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Determinant Factors Analysis of Bank Profitability: Study On Indonesian Banks Period 2019-2022

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Abstract

The banking sector is one of the most important financial institutions in the Indonesian economy. Banks are the significant driver of economic growth by delivering capital toward productive investments. Thus, banks must be profitable to continue operating and support economic growth. This study investigates the relationship between bank-specific determinants of Bank Size (SIZE), Capital Adequacy Ratio (CAR), Loan Deposit Ratio (LDR), Operating Cost to Operating Income (OCOI), and Non-Performing Loans (NPL) toward Bank Profitability measured by Return on Asset (ROA). The research uses data from 10 Indonesian banks in KBMI 3 and 4 categories from 2019 – 2022. Classical assumption tests are run to ensure the data is considered BLUE. The study used Fixed Effect Model panel data regression. The research results show that CAR has a positive insignificant relationship toward ROA while LDR has a positive significant relationship toward ROA. In contrast, SIZE, OCOI, and NPL have a negative significant relationship toward ROA. Due to the SIZE, LDR, OCOI, and NPL showing a significant relationship with ROA, this study recommends that bank management pay more attention to these variables to maintain the banks' ROA.

Keywords: Banking, Capital Adequacy Ratio, Loan To Deposit Ratio, Operating Cost to Operating Income, Panel Data Regression.

A. INTRODUCTION

The banking sector is crucial for every country in advancing economic development (Al-abedallat, 2017). Banks significantly direct public savings toward profitable projects that promote economic growth (Aziz et al., 2016) and facilitate the productive use of surpluses to generate employment, promote economic welfare, and provide risk-free income to depositors (Drigă & Dura, 2014). In other words, banks contribute significantly to a country's investment and consumption.

The inadequate financial sector, particularly its critically undercapitalized and poorly regulated banks, was Indonesia's worst weakness that may lead to an economic crisis (Sharma, 2001). Indonesia has faced economic crises such as the 1997 economic crisis. Several factors, including weak banks, triggered the 1997 economic crisis. At that time, the banks were flawed and poorly regulated. Therefore, the vital role of banks in the economy should be a concern for the bank management, stakeholders, and government to ensure the banking sector performs well to support economic growth and avoid economic crises in the future.

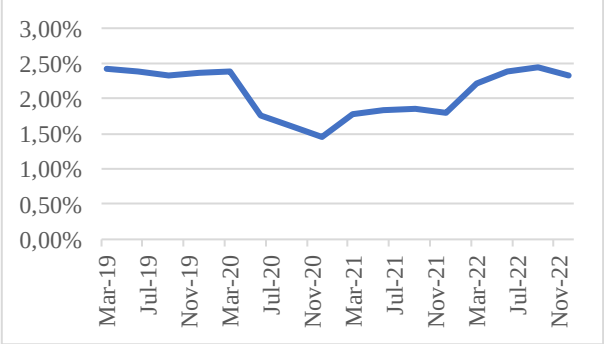

Figure 1. Average Bank ROA (%) 2019 – 2022
Source: Research Data, 2023

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COVID-19 began to emerge in December 2019 and continued to spread rapidly all over the globe, posing a serious risk to economic growth and public health (Zhou et al., 2021). In March 2020, the Indonesian government announced the first COVID-19 case in the country, marking the virus's entry into Indonesia and soon becoming a national issue. COVID-19 has had multi-sectoral impacts, including disrupting the economy. These COVID-19 pandemic events affected banks. Figure 1.1 shows the average return on assets of 10 Indonesian banks in 2019-2022. It shows a decrease in ROA starting in March 2020, when COVID-19 entered Indonesia.

Previous studies found that bank size, capital adequacy ratio, loan-to-deposit ratio, operating cost to operating, and non-performing loan income affect bank profitability. This paper attempts to identify these determinants and understand their relationship to a bank's profitability so that banks can continue to operate and support economic growth.

Bank Performance Measurement

According to Act Number 10 of 1998 on Banks, banks are entities that collect funds from the public in the form of deposits and distribute them to the public in the form of credit and/or other forms in order to enhance the quality of life for the general public (BPK, n.d). Based on their core capital, banks are divided into four groups. These groups are regulated by POJK number 12/POJK.03/2021 on Commercial Banks after the Financial Services Authority (OJK) changed the regulations for grouping banks from Bank Umum Kelompok Usaha (BUKU) to Kelompok Bank Berdasarkan Modal Inti (KBMI).

ROA is a financial metric that provides insight into a company's profitability concerning its total assets. It measures how well a business uses its assets to make profits (Hargrave, 2023). ROA shows the profit made per Rupiah of assets. According to (Hassan & Bashir, 2005), ROA reveals the management's ability to utilize the bank's financial and real investment resources to increase profits.

Bank Performance Factors

Several factors can influence bank performance:

1. Bank Size (Size): Size is determined by its total assets. This ratio shows the assets ownership of the bank. SIZE can be calculated using the natural logarithm of the bank's total assets. Banks with high amounts of assets can offer more financial services, opening new possibilities for income. Large-size banks can be more profitable by realizing economies of scale (Regehr & Sengupta, 2016);
2. Capital Adequacy Ratio (CAR): CAR compares the amount of a bank's capital to its risk-weighted assets (Hayes, 2023). It indicates the ability of a bank to fulfill its obligations and absorb losses. The two types of capital that are measured are Tier-1 capital, which is the amount of capital that a bank has on hand to cover losses so that it can keep operating, and Tier-2 capital, which is the amount of capital that will be available from the sale of assets if it fails.
3. Loan to Deposit Ratio (LDR): LDR is a ratio of total loans the bank gives to its total deposit. This measures the proportion of credit-based funding from third parties. The LDR is used as a measurement of liquidity. LDR demonstrates a bank's capacity to cover loan losses and customer withdrawals (Murphy, 2023). A higher LDR means the bank uses more deposits for potential loans to generate income but faces higher risk. In contrast, a lower rate means the bank has more unproductive capital and may not earn as much as it could be.
4. Operating Cost to Operating Income (OCOI): OCOI is a ratio of operating expenses divided by operating income. This ratio assesses how efficiently the company generates profits concerning its operating expenses. (Hayes, A., 2022). A higher OCOI means the bank is more inefficient at managing operating costs to generate income. In contrast, a lower rate means the bank is more efficient.
5. Non-performing Loan (NPL): NPL is a ratio of default loans to total loans. This ratio measures a bank's credit risk (Çollaku & Aliu, 2021). According to (Basel Committee, 2000), credit risk is the potential risk of loss due to the bank borrower's failure to meet its obligations in accordance with agreed terms. Banks are exposed to credit risk due to the primary activity of lending loans to borrowers in need of capital. Higher NPL means the bank has a higher percentage of loans not being repaid accordingly, signaling financial trouble. Lower NPL indicates that the borrower repays higher bank loans, bringing income for the bank. The formula of NPL is shown below:

Previous Study

(Rohman et al., 2022) studied the impact of bank-specific determinants on bank profitability of 43 Indonesian banks listed in IDX from 2019 – 2020. They found that SIZE and LDR have a positive insignificant

influence on ROA while CAR and NPL have a negative significant influence. (Chandra & Widyarini, 2021) studied the impact of bank-specific determinants on bank profitability of 7 Indonesian banks in BUKU IV category over 2019 – 2020. They found that CAR positively influences ROA, while LDR, OCOI and NPL have a negative influence. (Rahmi & Sumirat, 2021) studied the impact of bank-specific determinants on the profitability of commercial banks in Indonesia from January 2020 – September 2020. They found that CAR and OCOI have a negative significant influence on ROA while LDR has a positive significant influence.

(Supriyono & Herdhayinta, 2019) studied the impact of bank-specific determinants on bank profitability of regional development banks in Indonesia from 2011 – 2015. They found that SIZE, LDR and NPL positively influence ROA, while CAR and OCOI negatively influence it. (Anggono, H., 2017) studied the impact of bank-specific determinants on bank profitability of 17 Indonesian banks from 2008 – 2013. He found that CAR and LDR have a positive significant influence on ROA.

(Petria, et al., 2015) studied the impact of bank-specific determinants on bank profitability of EU27 banks over the period 2004 – 2011. They found that SIZE and CAR positively influence ROA while LDR and NPL negatively influence. (Rahman, et al., 2015) studied the impact of bank-specific determinants on bank profitability of Bangladesh banks from 2006 – to 2013. They found that SIZE and CAR positively influence ROA while NPL has a negative significant influence. (Ongore & Kusa, 2013) studied the impact of bank-specific determinants on the profitability of commercial banks in Kenya from 2001 – 2010. They found that CAR and LDR positively influence ROA while NPL has a negative significant influence.

Conceptual Framework and Hypothesis

The conceptual framework regarding the relationship between bank-specific determinants as independent variables (X) and bank profitability as dependent variables (Y) can be seen in Figure 2.1.

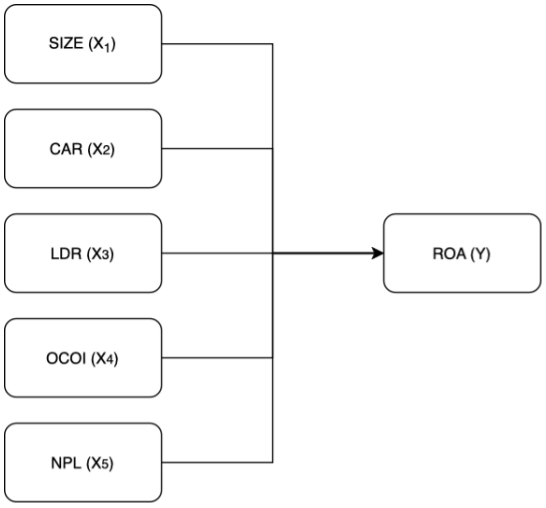

Figure 2. Conceptual Framework
Source: Research Data, 2023

Based on the conceptual framework and previous studies, the author developed several hypotheses regarding the bank profitability determinants:
H_1: SIZE has a positive and significant effect on ROA.
H_2: CAR has a positive and significant effect on ROA.
H_3: LDR has a positive and significant effect on ROA.
H_4: OCOI has a positive and significant effect on ROA.
H_5: NPL has a positive and significant effect on ROA.

B. RESEARCH METHODS

This study's population comprises commercial banks registered with the Financial Services Authority (OJK) between 2019 and 2022. The data samples were selected using purposive sampling, in which the banks

used as samples for this research were selected based on specific criteria. These are the selection criteria for the sample used in this research: 1) Conventional banks (practice lending and borrowing money based on interest); 2) Has published quarterly reports for the 2019 – 2022 period; and 3) Core (Tier 1) capital greater than 14 trillion rupiahs at the end of 2022. This research uses secondary data. ROA, SIZE, CAR, LDR, OCOI, and NPL data are extracted from quarterly financial reports Financial Services Authority (OJK) provided from Q1 2019 – Q4 2022 on its website (ojk.go.id).

The study used data from financial reports of ten Indonesian conventional banks in the KBMI 3 and KBMI 4 categories. These banks are chosen based on their large amount of capital compared to other Indonesian banks and represent most of the banking sector. The research data are taken from bank financial reports provided by the Financial Services Authority on its website (ojk.go.id) for Q1 2019 – Q4 2022.

The research uses ROA as the dependent variable and five independent variables, including SIZE, CAR, LDR, OCOI and NPL.

Table 1. Variables Formula

Variable	Acronym	Description	Formula
Return on Asset	ROA	The ratio of net income to total assets	$\frac{Net\ Income}{Total\ Assets}$
Bank Size	SIZE	Natural logarithm of total assets	$\ln(Total\ Assets)$
Capital Adequacy Ratio	CAR	The ratio of capital to risk-weighted assets	$\frac{Tier\ 1 + Tier\ 2\ Capital}{Risk\ Weighted\ Assets}$
Loan to Deposit Ratio	LDR	Ratio of loans lend to total deposit	$\frac{Total\ Credit}{Total\ Third\ Party\ Funds}$
Operating Cost to Operating Income	OCOI	Bank's efficiency in gaining profit	$\frac{Total\ Operating\ Cost}{Total\ Operating\ Income}$
Non-performing Loan	NPL	The ratio of default loans to total loans	$\frac{Non\ Performing\ Loan}{Total\ Credit}$

Source: Processed Data, 2023

Analysis Technique

First, classical assumption tests ensure the data is considered BLUE. The best linear unbiased estimator (BLUE) is the estimator that minimizes the variance of the sampling distribution subject to the condition that it is unbiased (Davidson & Mackinnon, 1993). BLUE regression models pass classical assumption tests. The tests include normality, multicollinearity, heteroscedasticity, autocorrelation, stationary and linearity.

Secondly, panel data combines cross-sectional and time series data (Brugger, 2021). By accumulating data from multiple instances of the same object over time, panel data combines both characteristics into a single model. Panel data give larger data points, more degrees of freedom, less collinearity among the variables, and more efficiency (Hsiao, 2003). Thirdly, The Chow test, Hausman test, and Lagrange Multiplier are three distinct methods for selecting the best panel data estimation model between Pooled OLS, Fixed Effect and Randon Effect Model.

Fourth, statistical tests are used in the research to determine the variable's significance and proportion of variance explained. The tests included F-test, T-test, and Coefficient of Determination.

This study attempts to assess the profitability of banks in Indonesia as measured by ROA using the following model equation:

$$ROA_{i,t} = \alpha + \beta_1 SIZE_{i,t} + \beta_2 CAR_{i,t} + \beta_5 NPL_{i,t} + \beta_4 OCOI_{i,t} + \beta_3 LDR_{i,t} + \varepsilon_{i,t}$$

Where:
$ROA_{i,t}$: Return on Asset for firm *i* in period *t*
$SIZE_{i,t}$: Natural Logarithm of Total Assets for firm *i* in period *t*
$CAR_{i,t}$: Capital Adequacy Ratio for firm *i* in period *t*
$NPL_{i,t}$: Nonperforming Loan for firm *i* in period *t*
$OCOI_{i,t}$: Operating Cost to Operating Income for firm *i* in period *t*
$LDR_{i,t}$: Loan to Deposit Ratio for firm *i* in period *t*

α : Constant
β : Coefficient
e : Error Term for firm i in period t

C. RESULTS AND ANALYSIS

Classical Assumption Test

Normality Test

The author employs Jarque-Bera for the normality test. The outcome is displayed in Figure 4.1.

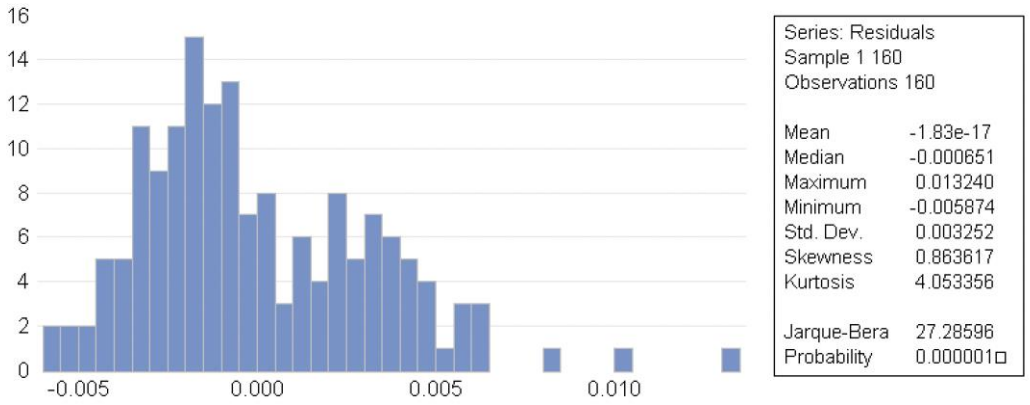

Figure 3. Normality test result
Source: Research Data, 2023

The figure shows that the Jarque-Bera value is 27.29, greater than the model's Chi-square (18.31). This indicates that the data is not normally distributed. Several methods are taken to normalize the data using three types of data smoothing: Single, Double, and Holt-Winters. All three data smoothing methods do not make the data normally distributed. However, according to (Gujarati & Porter, 2009), the normality assumption might not be crucial in large datasets (above 100) due to many observations. Thus, the author can proceed with the data.

Multicollinearity Test

The author uses the Coefficient of Determination for the multicollinearity test. The outcome is displayed in Table 2.

Table 2. Multicollinearity Test Result

	SIZE	CAR	LDR	OCOI	NPL
SIZE	1	-0.312673	-0.212596	-0.544801	-0.232457
CAR	-0.312673	1	-0.382227	-0.096375	-0.078700
LDR	-0.212596	-0.382227	1	0.411203	0.373234
OCOI	-0.544801	-0.096375	0.411203	1	0.660825
NPL	-0.232457	-0.078700	0.373234	0.660825	1

Source: Research Data, 2023

The result shows that all independent variables' absolute coefficient correlation is smaller than 0.8. This indicates that the independent variables are not multicollinear.

Heteroscedasticity Test

The author employs the White test for the heteroscedasticity test. The outcome is displayed in Table 3.

Table 3. Heteroscedasticity Test Result

F-statistic	1.657569	Prob. F(20,139)	0.0478
Obs*R-squared	30.81138	Prob. Chi-Square(20)	0.0577

Scaled explained SS	43.57727	Prob. Chi-Square(20)	0.0017

Source: Research Data, 2023

The result shows that the probability of Obs*R-squared (0.0577) is greater than 0.05. This demonstrates that there is no heteroscedasticity in the data.

Autocorrelation Test

The author uses the Breusch-Godfrey test for the autocorrelation test. The result is shown in Table 4.

Table 4. Autocorrelation Test Result

F-statistic	145.5607	Prob.F(2,152)	0.0000
Obs*R-squared	105.1166	Prob.Chi-Square(2)	0.0000

Source: Research Data, 2023

The table shows that the Obs*R-squared (0.00) probability is smaller than 0.05. This demonstrates that there is autocorrelation. To account for the autocorrelation problem, the author will use the generalized least-square (GLS) method (Gujarati, 2009).

Stationary Test

Table 5. Level Stationary Test Result (ROA)

Method	Prob.
Levin, Lin & Chu t*	0.0034**
Im, Pesaran and Shin W-stat	0.0134**
ADF – Fischer Chi-square	0.0322**
PP – Fischer Chi-square	0.0888

Source: Research Data, 2023

The level stationary test result of ROA shows that 3 out of 4 tests show the p-value is smaller than 0.05, indicating that ROA has no unit root (stationary). However, the stationary test result of independent variables shows that the variables have unit roots (nonstationary). To account for the nonstationary problems, the author will use the first difference stationary test, and the results show that all independent variables are stationary.

Table 6. 1st Difference Stationary Test Result (SIZE)

Method	Prob.
Levin, Lin & Chu t*	0.0000**
Im, Pesaran and Shin W-stat	0.0000**
ADF – Fischer Chi-square	0.0000**
PP – Fischer Chi-square	0.0000**

Source: Research Data, 2023

The first difference stationary test result of SIZE shows that 4 out of 4 tests show the p-value is smaller than 0.05, indicating that SIZE has no unit root (stationary).

Table 7. 1st difference Stationary Test Result (CAR)

Method	Prob.
Levin, Lin & Chu t*	0.0000**
Im, Pesaran and Shin W-stat	0.0000**
ADF – Fischer Chi-square	0.0000**
PP – Fischer Chi-square	0.0000**

Source: Research Data, 2023

The first difference stationary test result of CAR shows that 4 out of 4 tests show the p-value is smaller than 0.05, indicating that CAR has no unit root (stationary).

Table 8. 1st difference Stationary Test Result (LDR)

Method	Prob.
Levin, Lin & Chu t*	0.0077**
Im, Pesaran and Shin W-stat	0.0025**
ADF – Fischer Chi-square	0.0066**

Method	Prob.
PP – Fischer Chi-square	0.0000**

Source: Research Data, 2023

The first difference stationary test result of LDR shows that 4 out of 4 tests show the p-value is smaller than 0.05, indicating that LDR has no unit root (stationary).

Table 9. 1st Difference Stationary Test Result (OCOI)

Method	Prob.
Levin, Lin & Chu t*	0.0000**
Im, Pesaran and Shin W-stat	0.0000**
ADF – Fischer Chi-square	0.0000**
PP – Fischer Chi-square	0.0000**

Source: Research Data, 2023

The first difference stationary test result of OCOI shows that 4 out of 4 tests show the p-value is smaller than 0.05, indicating that OCOI has no unit root (stationary).

Table 10. 1st Difference Stationary Test Result (NPL)

Method	Prob.
Levin, Lin & Chu t*	0.0000**
Im, Pesaran and Shin W-stat	0.0000**
ADF – Fischer Chi-square	0.0000**
PP – Fischer Chi-square	0.0000**

Source: Research Data, 2023

The first difference stationary test result of NPL shows that 4 out of 4 tests show the p-value is smaller than 0.05, indicating that NPL has no unit root (stationary).

Linearity Test

The author uses the Ramsey RESET test. Table 4.16 shows the results of linearity tests.

Table 11. Linearity Test Result

Test	Probability
t-statistic	0.3378
F-statistic	0.3378
Likelihood ratio	0.3262

Source: Research Data, 2023

The result shows that all indicators' (t-statistic, F-statistic and likelihood ratio) p-values are greater than 0.05. This indicates that the relationship between variables is linear.

Panel Data Model Selection Result

The author uses the Chow test as the first method to choose the appropriate regression model.

Chow Test

The regression model selection started with the Chow test. The outcome is displayed in Table 12.

Table 12. Chow Test Result

Effect Test	Statistic	d.f.	Prob.
Cross-section F	26.830134	(9,145)	0.0000

Source: Research Data, 2023

The finding in Table 12 shows that the probability of Cross-section F (0.00) is smaller than 0.05. Hence, the null hypothesis is rejected and followed by the Hausman Test to compare Random and Fixed Effects.

Hausman Test

After the Chow test, the author uses the Hausman test as the second method to choose the appropriate regression model. The outcome is displayed in Table 13.

Table 13. Hausman Test Result

Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	19.925115	5	0.0013

Source: Research Data, 2023

The result in Table 4.18 demonstrates that the probability of Cross-section random (0.0013) is smaller than 0.05. Consequently, the null hypothesis is rejected, and the Fixed Effect Model is selected for the research.

Hypothesis Testing

Hausman's test result suggests that the Fixed Effect Model is the most suitable model for this research. Due to the autocorrelation problem, a Generalized Least Square will be used. Thus, this research uses the Fixed Effect GLS method for the regression of panel data.

Table 14. Panel Data Regression Result

Variable	Coefficient	Prob.	Significance
C	0.293205	0.0000	Significant
SIZE	-0.011304	0.0000	Significant
CAR	0.004213	0.3888	Not significant
LDR	0.010454	0.0000	Significant
OCOI	-0.069008	0.0000	Significant
NPL	-0.175573	0.0000	Significant
Weighted Statistics			
R-squared	0.971238		
Prob(F-statistic)	0.000000		

Source: Research Data, 2023

The results show the significant effect of four independent variables (SIZE, NPL, OCOI, and LDR) on the dependent variable. However, CAR is not significant towards the dependent variable. This finding also suggests a substantial impact of all the independent variables collectively on the dependent variable. The independent variables explain 97.1% of the variation in the dependent variable.

Table 15. Hypotheses Result

Variables	Findings	Result
Bank Size	SIZE has a negative and significant impact on ROA	Rejected
Capital Adequacy Ratio	CAR has a positive and insignificant impact on ROA	Rejected
Loan to Deposit Ratio	LDR has a positive and significant impact on ROA	Accepted
Operating Cost to Operating Income	OCOI has a negative and significant impact on ROA	Accepted
Non-performing Loan	NPL has a negative and significant impact on ROA	Accepted

Source: Research Data, 2023

Regression Model

Based on the regression result, it can be inferred that the regression model is:

ROA = 0.293204811023 - 0.011304090691*SIZE + 0.00421344791854*CAR + 0.010453580244*LDR - 0.0690077366249*OCOI - 0.175572612246*NPL

Bank Size

The regression result shows that SIZE negatively and significantly affects ROA with a coefficient of -0.0113. This does not follow any previous research from the literature review. The result means that the bigger the bank's total assets, the smaller the bank's profitability. Based on the quarterly financial data, the bank's total assets always increase from 2019 – 2022. Decreasing return on assets and increasing total assets means that the banks' net income decreases. The decrease in net profit might be caused by the COVID-19 pandemic, which causes economic problems for households and businesses, decreasing their revenue and making it challenging for them to pay their loans to banks and causing an increase in non-performing loans for banks.

Capital Adequacy Ratio

The regression result indicates that CAR has a positive and insignificant effect on ROA with a coefficient of 0.0042. The finding aligns with the prior study conducted by Rahman (2015). The finding means that the higher the capital adequacy ratio, the higher the bank's profitability is. A higher capital adequacy ratio means banks have more capital to fulfill obligations and absorb losses, thus allowing them to enlarge their business activities to earn more potential income.

Loan to Deposit Ratio

The regression result shows that LDR positively and significantly affects ROA with a coefficient of 0.0105. The result follows previous research (Anggono, H., 2017). The result means that the higher the loan-to-deposit ratio, the higher the bank's profitability is. A higher loan-to-deposit ratio means a higher percentage of funds lent by the banks, thus allowing banks to reap greater profits as long as the bank maintains good lending procedures.

Operating Cost to Operating Income

The regression result indicates that OCOI has a negative and significant effect with a coefficient of -0.0690. The findings align with the prior study (Rahmi & Sumirat, 2021). A higher operating cost to operating income means a higher percentage of operating expenses relative to the income generated from operating activities, indicating that banks are less efficient due to using larger capital to gain income from operational activities.

Non-performing Loan

The regression result shows that NPL negatively and significantly affects ROA with a coefficient of -0.1756. The finding means that the higher the non-performing loan, the lower the bank's profitability is. The findings align with the prior study (Petria, 2015). A higher non-performing loan means a higher percentage of loans in which the borrower is in default and hasn't made any scheduled payments of principal or interest for a certain period, indicating that the bank is losing more potential profits and suffered losses due to defaulted loans.

Intercept Analysis

Intercept analysis is used to understand the baseline level of bank profitability. The purpose of intercept analysis is to assess the relative standing of a bank within the industry by conducting a comparative evaluation of its performance against that of other competitors using constant or zero independent variables.

Table 16. Intercept Analysis Result

Bank	Constant (C)	Bank Intercept (BI)	Fixed Effect Intercept (C + BI)	Rank
Bank Rakyat Indonesia	0.293205	0.020332	0.313537	1
Bank Central Asia	0.293205	0.012440	0.305645	2
Bank Mandiri	0.293205	0.012222	0.305427	3
Bank Negara Indonesia	0.293205	0.006834	0.300039	4
Bank CIMB Niaga	0.293205	-0.003020	0.290185	5
Bank Tabungan Negara	0.293205	-0.005011	0.288194	6
Bank Danamon	0.293205	-0.009574	0.283631	7
Bank Pan Indonesia	0.293205	-0.010748	0.282457	8
Bank Permata	0.293205	-0.011196	0.282009	9
Bank OCBC NISP	0.293205	-0.012279	0.280926	10

Source: Research Data, 2023

D. CONCLUSIONS

This research examines the determinants of bank performance using the ROA ratio for the KBMI 3 and 4 categories banks in Indonesia during the 2019-2022 quarterly period. The data is processed with panel data regression using the fixed-effects model and valid to the classical assumption test. The result shows that bank profitability determinants of LATA, TPFTA, NPLTL, OCOI, and TIER1TA significantly affect bank profitability of ROA. Some variables show similar expected results with the hypothesis, which are LDR, OCOI and NPL; meanwhile, some variables show different expected results with the hypothesis: SIZE and CAR.

From the research findings, banks should increase their loan ratio, increase operating efficiency and reduce the amount of non-performing loans to increase the bank's profitability. More research about bank size needs to be done, and the bank has to maintain the capital adequacy ratio according to the banking law. This research is limited to 10 Indonesian banks in the KBMI 3 and 4 categories for 2019-2022. Further research may use more banks from KBMI 3 and other KBMI categories and cover extended periods and different frequencies to get more accurate results.

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