in this study are:

H₂: BOPO has a negative and significant effect on Return on Assets ROA.

NPL

NPL is a ratio that shows how large the portion of non-performing loans is compared to the total loans that have been disbursed by the bank. This ratio is an important benchmark for assessing asset quality and the effectiveness of bank credit risk management. According to Z. Dunil (2005), NPL includes debtors or groups of debtors categorized in the classification of bank credit quality levels at levels 3, 4, and 5, namely Substandard Loans, Doubtful Loans, and Bad Loans. The formula for calculating the NPL ratio is:

$$\text{NPL} = (\text{Total non-performing loans} / \text{Total loans granted}) \times 100\%$$

Research conducted by Basran Desfian (2005), Meiky T. T, et al. (2019), Wahyudi, C., & Kartikasari, M. D. (2021) and Sahyunu, S., et al. (2021) found that NPL has a negative and significant effect on ROA. Based on previous studies, the hypotheses proposed in this study are:

H₃: NPL has a negative and significant effect on ROA.

LDR

LDR is a financial ratio used to assess the liquidity and effectiveness of fund utilization by banks. This ratio shows the extent to which funds collected from the public (Third Party Funds / DPK) are channeled back in the form of loans or credit. According to Kamal (2021), LDR measures the proportion of funds channeled as credit compared to the total funds obtained from DPK as the main source of funding. The LDR formula is :

$$\text{LDR} = (\text{Total loans granted to third parties} / \text{Total DPK}) \times 100\%$$

In research conducted by Vodova (2012), Madjit et al. (2022) and Ariska, A.S., & Suryakusuma, K. H. (2024) found that LDR has a positive and significant effect on ROA. Other research such as that conducted by Asri Safira, A., & Suryakusuma Kholid H. (2024) also supports these findings, that LDR partially has a positive and significant effect on ROA. Based on previous studies, the hypotheses proposed in this study are:

H₄: LDR has a positive and significant effect on ROA.

CREDIT INTEREST RATES

The credit interest rate is a fee that must be paid by the debtor to the bank in return for the use of borrowed funds for a certain period of time. The amount of the interest rate is expressed in percentage form and is calculated based on the principal loan amount and loan duration. According to Wulandari, N. M. M., Wahyuni, M. A., and Diatmika, I. P. G. (2017), credit interest rates have a significant influence on bank income. The higher the credit rate, the greater the interest income earned by the bank. Research conducted by Muhamad Tofan, et al. (2022) shows that interest rates have a negative but insignificant effect on banking profitability. Based on this description, the hypotheses that can be proposed in this study are:

H₅: Credit interest rates have a negative effect on ROA.

ASSET GROWTH

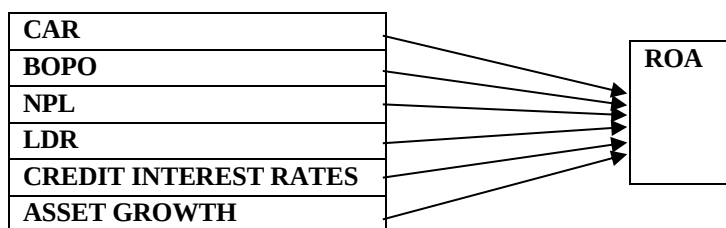
Kasmir (2014) states that company growth as an indicator of growth can be viewed from an increase in sales, assets, and net income. Although it can be analyzed from various aspects, the main essence remains the same, namely growth reflects an increase in value in a period compared to the previous period. In other words, if the bank's assets have increased from year to year, this indicates positive growth, as well as demonstrating management's ability to expand operations and manage finances effectively. To measure the growth of bank assets from year to year, the following formula can be used:

$$\text{Asset Growth} = [\text{Total assets (t)} - \text{Total assets (t-1)}] / \text{Total assets (t-1)}$$

Research conducted by Isgiyarta, J., & Habsyah Fitri, A. (2020) and Lina, K., Nugraha, & Harpa Sugiharti (2022) shows that asset growth has a significant positive effect on profitability proxied by ROA. Based on this description, the hypotheses that can be proposed in this study are:

H₆: Asset growth has a positive and significant effect on ROA.

RESEARCH MODEL



III. RESEARCH METHODS

This study uses 11 digital banks in Indonesia as research subjects, which consistently publish annual financial reports during the period 2020 to 2024. These banks include: PT Bank Amar Indonesia Tbk, PT Bank Neo Commerce Tbk, PT Allo Bank Indonesia Tbk, PT Bank Jago Tbk, PT Bank Raya Indonesia Tbk, PT Bank DBS Indonesia, PT Bank Seabank Indonesia, PT Bank QNB Indonesia Tbk, PT Bank KEB Hana Indonesia, PT Bank Krom Indonesia Tbk, and PT Bank MNC Internasional Tbk. These banks were selected due to the availability of complete and publicly accessible financial data, thus enabling accurate and thorough quantitative analysis.

The main focus in this study is the profitability of digital banks, which is measured using the ROA indicator. The approach used is quantitative by utilizing secondary data, in the form of financial ratios, loan interest rates, asset growth, and ROA levels obtained from various official sources, such as each bank's annual report, the Financial Services Authority website, Bank Indonesia, and other reliable financial data sources. The sampling technique applied is non-probability sampling, which is a sampling technique that does not provide equal opportunities for the entire population to be selected. The type of method used is purposive sampling, where the

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sample selection is based on certain criteria set by the researcher to ensure suitability with the research objectives.

To analyze the data, the multiple linear regression method was used to measure the extent of the influence of the independent variables namely financial ratios (CAR, BOPO, NPL, LDR), credit interest rates, and asset growth - both simultaneously and partially on the dependent variable, namely digital bank profitability as measured by ROA. Data processing in this study was carried out with the help of SPSS version 30 software.

The multiple regression equation studied is:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \varepsilon$$

Description:

- a. Y = Digital Bank Profitability (measured using ROA)
- b. β_0 = Constant
- c. β_1 = Regression coefficient for CAR variable (X_1)
- d. β_2 = Regression coefficient for BOPO variable (X_2)
- e. β_3 = Regression coefficient for NPL variable (X_3)
- f. β_4 = Regression coefficient for LDR variable (X_4)
- g. β_5 = Regression coefficient for the variable Credit Interest Rates (X_5)
- h. β_6 = Regression coefficient for Asset Growth variable (X_6)
- i. ε = Error component (error term)

IV. RESULT

A. Variable Data

Data on CAR, BOPO, NPL, LDR, Credit Interest Rates and Assets of each bank for the period 2020 to 2024 were collected and processed by performing square root transformation (sqrt) on variables X_3 , X_6 and Y so that there were data affected by outliers. The purpose of this transformation is to make the residuals normally distributed. Ghazali, I.(2018) states that the regression model is said to be good if the residuals are normally distributed, because residual abnormalities can affect the validity of statistical tests such as the t test and F test, especially in small sample sizes.

The data is presented in Table 1 below:

Table 1. Data Variable transformation results to be tested

CAR (X1)	BOPO (X2)	NPL (X3)	LDR (X4)	Credit Interest Rates (X5)	Asset Growth (X6)	ROA (Y)
45,43	96,73	1,22	74,32	13	4,19	0,86
29,85	99,76	0	74,7	13	5,31	0,14
82,52	119,36	0	220,31	13	0	0
119,23	86,07	0	373,61	13	0	2,19
126,31	84,14	1,03	267,68	11,79	3,34	2,42
32,78	96,71	1,63	92,95	14,31	2,41	0,58
55,49	224,01	1,09	52,63	12,09	10,45	0
36,79	127,28	1,43	70,89	11,9	8,59	0
27,86	112,27	0,97	77,73	12,55	0	0
35,3	99,34	0,55	67,53	9,26	0	0,32
19,61	82,23	1,32	86,89	11,48	1,53	1,43
48,81	52,38	0,54	103,49	7,37	8,93	2,18
79,53	60,51	0,1	163,19	11,68	11,74	1,88
84,56	59,87	0,2	150,77	11,91	3,91	2,18
82,58	66,78	0,63	122,69	18,1	3,11	2,12
91,38	261,1	2,21	111,07	14,75	8,06	0
169,92	98,52	0,2	145,86	12,01	21,56	0,32
82,75	99,19	0,74	113,76	11	6,15	0,37
61,77	95,83	0,22	107,77	10,29	5,05	0,7
44,4	92,35	0,45	94,08	8,95	5,83	0,85
24,33	97,12	1,65	84,76	11,39	1,87	0,49
20,24	287,86	0,2	86,01	11,95	0	0
43,74	93,34	0,73	79,13	12,55	0	0,92

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43,84	90,51	1,23	84,21	12,55	0	1,02
44,29	96,68	1,1	87,62	11,54	2,35	0,66
23,26	101,56	1,15	79,54	7,14	0	0
24,1	87,82	0,88	75,07	6,42	0	0,97
23,58	85,45	0,71	75,27	8,02	3,9	1,1
25,16	79,56	0,68	74,68	7,95	3,71	1,44
22,97	83,33	0,64	82,1	9,47	4,6	1,21
51,58	252,47	0,57	93,96	9,38	0	0
41,33	147,03	0,36	73,27	12,06	14,77	0
39,67	98,75	0,36	73,65	12,15	12,49	0,54
34,93	96,13	0,4	85,93	11,93	0	0,99
30,8	93,1	0,41	84,05	11,79	4,75	1,24
24,53	116,14	1,1	97,02	10,25	0	0
29,92	234,5	0,2	80,95	10,25	0	0
38,59	1,35	0,28	91,11	8,47	0	0
62,23	94,53	0,3	93,94	8,86	0	0,69
56,15	88,36	0,84	115,16	6,71	3,06	0,86
26,69	81,03	0,92	119,72	8,7	0	1,16
28,31	85,27	0,77	110,46	6,95	1,16	1,01
26,56	79,24	0,68	120,66	7,5	2,82	1,16
28,35	81,9	0,57	128,27	7,95	0,63	1,16
26,9	82,25	0,53	135,2	8,86	2,7	1,16
94,63	53,27	0,94	221,24	10,45	7,15	2,03
201,57	34,13	0,73	241,98	5,71	8,47	2,27
283,88	31,05	1,36	355	11,91	5,82	1,83
158,06	23,69	2,06	527,91	15,11	3,13	2,26
82,63	17,94	1,77	134,44	10,48	9,1	1,78
15,75	98,09	1,91	77,32	12,72	3,14	0,39
24,31	97,81	1,68	75,61	10,28	4,5	0,42
23,62	88,16	1,49	76,96	9,47	4,51	1,02
31	92,73	1,62	75,68	9,85	2,76	0,84
24,53	95,02	1,58	77,57	9,36	3,87	0,71

B. Classic Assumption Test

The classical assumptions tested include normality test, autocorrelation test, heteroscedasticity test, and multicollinearity test.

1. Normality Test

Based on the Kolmogorov-Smirnov test (K-S Test), the significance value is $0.20 > 0.05$ so that the residuals are normally distributed.

Table 2. One-Sample Kolmogorov-Smirnov Test

				Unstandardized Residual_2	
N				34	
Normal Parameters ^{a,b}		Mean		0,0000000	
		Std. Deviation		0,30206434	
Most Extreme Differences		Absolute		0,107	
		Positive		0,107	
		Negative		-0,086	
Test Statistic				0,107	
Asymp. Sig. (2-tailed) ^c				.200 ^d	
Monte Carlo Sig. (2-tailed) ^e		Sig.		0,405	
		99% Confidence Interval		Lower Bound	0,392
				Upper Bound	0,417

2. Autocorrelation Test

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Based on data processing, the Durbin-Watson value is 1,50, indicating that there is no autocorrelation in the model.

Table 3. Durbin-Watson value

Model Summary ^b					
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	.885 ^a	0,783	0,735	0,33394	1,5
a. Predictors: (Constant), Credit Interest Rates, Asset Growth, BOPO, NPL, CAR, LDR					
b. Dependent Variable: ROA					

3. Heteroscedasticity Test

Based on the Glejser test, the significance value of all independent variables > 0.05, so it can be concluded that there is no indication of heteroscedasticity problems.

Table 4. Glejser Test

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	0,066	0,255		0,259	0,798
	CAR	0,001	0,001	0,229	0,678	0,503
	BOPO	0,002	0,002	0,205	0,808	0,426
	NPL	-0,020	0,073	-0,056	-0,278	0,783
	LDR	0,001	0,001	0,394	1,139	0,265
	Credit Interest Rates	-0,007	0,015	-0,090	-0,478	0,637
	Asset Growth	-0,010	0,011	-0,209	-0,927	0,362

4. Multicollinearity Test

Based on data processing, it can be seen that for all independent variables, the VIF number < 10 and the tolerance value > 0.10. Thus, it can be concluded that the regression model does not have multicollinearity problems.

Table 5. Multicollinearity Test

Model		Collinearity Statistics	
		Tolerance	VIF
1	(Constant)		
	CAR	0,261	3,838
	BOPO	0,460	2,173
	NPL	0,746	1,340
	LDR	0,248	4,030
	Credit Interest Rates	0,835	1,197
	Asset Growth	0,586	1,707
a. Dependent Variable: ROA			

C. Multiple Linear Regression Test

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The statistical analysis used in this study is multiple linear regression. This analysis is used to determine the influence of the independent variables X, namely CAR, BOPO, NPL, LDR, Credit Interest Rates and Asset Growth on the dependent variable Y, namely ROA.

Table 6. Summary of Regression Estimation Results

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	3,267	0,426		7,676	0,000
	BOPO	-0,023	0,004	-0,836	-6,331	0,000
	LDR	0,001	0,001	0,149	0,828	0,415
	Credit Interest Rates	0,033	0,025	0,129	1,320	0,198
	NPL	-0,448	0,121	-0,382	-3,687	0,001
	Asset Growth	-0,042	0,019	-0,260	-2,218	0,035
	CAR	-0,001	0,002	-0,086	-0,487	0,630
a. Dependent Variable: ROA						

From the data processing results, the regression equation is obtained as follows:

$$Y = 3.267 - 0.001X_1 - 0.023X_2 - 0.448X_3 + 0.001X_4 + 0.033X_5 - 0.042X_6$$

D. Hypothesis Test

1. Simultaneous Significance Test (F Test)

The F test is intended to determine the effect of the independent variables, namely CAR, BOPO, NPL, LDR, Credit Interest Rates and Asset Growth simultaneously on the dependent variable ROA of Digital Bank from 2020 to 20

Table 7 F Test Regression Results

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	10,883	6	1,814	16,265	<,001 ^b
	Residual	3,011	27	0,112		
	Total	13,894	33			

From the calculation results in table 4.10 obtained $F_{\text{count}} = 16.264 > F_{\text{table}} = 2.45$ and a significance value of 0.00 which means the significance value < 0.05 . This shows the test results reject H_0 and accept H_a so it can be concluded that CAR, BOPO, NPL, LDR, Credit Interest Rates and Asset Growth simultaneously affect ROA.

2. The t test is intended to determine the partial effect of the independent variables, namely CAR, BOPO, NPL, LDR, Credit Interest Rates and Asset Growth on the dependent variable ROA of Digital Bank from 2020 to 2024 or test the significance of the constant and the dependent variable.

From this t test it is concluded that:

- There is no significant effect of the CAR variable partially on ROA. This is evidenced by the value $|t_{\text{count}}| = 0.487 < t_{\text{table}} = 1.703$ and $t_{\text{count}} < |2|$ and a significance level $= 0.630 > 0.05$ so that H_0 is accepted and H_1 is rejected.
- There is a significant effect of the BOPO variable partially on ROA. This is evidenced by the value $|t_{\text{count}}| = 6.331 > t_{\text{table}} = 1.703$ and $t_{\text{count}} > |2|$ and a significance level $= 0.001 < 0.05$ so that H_0 is rejected and H_2 is accepted.
- There is a significant effect of the NPL variable partially on ROA. This is evidenced by the value $|t_{\text{count}}| = 3.687 > t_{\text{table}} = 1.703$ and $t_{\text{count}} > |2|$ and a significance level $= 0.001 < 0.05$ so that H_0 is rejected and H_3 is accepted.

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- d. There is no significant effect of the LDR variable partially on ROA. This is evidenced by the value $|t_{\text{count}}| = 0.828 < t_{\text{table}} = 1.703$ and $t_{\text{count}} < |2|$ and a significance level $= 0.415 > 0.05$ so that H_0 is accepted and H_4 is rejected.
- e. There is no effect of the Credit Interest Rate variable partially on ROA. This is evidenced by the value $|t_{\text{count}}| = 1.320 < t_{\text{table}} = 1.703$ and $t_{\text{count}} < |2|$ and a significance level $= 0.198 > 0.05$ so that H_0 is accepted and H_5 is rejected.
- f. There is a positive and significant effect of the Asset Growth variable partially on ROA. This is evidenced by the value $|t_{\text{count}}| = 2.218 > t_{\text{table}} = 1.703$ and $t_{\text{count}} > |2|$ and a significance level $= 0.035 < 0.05$ so that H_0 is rejected and H_6 is accepted.

V. DISCUSSION OF RESEARCH RESULTS

1. Effect of CAR on ROA

The regression results show that CAR has a negative and insignificant effect on ROA, indicating that the capital owned by digital banks in the 2020-2024 period has not contributed significantly to profitability. Although in theory strong capital should increase resilience and opportunities for credit expansion, in practice the capital has not been optimally utilized, possibly due to a cautious expansion strategy or limited viable financing projects. This study is in line with research conducted by Arsew, V. T., Kisman, Z., & Sawitri, N. N. (2024), and Nana Safitri et al. (2024), which showed that CAR has a negative effect on ROA. It also aligns with the research conducted by Brock & Rojas Suarez (2000), Wisnu Mawardi (2005), Dumeric, M., & Ridzak, T. (2013), Wahyudi, C., & Kartikasari, M. D. (2021), Nurhanna R. A., & Sahabudin S. (2022), and Ariska, A.S., & Suryakusuma, K. H. (2024) found that CAR does not have a significant effect on ROA.

2. Effect of BOPO on ROA

BOPO has a significant negative effect on ROA, which means that high operating expenses relative to income will reduce bank profitability. This finding emphasizes the importance of operational efficiency, as digital banks that are unable to manage costs well will face declining profits. Therefore, controlling costs and improving efficiency are key strategies to maintain profitability. These results are supported by research conducted by Afanasief et al. (2004), Saputra, M. A., & Lian, F. (2018), Ponttie Prasnanugraha (2007), Zulvia, Y. (2020), Sofyan, M. (2020), Arsew, V. T., Kisman, Z., & Sawitri, N. N. (2024), Ariska, A.S., & Suryakusuma, K. H. (2024), Chinthia Cahya Mega, et al. (2024), and Bambang Jatmiko (2025) found that BOPO has a negative and significant effect on ROA.

3. Effect NPL on ROA

NPL has a significant negative effect on ROA, indicating that an increase in non-performing loans reduces bank profitability. This finding indicates potential weaknesses in credit analysis or risk mitigation at digital banks. High NPLs reduce interest income and increase provisioning costs, which ultimately weighs on profit performance. Several empirical studies also show consistent results. Wahyudi, C., & Kartikasari, M. D. (2021), Sahyuni, S., et al. (2021), Meiky T. T, et al. (2019), and Basran Desfian (2005) found that NPL has a negative and significant effect on ROA.

4. Effect LDR on ROA

LDR has a negative but insignificant effect on ROA, indicating that lending has not consistently increased the profitability of digital banks. This could be due to low lending efficiency, small profit margins, or high credit risk. Although a high LDR reflects an increased intermediation function, without optimal management, this does not necessarily have a positive impact on profits. This study is supported by research conducted by Vodova (2012), Madjit et al. (2022), Ariska, A.S., & Suryakusuma, K. H. (2024), and Asri Safira, A., & Suryakusuma Kholid H. (2024), which indicate that LDR partially has a positive and significant effect on ROA.

5. Effect of Credit Interest Rate on ROA

Credit interest rates have a positive but insignificant effect on ROA, indicating that changes in interest rates have not had a real impact on the profitability of digital banks. While in theory it could increase revenue, the effect could be tempered by a decrease in loan demand or an increase in default risk. Digital banks may keep interest rates competitive or adjust for risk, so the impact on profits is limited. This study is in line with research conducted by Muhamad Tofan, et al. (2022), which shows that interest rates have a negative effect on banking profitability.

6. Effect of Asset Growth on ROA

Asset growth has a negative and significant effect on ROA, but its effectiveness depends on its allocation. If asset growth is not followed by an increase in operating income, this could reflect suboptimal asset utilization. Therefore, digital banks need to direct asset growth to productive sectors that support increased profits. The results of this study contradict those of Isgiyarta, J., & Habsyah Fitri, A. (2020) and Lina, K., Nugraha, & Harpa Sugiharti (2022), who stated that there is a positive and significant effect of asset growth on ROA.

7. The most dominant variable affecting ROA

BOPO variable is the most dominant variable affecting ROA in digital banks because it has the largest standardized beta coefficient value in absolute terms (-0.836).

VI. CONCLUSION

1. Simultaneous Effect

The six independent variables - CAR, BOPO, NPL, LDR, Credit Interest Rates, and Asset Growth jointly have a significant effect on ROA, as indicated by a significance value of $0.00 < 0.05$. This indicates that the regression model as a whole is able to explain variations in digital bank profitability.

2. Partial Effect

- a. CAR has a negative but insignificant effect on ROA, indicating that increasing capital has not had a direct impact on profitability.
- b. BOPO has a negative and significant effect, indicating that high operating costs suppress profits, so efficiency is an important factor.
- c. NPL also has a negative and significant effect, reflecting that high non-performing loans reduce profitability, so credit risk control is needed.
- d. LDR has a positive but insignificant effect on ROA; lending has not shown a strong impact on profits.
- e. Credit interest rates show a positive but insignificant effect, indicating that the increase in interest rates has not had a real impact on increasing profits.
- f. Asset growth has a negative and significant effect on ROA, indicating that the increase in assets has not been followed by efficiency that supports profitability, so more effective asset management is needed.

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