

Key Performance Indicators Influencing Bank Profitability: an Empirical Analysis

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Abstract—This study investigates the key performance indicators influencing the profitability of 47 Indonesian banks listed on the Indonesia Stock Exchange from 2019 to 2023. Employing purposive sampling, the research compares the performance of 9 public and 38 private banks, analyzing the impact of bank-specific factors such as size, debt, capital adequacy, loan risk and macroeconomic variables include inflation and interest rates on profitability metrics. Findings reveal that loan risk, debt, and size positively influence ROA for all banks and private banks, while larger banks experience shrinking NIM. Public banks benefit from strong capital adequacy and debt levels, leading to improved NIM. Notably, interest rate hikes positively impact ROA, ROE, and NIM across all banks, highlighting the role of higher lending returns in enhancing profitability. However, increased bank size negatively affects NIM, suggesting potential inefficiencies in scaling operations. Public banks with robust capital adequacy experience significant NIM growth, indicating investor preference for well-capitalized institutions. This study provides a nuanced understanding of the complex interplay between bank-specific and macroeconomic factors shaping Indonesian bank profitability, emphasizing the distinct impacts on public and private institutions and contributing valuable insights to the existing literature.

Keywords—*Bank-Specific Factors; Macroeconomic Factors; Profitability*

I. INTRODUCTION

The banking sector is a crucial pillar in the economy of a country, including Indonesia. Banking not only functions as a financial intermediary bridging parties with surplus funds and those in need of funds, but also serves as a key driver in the efficient allocation of economic resources. Through its financial intermediation function, banks are able to gather funds from the public in the form of savings and redistribute them as loans to individuals, companies, and the government. This process not only helps to drive the economy but also fosters innovation, job creation, and infrastructure development. As the largest economy in Southeast Asia, Indonesia's banking system continues to transform in response to global and local economic changes. Globalization and advancements in information technology have brought significant changes to how banks operate and interact with customers.

One of the key indicators used to evaluate a bank's performance is profitability. Bank profitability is a major concern for stakeholders as it not only reflects the health of individual institutions but also impacts monetary stability and economic development [1]. Profitability not only indicates a bank's ability to generate profits but also reflects its stability, trustworthiness, and capacity to survive and grow in a dynamic and complex competitive environment. High profitability indicates promising prospects for the company, attracting investors to its shares. To achieve and maintain optimal profitability, banks need to consider several factors that can influence their performance. These factors include bank-specific factors such as size, total debt, capital adequacy ratio (CAR), loan-to-deposit ratio (LDR), as well as macroeconomic factors like the inflation rate and interest rates. This is supported by previous researchers in studies related to the profitability of the bank.

The regression analysis of bank-specific factors indicates that, in private banks, there is a positive correlation between credit risk and debt with ROA. This is consistent with findings by [2] and [3], which

suggest that these banks benefit from higher interest income and potential for better risk management in lending practices. Interestingly, large banks show a positive relationship with ROA and ROE, indicating that economies of scale play an important role in enhancing equity-based profitability. These results align with the research conducted by [4] and [5]. The study by [6] and [7] shows that the size variable has a positive and significant impact on banking profitability (ROE).

Conversely, larger bank size negatively impacts NIM, reflecting decreased efficiency or increased competition that suppresses interest income [8]. For government banks, strong capital adequacy ratios and higher NIM indicate better stability and the ability to withstand financial shocks, thus improving investor confidence and performance. These findings support the empirical findings of [9]. The study by [10] shows that CAR has a positive and significant impact on banking profitability. These results are consistent with the research conducted by [11], which states that CAR positively and significantly affects banking profitability in Indonesia. The study by [12] indicates that CAR and LDR positively influence the profitability of banking companies listed on the Indonesia Stock Exchange (IDX). Furthermore, the research by [13] shows that CAR positively affects ROA, while LDR does not have an impact on ROA.

The exploration of macroeconomic factors conducted in this study reveals that higher interest rates have a positive impact on ROA and ROE across the sector, indicating that a high interest rate environment creates opportunities for banks to increase their lending margins and profitability [14]. These findings underscore the sensitivity of banking performance to changes in macroeconomic policy and market interest rates, thus reinforcing the inherent linkage between economic conditions and the sustainability of the banking sector. Surprisingly, the analysis of both government and private banks shows that inflation does not affect bank profitability. This result is supported by [9]. The research by [15] also indicates that inflation has a negative and significant impact on ROA. According to the study by [6], the variables of interest rate and inflation have a small but insignificant impact on profitability. This is understandable, as all banks listed on the IDX already have strong financial positions. A bank with a strong financial position may have the resilience to withstand the erosion of the real value of money due to inflation without a significant impact on its profitability.

Literature Review and Hypothesis Development

Profitability

Profitability is a crucial measure of a company's financial performance, reflecting its ability to generate profit through effective management of assets, sales, and cost control. [14], profitability is the ability of a company to generate profit over a certain period using its resources. Important aspects illustrated by profitability include demonstrating how efficiently the company manages its resources, indicating the company's ability to generate profit, showing the company's stability and ability to endure in the long term, reflecting the effectiveness of management in making strategic and operational decisions, illustrating the company's capacity to sustain and grow, and serving as a performance assessment tool for both internal and external parties such as investors, creditors, and financial analysts [16].

Bank Size

Bank size is one of the indicators used to measure the scale of a bank and is assessed using the total assets owned by the bank. According to [7], bank size can be measured by the amount of assets, the number of branches, the number of customers, and capital capacity. Large banks typically have greater capacity to provide credit and manage risk. However, in the banking sector, size is more often viewed in terms of total assets because the main products of banks are financing or funds and investments. Bank size determines the performance and stability of a bank, as larger assets usually lead to higher profitability due to greater efficiency in operational activities [17].

Capital Adequacy Ratio

The Capital Adequacy Ratio (CAR) is a key capital ratio that indicates a bank's ability to provide funds to cover the risk of loss from its operational activities and to support business development needs. The size of a bank's capital or assets influences public confidence in the bank's performance. The inclusion of the capital adequacy ratio (CAR) as a variable affecting bank profitability is based on its relationship to the bank's risk level. According to [5], CAR is a primary measure of a bank's financial strength. Banks with a

high CAR are considered more capable of absorbing losses and protecting depositors. An adequate CAR indicates that the bank has sufficient capital to support operations and manage risks [11].

Loan to Deposit Ratio

The Loan to Deposit Ratio (LDR) is an assessment of a bank's health from a liquidity perspective. LDR is the ratio of loans to third-party funds. According to [18], the liquidity needs of banks vary depending on the bank's size, business specifics, and other factors. This ratio helps banks manage liquidity risk and ensures they have enough funds to meet withdrawal demands from depositors. Experts generally agree that LDR is a key indicator in managing a bank's liquidity and operational efficiency. The optimal LDR varies depending on the bank's business model, market conditions, and applicable regulations, but maintaining a balance between liquidity and profitability is crucial for the bank's long-term success.

Total Debt

Total debt is the sum of all short-term and long-term liabilities that a company or bank owes to its creditors. This includes loans, bonds, and other forms of borrowed money that need to be repaid. Total debt is a critical metric in assessing a company's financial health and leverage, indicating the amount of financial risk and obligation the company carries. It is used by investors, analysts, and creditors to evaluate the company's financial stability and ability to meet its debt obligations. According to [19], total debt encompasses all of a company's financial obligations, including both short-term and long-term debt. This includes bank loans, issued bonds, and other forms of debt that must be repaid.

Inflation Rate

The inflation rate is one of the macroeconomic factors that significantly impacts Indonesia's economy and is believed to affect bank profitability. Inflation is the continuous increase in the prices of goods and services over a period of time. Inflation is the general and continuous rise in prices that reduces the purchasing power of money [20]. They emphasize that inflation reduces the purchasing power of money and can be caused by various factors such as increased aggregate demand, higher production costs, and inflation expectations. In general, inflation is a complex phenomenon caused by various factors, including monetary policy, aggregate demand, production costs, and inflation expectations. Managing inflation is one of the key challenges in economic policy, and various approaches have been proposed to control inflation to achieve economic stability.

Interest Rate

An interest rate refers to the cost of borrowing money or the return on investment expressed as a percentage per year. It is the amount charged by a lender to a borrower for the use of assets (typically expressed as a percentage of the principal), or the return earned by an investor for lending money or holding funds in an investment. Interest rates are influenced by various factors such as central bank policies, inflation expectations, economic conditions, and the risk associated with the borrower or investment. They play a crucial role in shaping economic activity, influencing consumer spending, business investment, and overall economic growth [21].

The hypothesis proposed in this research is:

- H1: Bank size is positively correlated with bank profitability, suggesting that larger banks are able to leverage economies of scale and scope to improve their financial performance.
- H2: A higher Capital Adequacy Ratio is positively associated with bank profitability, implying that well-capitalized banks are perceived as more stable and can operate with higher efficiency.
- H3: An optimal Loan-to-Deposit Ratio is expected to be positively related to bank profitability, indicating efficient utilization of deposits for lending and income generation.
- H4: The Debt-to-Asset Ratio is inversely related to bank profitability, with higher leverage potentially indicating financial stress and reducing profitability margins.
- H5: High inflation is hypothesized to negatively influence bank profitability, as it may erode the real value of earnings and lead to operational challenges.
- H6: The interest rate is predicted to have a positive and significant impact on bank profitability, with higher rates potentially improving interest income.

II. RESEARCH METHODS

Research Design

This study employs a quantitative research design to analyze the key performance indicators (KPIs) affecting bank profitability. Quantitative research is a method based on the philosophy of positivism, used to investigate specific populations or samples. The quantitative approach was chosen because the data used are secondary data in the form of financial figures from the financial statements of banking companies listed on the Indonesia Stock Exchange (IDX). This research covers the period from 2019 to 2023 and includes a sample of 47 banks listed on the IDX. The dependent variable is bank profitability, measured by Return on Assets (ROA), Return on Equity (ROE), and Net Interest Margin (NIM). This study combines specific bank factors, including bank size, total debt, Capital Adequacy Ratio, and loan risk, with macroeconomic factors, including the inflation rate and interest rate, to provide a comprehensive analysis.

Sample Selection

The sample consists of 47 banks listed on the Indonesian Stock Exchange, selected based on data availability and relevance to the study period. The sample includes 9 public banks and 38 Private banks. The banks were chosen to ensure a representative mix of both public and privately owned institutions, allowing for comparative analysis across different ownership structures.

Data Collection

The data source used in this research is secondary data. Secondary data are data that have been collected by other parties for specific purposes, and are then reused for research or other analysis purposes [22]. This data can include statistical data, reports, documents, or survey results that have been published. In this study, data were collected from various sources. Annual Reports and Financial Statements are used to obtain bank-specific data such as bank size, total debt, CAR, and loan risk. Central Bank and Regulatory Bodies are used for official data on macroeconomic indicators like inflation rate and interest rate.

Variables and Measurement

The dependent variable is a variable in a study or experiment that is influenced or explained by the independent variables. In the context of research, the dependent variable is often the variable that is measured, observed, or studied to understand how it is affected by or related to the independent variables. This variable is the main focus of analysis to examine how changes or variations in the independent variables can affect this variable. The dependent variable in this research is profitability, measured by:

- a. Return On Assets (ROA) is a financial ratio used to measure how efficiently a company generates profit from its assets. This ratio indicates how much net profit a company earns relative to its total assets. The calculation for ROA is as follows [23]:

$$\text{ROA} = \text{Net Income} / \text{Total Assets}$$

- b. Return on Equity (ROE) is a financial ratio used to measure a company's ability to generate profit from the equity invested by shareholders. ROE shows how efficiently a company uses the capital provided by shareholders to generate profit. The formula for calculating ROE is as follows [14]:

$$\text{ROE} = \text{Net Income} / \text{Shareholders' Equity}$$

- c. Net Interest Margin (NIM) is a financial ratio used to measure a bank's efficiency in managing interest-generating assets relative to interest-bearing liabilities. The calculation for NIM is as follows [24]:

$$\text{NIM} = (\text{Interest Income} - \text{Interest Expense}) / \text{Average Earning Assets}$$

Independent variables are variables considered as causes or variables that influence other variables in a study. These variables can be manipulated or changed by researchers to observe their impact on the dependent variable. In this study, the independent variables used consist of:

a. Specific bank factors:

1) Bank Size

Bank size refers to the scale of a bank, which can be measured by various aspects such as total assets, number of branches, number of employees, and capital. In this study, bank size is measured using the natural logarithm of total assets [5].

2) Total Debt (DAR)

Total debt is a financial metric that indicates the proportion of a company's assets that are financed by debt. It provides insights into the financial leverage and stability of a company. The formula for total debt is [25]:

$$\text{DAR} = \text{Total Debt} / \text{Total Assets}$$

3) Capital Adequacy Ratio (CAR)

CAR is a critical indicator for evaluating the financial health of a bank. Establishing a CAR that complies with applicable standards helps ensure that the bank has sufficient capacity to bear the risks it faces, thereby supporting overall banking system stability. The formula for calculating CAR is as follows [11]:

$$\text{CAR} = \text{Total Capital} / \text{Risk-Weighted Assets}$$

4) Loan To Deposit Ratio (LDR)

LDR is a significant indicator for evaluating the risk management policies, strategies, and liquidity management of a bank. A balanced ratio between loans and deposits is a key factor in maintaining the financial stability of a banking institution. The calculation for LDR is as follows [24] :

$$\text{LDR} = \text{Total Loans} / \text{Total Deposits}$$

b. Macroeconomic Factors:

1) Inflation Rate

Inflation rate is the percentage increase in the general price level of goods and services in an economy over a specific period, usually a year. It reflects the decrease in the purchasing power of a nation's currency. The inflation rate can be calculated using annual percentage change in the Consumer Price Index (CPI) [26].

2) Interest Rate

Interest rate is the percentage charged on borrowed money or the return earned on invested funds. It is usually expressed as an annual average lending rate [27].

Analysis Technique

This study employs panel data regression technique to analyze the impact of selected KPIs on bank profitability. Panel data regression is a statistical method used to analyze data that have two dimensions: cross-sectional and time series. Panel data regression enables the identification and measurement of effects that are not observable in cross-sectional or time series data separately. The model specifications:

$$\text{ROA}_{it} = \beta_0 + \beta_1 \text{Size}_{it} + \beta_2 \text{Debt}_{it} + \beta_3 \text{CAR}_{it} + \beta_4 \text{Loan}_{it} + \beta_5 \text{Inflation}_{it} + \beta_6 \text{Interest}_{it} + \varepsilon_{it}$$

$$\text{ROE}_{it} = \beta_0 + \beta_1 \text{Size}_{it} + \beta_2 \text{Debt}_{it} + \beta_3 \text{CAR}_{it} + \beta_4 \text{Loan}_{it} + \beta_5 \text{Inflation}_{it} + \beta_6 \text{Interest}_{it} + \varepsilon_{it}$$

$$\text{NIM}_{it} = \beta_0 + \beta_1 \text{Size}_{it} + \beta_2 \text{Debt}_{it} + \beta_3 \text{CAR}_{it} + \beta_4 \text{Loan}_{it} + \beta_5 \text{Inflation}_{it} + \beta_6 \text{Interest}_{it} + \varepsilon_{it}$$

The data analysis will be performed using statistical software Stata, which are well-suited for handling panel data and conducting regression analyses.

III. RESULT AND DISCUSSION

Table 1. Descriptive Statistics

	Obs	Mean	Min	Max	Std. Dev
Panel A: All Banks					
ROA	235	0.841	-15.890	13.580	3.317
ROE	235	2.765	-95.440	31.200	17.409
NIM	235	5.177	-12.240	46.246	5.910
LR	235	92.708	0.001	527.910	56.272
CAR	235	39.971	9.010	390.500	46.307
Debt	235	0.722	0.024	0.932	0.225
SIZE	235	20.510	13.481	32.351	4.684
INF	235	2.878	1.680	5.510	1.380
ITR	235	4.750	3.500	6.000	0.977
Panel B: Public Banks					
ROA	45	1.002	-14.750	4.030	2.924
ROE	45	6.284	-95.440	27.310	22.685
NIM	45	4.705	0.560	6.980	1.505
LR	45	84.568	51.380	146.770	14.880
CAR	45	23.372	9.010	44.720	8.012
Debt	45	0.767	0.214	0.932	0.193
SIZE	45	19.889	15.490	24.056	2.113
INF	45	2.878	1.680	5.510	1.392
ITR	45	4.750	3.500	6.000	0.986
Panel C: Private Banks					
ROA	190	0.803	-15.890	13.580	3.410
ROE	190	1.932	-89.030	31.200	15.868
NIM	190	5.289	-12.240	46.246	6.530
LR	190	94.636	0.001	527.910	62.044
CAR	190	43.903	10.780	390.500	50.585
Debt	190	0.711	0.024	0.919	0.231
SIZE	190	20.658	13.481	32.351	5.100
INF	190	2.878	1.680	5.510	1.380
ITR	190	4.750	3.500	6.000	0.977

Source: Processed Data (2024)

The descriptive statistics highlight distinct differences between public and private banks. Public banks tend to have higher ROE, lower NIM, and lower CAR compared to private banks. Private banks, on the other hand, exhibit greater variability in most metrics, including NIM, LR, and CAR. The inflation rate and interest rate show consistency across all bank types. These insights can inform further analysis on the performance and stability of different types of banks.

Table 2. Correlation matrix

	ROA	ROE	NIM	LR	CAR	DAR	SIZE	INF	ITR
ROA	1.000								
ROE	0.901***	1.000							
NIM	0.562***	0.438***	1.000						
LR	0.134**	-0.004	0.171***	1.000					
CAR	0.110*	-0.133**	0.269***	0.171***	1.000				
DAR	-0.131**	0.102	-0.370***	-0.391***	-0.708***	1.000			
SIZE	0.304***	0.235***	0.232***	0.128**	-0.030	-0.060	1.000		
INF	0.102	0.103	0.104	0.142**	0.031	-0.061	0.005	1.000	
ITR	0.159**	0.106	0.124*	0.203***	0.110*	-0.107	0.011	0.600***	1.000

Note(s): ***, **, and * represent significance at the 1, 5 and 10% level, respectively

Source: Processed Data (2024)

The correlation analysis reveals several significant relationships among the financial and economic indicators. ROA is positively correlated with ROE, indicating that as a company's profitability relative to its assets increases, the return generated on shareholders' equity also rises significantly. ROA also shows a positive correlation with NIM and SIZE, suggesting that higher asset returns are associated with better interest income management and larger company size.

ROE is positively correlated with both NIM and SIZE, implying that companies generating higher equity returns tend to manage their interest income more effectively and are generally larger in size. NIM displays a positive correlation with SIZE and a negative correlation with DAR. This suggests that larger companies tend to manage their interest income better, and higher NIM is associated with lower leverage.

CAR has a negative correlation with DAR, indicating that as a company's capital adequacy improves, its financial leverage decreases significantly. Lastly, the Inflation Rate (INF) is positively correlated with the Interest Rate (ITR), highlighting that higher inflation is associated with higher interest rates. These correlations provide valuable insights into the interrelationships among key financial metrics and economic indicators, aiding in the understanding of financial performance and stability.

Table 3. Regression results with Variables ROA Related to Bank Specific Factors

Variables	All Banks	Public Banks	Private Banks
Intercept	-13.403*** (0.000)	-65.245 (0.167)	-14.604*** (0.000)
Loan Risk	0.023*** (0.000)	0.018 (0.691)	0.024*** (0.000)
CAR	0.016 (0.062)	0.150 (0.338)	0.016 (0.058)
Debt	8.971** (0.008)	-3.210 (0.918)	10.489** (0.002)
SIZE	0.242* (0.030)	3.203 (0.191)	0.238* (0.031)
F-statistic	8.210 (0.000)	1.780 (0.158)	9.060 (0.000)
R-Squared	0.010	0.002	0.015
Number of Obs	235	45	190
Number of groups	47	9	38

Note(s): ***, **, and * represent significance at the 1, 5 and 10% level, respectively

Source: Processed Data (2024)

The results displayed in Table 3 from the regression analysis show how various internal factors of banks are associated with ROA. In model 1 and 3, an increase in loan risk, debt levels, and the size of the bank is found to correlate positively with the bank's ROA, indicating that as these factors increase, there tends to be an increase in the bank's profitability. However, the size factors tested do not show a significant impact on ROA. When examining public banks as per model 2, loan risk, CAR, debt, and size levels do not present a significant relationship with ROA, implying that these factors do not affect the profitability of public banks in this particular model.

Table 4. Regression results with Variables ROE Related to Bank Specific Factors

Variables	All Banks	Public Banks	Private Banks
Intercept	-38.422 (0.056)	-591.178* (0.028)	-49.861** (0.008)
Loan Risk	0.036 (0.132)	-0.071 (0.775)	0.049* (0.027)
CAR	-0.001 (0.977)	1.388 (0.115)	-0.001 (0.974)
Debt	2.990 (0.870)	-100.996 (0.561)	17.263 (0.310)
SIZE	1.743** (0.004)	32.609* (0.020)	1.692** (0.002)
F-statistic	2.600	7.620	3.630

Variables	All Banks	Public Banks	Private Banks
	(0.038)	(0.001)	(0.007)
R-Squared:	0.019	0.021	0.027
Number of Obs	235	45	190
Number of groups	47	9	38

Note(s): ***, **, and * represent significance at the 1, 5 and 10% level, respectively
Source: Processed Data (2024)

Table 4 outlines the regression results that determine the relation between banks' internal factors and ROE. For all banks, public and private banks, the size of the bank exhibits a positive relationship with ROE. This suggests that larger banks tend to have higher profitability. For private banks, alongside the positive correlation between size and ROE, loan risk also displays a positive relationship with ROE. This indicates that in private banks, both a larger asset base and higher risk-taking contribute to improving profitability on equity.

Table 5. Regression results with Variables NIM Related to Bank Specific Factors

Variables	All Banks	Public Banks	Private Banks
Intercept	10.436*** (0.001)	3.967 (0.750)	10.420** (0.003)
Loan Risk	0.012** (0.001)	0.004 (0.723)	0.013** (0.002)
CAR	0.001 (0.875)	0.123** (0.005)	0.001 (0.924)
Debt	-0.196 (0.944)	16.921* (0.049)	-0.016 (0.996)
SIZE	-0.307** (0.001)	-0.778 (0.233)	-0.307** (0.003)
F-statistic	6.680 (0.000)	3.610 (0.015)	5.610 (0.001)
R-Squared	0.008	0.127	0.009
Number of Obs	235	45	190
Number of groups	47	9	38

Note(s): ***, **, and * represent significance at the 1, 5 and 10% level, respectively
Source: Processed Data (2024)

Table 5 shows the regression analysis findings on how internal banking factors relate to NIM. For all banks and private banks, the analysis indicates that loan risk has a positive association with NIM. This means that as banks take on higher loan risks, their net interest margins tend to increase, possibly due to charging higher interest rates to compensate for the increased risk. However, the size of a bank shows a negative correlation with NIM. This trend implies that as banks become larger, their net interest margins tend to decrease, which might be due to increased competition or operational inefficiencies impacting larger banks more than smaller ones.

For public banks specifically, the regression results reveal a positive relationship between the capital adequacy ratio and NIM, as well as between debt levels and NIM. A higher CAR could indicate a stronger capital buffer, which may lead to more favorable funding conditions and thus a higher NIM. The positive connection between debt and NIM in public banks may stem from the utilization of debt in a way that enhances net interest margins.

Table 6. Regression results with Variables ROA Related to Macroeconomic

Variables	All Banks	Public Banks	Private Banks
Intercept	-16.796*** (0.000)	-40.043 (0.418)	-17.213*** (0.000)
Loan Risk	0.022*** (0.000)	-0.007 (0.890)	0.023*** (0.000)

Variables	All Banks	Public Banks	Private Banks
CAR	0.020 * (0.024)	0.092 (0.567)	0.019* (0.029)
Debt	10.637 ** (0.002)	-7.272 (0.816)	11.711 *** (0.001)
SIZE	0.246* (0.025)	2.113 (0.402)	0.242* (0.028)
INF	-0.099 (0.485)	-0.172 (0.603)	-0.095 (0.548)
ITR	0.510* (0.014)	0.738 (0.145)	0.406 (0.079)
F-statistic	6.790 (0.000)	1.600 (0.180)	6.660 (0.000)
R-Squared	0.008	0.013	0.012
Number of Obs	235	45	190
Number of groups	47	9	38

Note(s): ***, **, and * represent significance at the 1, 5 and 10% level, respectively

Source: Processed Data (2024)

Table 6 expands the regression analysis to include both macroeconomic and industry-specific factors. The results for all banks, as well as private banks, show that ROA has a significant and positive relationship with loan risk, capital adequacy ratio, debt levels, and the size of the bank. These results are consistent with the research conducted by [4], [5], [10], and [16].

In contrast, for public banks, these particular internal factors do not predict changes in profitability as measured by ROA within the scope of this study. When it comes to the connection between interest rates and ROA, there is a positive and significant association for all banks. This is to say that higher interest rates correlate with greater bank profitability. This is consistent with [2] and [3], suggesting that these banks benefit from higher interest incomes and potentially better risk management in lending practices. This effect might arise because as interest rates climb, banks can earn more on their interest-bearing assets relative to the interest they pay on deposits and other liabilities, thereby boosting their overall profitability.

Table 7. Regression results with Variables ROE Related to Macroeconomic

Variables	All Banks	Public Banks	Private Banks
Intercept	-58.931** (0.005)	-510.563 (0.077)	-65.639** (0.001)
Loan Risk	0.027 (0.260)	-0.150 (0.579)	0.042 (0.060)
CAR	0.018 (0.710)	1.204 (0.194)	0.014 (0.746)
Debt	13.528 (0.463)	-113.759 (0.524)	25.043 (0.149)
SIZE	1.765** (0.003)	29.115* (0.049)	1.718** (0.002)
INF	-0.239 (0.759)	-0.602 (0.750)	-0.291 (0.713)
ITR	2.783* (0.014)	2.398 (0.401)	2.222 (0.056)
F-statistic	3.150 (0.006)	5.020 (0.001)	3.240 (0.005)
R-Squared	0.025	0.027	0.030
Number of Obs	235	45	190
Number of groups	47	9	38

Note(s): ***, **, and * represent significance at the 1, 5 and 10% level, respectively

Source: Processed Data (2024)

Table 7 offers the results from regression models that have been augmented to include a selection of macroeconomic and industry-specific factors to assess their impact on bank profitability. For every category of banks examined, which includes all banks collectively, as well as public and private banks individually, the size of the bank demonstrates a significant positive relationship with ROA. This indicates that regardless of the bank type, larger banks tend to be more profitable, suggesting that increased scale may contribute positively to a bank's return on equity. This finding supports [28] empirical findings.

Additionally, the analysis evaluates the effect of interest rates on ROE for banks. It finds a positive and significant correlation across the board. This suggests that when interest rates increase, it positively affects the profitability of banks. This result is supported by [9]. The reasoning behind this could be that higher interest rates enable banks to achieve greater returns on the lending side of their business, which exceeds the cost of the interest paid out to depositors and creditors, thereby resulting in higher profitability as captured by ROE.

Table 8. Regression results with Variables NIM Related to Macroeconomic

Variables	All Banks	Public Banks	Private Banks
Intercept	8.104* (0.013)	11.434 (0.378)	7.949* (0.031)
Loan Risk	0.011** (0.003)	-0.000 (0.968)	0.011** (0.007)
CAR	0.004 (0.620)	0.102* (0.020)	0.004 (0.655)
Debt	0.888 (0.754)	15.244 (0.070)	1.031 (0.748)
SIZE	-0.304** (0.001)	-1.086 (0.106)	-0.303** (0.003)
INF	-0.116 (0.333)	0.054 (0.530)	-0.172 (0.244)
ITR	0.390* (0.026)	0.140 (0.289)	0.453* (0.036)
F-statistic	5.400 (0.000)	3.140 (0.017)	4.550 (0.001)
R-Squared	0.002	0.127	0.002
Number of Obs	235	45	190
Number of groups	47	9	38

Note(s): ***, **, and * represent significance at the 1, 5 and 10% level, respectively

Source: Processed Data (2024)

Table 8 continues to explore the impact of macroeconomic and industry-specific factors on bank profitability. For all banks as a collective and private banks specifically, the results indicate that NIM shares a positive relation with loan risk and interest rates. This implies that an increase in loan risk potentially reflecting higher interest income from riskier loans and a rise in interest rates possibly indicating better margins on loans. The size of a bank is found to have a negative relationship with NIM for all banks and private banks. This suggests that beyond a certain point, as banks grow larger, their profitability in terms of NIM does not continue to increase but may actually decrease, which could be due to a variety of reasons such as increased operational complexity or inefficiencies that larger banks may face. Specifically looking at public banks, the Capital Adequacy Ratio presents a positive and significant relationship with NIM. This is in line with research conducted by [11] and [26]. This means that for public banks, maintaining a higher level of capital relative to their risk-weighted assets is associated with better profitability. This could be interpreted as investors and customers perceiving well-capitalized banks as safer and more reliable, which could lead to a more favorable business environment and increased profitability [4].

IV. CONCLUSION

This study utilizes a quantitative approach, underscore the multifaceted dynamics influencing bank profitability within Indonesia's banking sector. Spanning 47 banks from 2019 to 2023, this research sheds light on the interplay between bank-specific and macroeconomic factors, paving the way for theoretical and practical implications in business and management, especially within the purview of sustainable development in the Asia-Pacific region.

The results regarding bank-specific factors reveal that size, debt, Capital Adequacy Ratio, and loan risk are pivotal in determining bank profitability. For private banks, an increase in loan risk and debt levels has been associated with an increased Return on Assets, indicating a positive yield from managing higher risk and leveraging debt effectively. Contrastingly, in public banks, these factors do not predict ROA as strongly, suggesting alternative profitability mechanisms are at play. Likewise, size positively affects Return on Equity across all banks, pointing to benefits derived from economies of scale. However, when it comes to Net Interest Margin, the impact of size is negative, especially in larger institutions, which may suffer from inefficiencies or competitive pressures. Macroeconomic factors such as inflation and interest rates also play a critical role. Elevated interest rates improve profitability across the banking sector by enhancing margins, shedding light on the sensitivity of Indonesian banks to national economic policies and global market trends.

This study carries implications for banking strategies, emphasizing the need for a nuanced understanding of the divergent impacts of internal factors on different types of banks. Managers in private banks should focus on optimizing debt and managing loan risks, while public banks should concentrate on capital adequacy to maintain stability and investor confidence. These findings enrich the discourse on sustainable business development in banking, particularly the need for models that integrate both bank-specific and macroeconomic considerations. This aligns with the sustainable growth and financial stability goals in the Asia-Pacific business context.

The study's contributions pave the way for numerous research opportunities that can explore the causal connections between the identified factors and profitability. Longitudinal studies could provide deeper insights into trends over time, while comparative studies across the Asia-Pacific could highlight regional similarities or disparities.

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