

The Impact of Capital Adequacy, Credit Risk, and Operational Efficiency on the Profitability of State-Owned Banks in Indonesia (2014-2023)

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ABSTRACT

This study examines the impact of internal banking factors, including capital adequacy, credit risk, and operational efficiency, on the profitability of state-owned banks in Indonesia from 2014 to 2023. A quantitative approach is employed, utilizing secondary data obtained from the Financial Services Authority (OJK) website and the financial reports of state-owned banks. The results indicate that capital adequacy negatively and significantly impacts the profitability of state-owned banks, whereas credit risk has a positive but statistically insignificant effect. Furthermore, operational efficiency shows a negative and significant correlation with bank profitability. These insights are anticipated to provide useful guidance for policymakers in formulating strategies aimed at improving the profitability of state-owned banks.

INTRODUCTION

Banking is a financial institution that acts as the backbone of a country's economy, both developed and developing countries (Ikmal, 2018). Financial institutions are also crucial in fostering financial development (Silitonga & Manda, 2022). Particularly in Indonesia, the government has banks that are State-Owned Enterprises (BUMN) to support financial development as well as one of the pillars of the Indonesian economy. To fulfil its role, a state-owned bank needs to make efforts to earn and increase its profitability. Bank profitability is an index used to see the bank's ability to generate profits over time (Niu & Wokas, 2021). In the era of globalisation, state-owned banks must manage the company as well as possible to get the maximum profit (Aji & Manda, 2021). When compared to the banking industry in general, state-owned banks have a high percentage of profit growth. In addition, the net profit growth of state-owned banks was much faster than banking in general as of January 2020. According to information provided by Indonesia's Financial Services Authority (OJK) in early 2020, state-owned banks recorded a net profit of Rp 6.31 trillion. This figure represents a growth of 9.35% in comparison to January 2019, when the profit was Rp 5.77 trillion (Tofan et al., 2022).

To increase the growth of bank profitability, banks need to expand credit by increasing capital adequacy (Pasaribu & Sari, 2011). Capital Adequacy Ratio (CAR) is an indicator to see the adequacy of bank capital which is characterised by the ability of management to control risks that can affect the amount of bank capital (Parenrengi & Hendratni, 2018). Within the framework of the capital adequacy ratio in Indonesian banking, its value is assessed based on the bank's capital, which comprises core capital and supplementary capital, along with the total risk-weighted assets (Fitrianto & Mawardi, 2006). This capital adequacy is an important thing, because if a bank has sufficient capital, the bank's operational activities including lending to debtors can run smoothly (Putra & Raymond, 2019).

However, state-owned banks must also be careful in lending to debtors so that credit risk (Non Performing Loan) is not too high. This credit risk occurs because the debtor fails to return the borrowed funds so that it can disrupt the health of the bank. This is something to watch out for as state-owned banks rely heavily on loan interest income to finance their operations and ensure their financial stability (Barus & Erick, 2017). Therefore, it is important for these banks to conduct in-depth credit analyses and monitor debtor performance regularly in order to take appropriate mitigation measures before the risks become too great.

The costs incurred to finance the bank's operational activities greatly affect the bank's profit (Sudiyatno & Fatmawati, 2013) so operational efficiency is very important for state-owned banks. Operational efficiency is one of the keys to success in business, as it can increase productivity and significantly reduce operating costs (Bauer, 2018). In the banking sector, operational efficiency may be evaluated through the ratio of operating expenses to operating income, commonly referred to as the BOPO ratio (Christaria & Kurnia, 2016). A lower BOPO ratio indicates higher efficiency in a bank's operations.

There have been several studies examining bank profitability. This research has been conducted on banks in Europe, but only discusses the effect of NPLs on bank profitability (Elekdag et al., 2020). In addition, there has been research on the profitability of state-owned banks in Indonesia, but the information collected is only from 2008 to 2016 so it does not have the latest data until 2023 (Rachmawati & Marwansyah, 2019).

Based on this information, no research has been conducted on the impact of capital adequacy, credit risk, and operational efficiency on the profitability of state-owned banks (BUMN) up to 2023. Such research is necessary as it can provide insights into the capital adequacy ratio, loan risk ratio, and operational efficiency ratio of state-owned banks before, during, and after the COVID-19 pandemic, considering the significant changes in economic dynamics.

Analyzing internal factors within a bank's control, such as capital adequacy, credit risk, and operational efficiency, can help identify which factors significantly affect the profitability of state-owned banks. This information can be used to determine areas for improvement to enhance profitability and strengthen their role as key drivers of the Indonesian economy.

This research can also aid bank management and policymakers by offering strategic insights aimed at enhancing the profitability of state owned banks. Therefore, the objective of this study is to examine the influence of capital adequacy, credit risk, and operational efficiency on the profitability of BUMN banks and to determine the extent and significance of these internal factors on profitability during the period from 2013 to 2024.

LITERATURE REVIEW

Grand Theory Resource Based View

This research adopts the Resource Based View (RBV) theory as its primary framework, as it effectively clarifies the connection between the independent and outcome variables. The RBV theory highlights the importance of internal resources and organizational capabilities such as capital adequacy, credit risk management, and operational efficiency in gaining a competitive advantage and improving organizational performance, particularly in banking profitability (Elbanna & Abdel Maksoud, 2020). Thus, this theory is considered appropriate for representing the variables examined in this study.

Capital Adequacy

Capital adequacy refers to the minimum capital that a bank must maintain to mitigate risk, ensure financial stability, and safeguard depositors (Fiordelisi et al., 2021). It represents the required level of capital a bank needs to absorb unexpected losses and maintain financial resilience (Abdul Karim et al., 2014). Additionally, capital adequacy is often defined as the ratio between a financial institution's capital and its total assets or deposits (Sharpe, 1978).

Based on these definitions, capital adequacy can be understood as the minimum capital requirement that banks must fulfill to sustain financial stability, manage risks effectively, and protect depositors. The measurement of capital adequacy is commonly done using the Capital Adequacy Ratio (CAR), which evaluates a bank's capacity to absorb losses while maintaining financial soundness (Mukuddem Petersen & Petersen, 2008). CAR is determined by dividing Regulatory Bank Capital (RBC) by Risk Weighted Assets (RWA).

$$\text{CAR} = \text{RBC} : \text{RWA}$$

There have been several studies that examine how capital adequacy affects bank profitability. Higher capital adequacy ratios may lead to increased risk-taking behaviour in banks, which may increase profitability (Abdul Wahab et al., 2017). Research conducted by Dedi Gunawan Putra indicates that capital adequacy has a significant impact on the profitability of Bank Riau Kota Batam, with a probability value of 0.013 (Putra & Raymond, 2019A research investigation into the influence of capital adequacy on the profitability of conventional banks listed on the Indonesia Stock Exchange from 2011 to 2015 revealed a notable correlation between capital adequacy and bank profitability (Setiawati et al., 2017). Further research reveals that the capital adequacy ratio has a significant positive effect on Return on Assets (ROA) (Mukaromah & Supriono, 2020). Similarly, other studies demonstrate a positive relationship between bank capital and profitability, indicating that higher capital adequacy generally contributes to increased profitability (Coccorese & Girardone, 2021). Bank capital also significantly affects profitability, with larger banks showing higher persistence coefficients for profitability metrics such as VROA and VROE (Lee et al., 2015).

There are several explanations from previous studies why capital adequacy positively and significantly influences bank profitability. Banks that have adequate capital can carry out their operational activities efficiently to enhance the bank's profitability (Parenrengi & Hendratni, 2018). Banks that have adequate capital can also strengthen public confidence due to the bank's considered to be able to bear the risks that will be faced, so this can increase the profitability of the bank (Setiawati et al., 2017). Sufficient capital functions not only as the essential source of financing for operational endeavors but also as a strong basis for addressing future risks. As a result, an elevated capital adequacy ratio equips the bank with the opportunity to realize significant profits (Prasetyo & Darmayanti, 2015).

The results of prior research suggest that capital adequacy exerts a positive and significant influence on the profitability of banks. This implies that an elevated level of capital adequacy bolsters a bank's financial stability, subsequently leading to enhanced profitability.

H1 : Capital adequacy has a positive and significant effect on bank profitability.

Credit Risk

Credit risk refers to the probability that a borrower will default on principal or interest payments, which poses a significant concern for financial institutions and regulatory frameworks (Kazemi & Mosleh, 2012). Credit risk is the risk that debtors (borrowers, counterparties) may be unable or unwilling to pay their debts (Schuermann, 2005). Credit risk refers to the potential loss due to the failure of a borrower to repay a loan or fulfil a contractual obligation (Accornero et al., 2018). According to the aforementioned definition, it can be inferred that credit risk refers to the possible loss resulting from a borrower's inability to repay the loan and the associated interest. The assessment of credit risk is typically conducted through the evaluation of Non-Performing Loans (NPL). The greater the NPL ratio, the worse the credit quality of a bank because it indicates the greater number of non-performing loans (Aji & Manda, 2021). NPL can be calculated by dividing non-performing loans by total loans and then multiplying by one hundred per cent (Nuryanto et al., 2020).

$$\text{NPL} = \text{Total non-performing loans} : \text{Total loans} \times 100\%$$

Credit risk has a negative (opposite) and significant effect on bank profitability. Banks with a high NPL ratio can increase the costs that will be incurred by the bank, for example, such as the cost of provisioning productive assets so that it can cause losses to the bank (Dewi & Srihandoko, 2018). Other studies also show that high credit risk has a negative effect on bank profitability, because banks that have a high NPL ratio do not dare to increase their lending to the public which ultimately reduces bank profitability (Wijaya & Tiyas, 2019). Based on the above research, it can be concluded that credit risk has a negative and significant effect on bank profitability.

H2 : Credit risk has a negative and significant effect on bank profitability.

Operational Efficiency

Operational efficiency in banks refers to the effectiveness of their internal processes in utilising resources to produce outputs (Li et al., 2022). Operational efficiency in banks refers to the effectiveness of their processes in generating profits while managing deposits. It involves evaluating the process of deposit production and utilisation, including profit generation and interest income, to identify areas of inefficiency and improvement (Shi et al., 2021). Operational efficiency in banks refers to the bank's effectiveness in managing its internal processes and resources to generate income (Gulati & Kumar, 2017). Based on the definition above, it can be concluded that the operational efficiency of a bank is the bank's ability to produce outputs as optimally as possible by utilising inputs. The operational efficiency of banks is measured using BOPO namely by comparing operating expenses with operating income (Aprilia & Soebroto, 2020).

$$\text{BOPO} = \text{Operational Costs} : \text{Operating income} \times 100\%$$

Studies show how the Operating Cost to Operating Income (OCOI) ratio negatively impacts bank profitability. A higher OCOI indicates inefficiency, leading to a decrease in profitability as banks struggle to manage costs relative to their revenue generators (Bundesbank et al., 2019). A higher operating cost to operating income ratio indicates higher operating costs and inability to generate revenue, which negatively impacts the bank's profitability (Yousef et al., 2023). In addition, an increase in cost-scale efficiency enhances profitability in both sustainable and conventional banks. This indicates that operational efficiency significantly influences bank profitability, irrespective of the bank's adoption of sustainability practices (Olmo et al., 2021). Another study also found a significant relationship between operational efficiency and profitability in banks, suggesting that higher operational efficiency leads to increased profitability (Kong et al., 2017). Higher operational efficiency in banks positively affects profitability. Efficient banks are able to reduce costs and improve services, thus leading to improved financial performance and competitive advantage in the banking sector (González et al., 2019). According to the results of this study, it can be determined that operational efficiency has a negative and significant effect on bank profitability.

H3 : Operational efficiency has a negative and significant effect on bank profitability.

Bank Profitability

Bank profitability reflects a bank's financial performance and is commonly assessed using key financial ratios such as return on assets (ROA) and return on equity (ROE). Several factors influence bank profitability, including net profit growth, the cost-income ratio, and the overall economic growth rate (Alihodžić, 2020). Specifically, ROA is utilized as an indicator of profitability by comparing pre-tax profit with total assets. (Nuryanto et al., 2020).

$$\text{ROA} = (\text{Pre-tax profit} / \text{Total assets}) \times 100\%$$

Research Framework

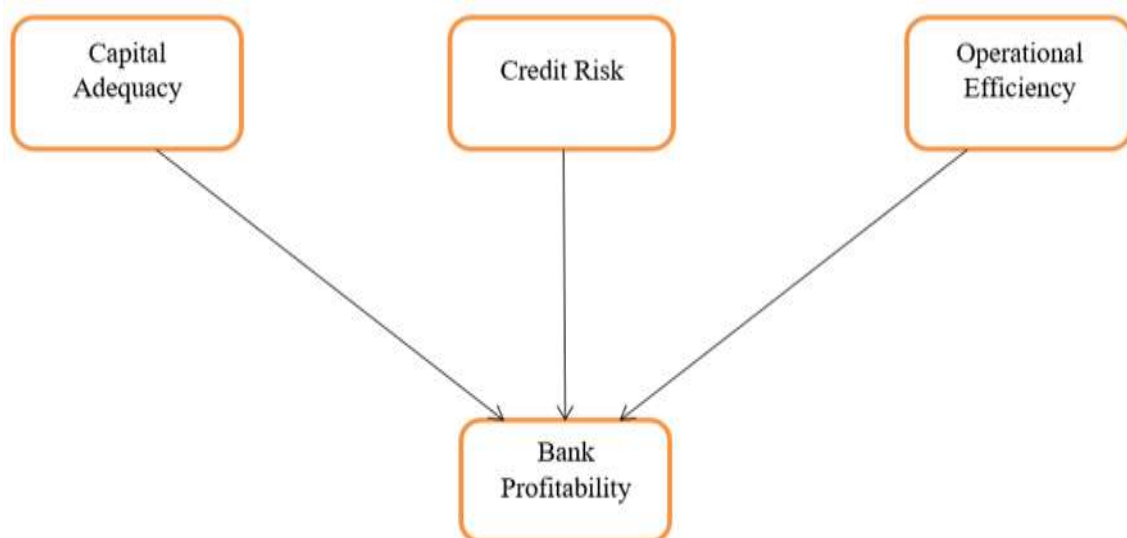


Figure.1 Research Framework

METHODOLOGY

To achieve the research objectives, this study used quantitative research methods. Quantitative research systematically explores phenomena by collecting and interpreting numerical data using statistical methods (Rijgersberg et al., 2009). The focus of this research is to determine the influence of internal factors that affect the profitability of state-owned banks for the period 2014 to 2023, so this research method is suitable for use. This study uses secondary data used in panel data regression. For the data period, this study uses annual data, starting from 2014 to 2023. The data obtained from the authorized publications of the Financial Services Authority (OJK) and the Indonesia Stock Exchange, which includes information on four state-owned banks. Indonesian Islamic banks are not included because they do not apply credit loans. The data that has been collected will then be analysed using Eviews 12 software.

The estimation model used in this study is the Fixed Effects Model (FEM) estimator. A fixed effects model was deemed appropriate as it accounts for unobserved heterogeneity by controlling for time invariant characteristics within entities, thus providing an unbiased estimate of treatment effect (Homola et al., 2024). In addition, the FEM model was selected after the Chow Test and Hausman Test were conducted to determine the model selection. It should also be noted that a number of model specification tests or classical assumption tests have been conducted. Some of the specification tests used for the Fixed Effects Model (FEM), the first is the normality test to ensure that the data used is normally distributed. Secondly, the multicollinearity test is conducted to verify the absence of a strong linear correlation among the predictor variables that can affect the estimation results, third is the heteroscedasticity test which is used to identify the existence of inequality of variance of the residuals between observations.

RESEARCH RESULT

Model Selection Test Results

1. Chow Test

Table 1. The Results of Chow Test

Effects Test	Statistic	d.f.	Prob.
Cross-section F	20.994081	(3,33)	0.0000
Cross-section Chi-square	42.706226	3	0.0000

Following the Chow test, the probability value obtained is 0.0000, which is less than 0.05. This indicates that the Fixed Effect Model (FEM) is the appropriate choice, requiring further analysis using the Hausman test.

2. Hausman Test

Table 2. The Results of Hausman Test

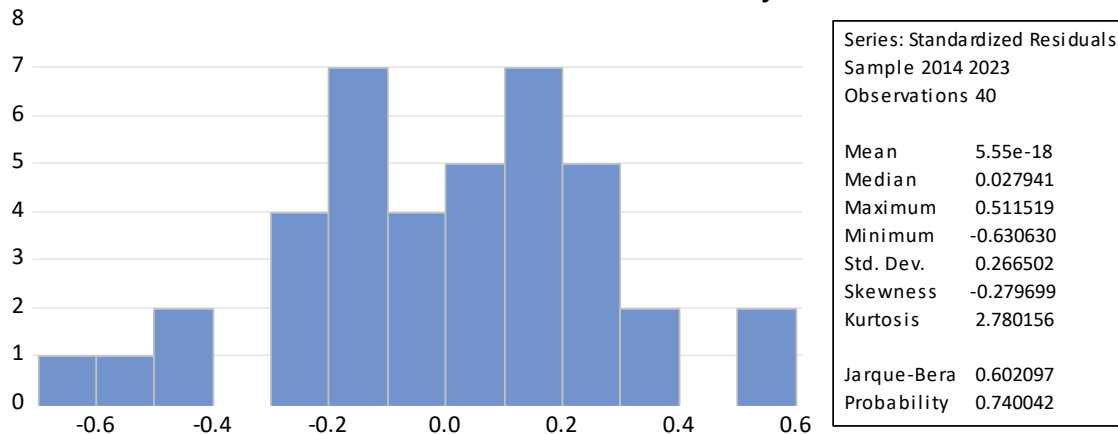
Test Summary	Chi-Sq. Statistic	Chi-Sq. d.f.	Prob.
Cross-section random	62.982244	3	0.0000

After conducting the Hausman test, the probability value obtained was 0.0000, which is less than 0.05. This confirms that the Fixed Effect Model (FEM) is the appropriate choice. As the FEM model has been selected in both tests, it is determined to be the most suitable model for this study.

Classical Assumption Test Results

1. Normality Test

Table 3. The Results of Normality Test



After the normality test, it is found that the value of Jarque-Bera Probability is 0.74. This result exceeds 0.05, indicating that the research model follows a normal distribution.

2. Multicollinearity Test

Table 4. The Results of Multicollinearity Test

1.000000	-0.409710	-0.554747
-0.409710	1.000000	0.765079
-0.554747	0.765079	1.000000

The results of the multicollinearity test indicate no signs of multicollinearity. This is demonstrated by the fact that none of the correlation values between the predictor variables exceed 0.8, confirming the absence of multicollinearity issues.

3. Heteroscedasticity Test

Table 5. The Results of Heteroscedasticity Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	0.825760	0.428448	1.927326	0.0626
X1	-0.018301	0.014253	-1.284010	0.2081
X2	-0.028078	0.075239	-0.373188	0.7114
X3	-0.003314	0.004309	-0.769123	0.4473

After the heteroscedasticity test, it is found that the Prob. value of the capital adequacy, credit risk, and operational efficiency variables is 0.2081, 0.7114, and 0.4473, these numbers are greater than 0.05. Thus, the model used does not show symptoms of heteroscedasticity.

Panel Data Regression Equation

The equation for panel data regression is as follows:

$$Y = 11.61625874 - 0.0921832303759 \cdot X_1 + 0.249186988294 \cdot X_2 - 0.102720946267 \cdot X_3 + [CX=F]$$

The panel data regression equation demonstrates the direction of the impact that every predictor variable has on the outcome variable. A negative regression coefficient for an predictor variable signifies an inverse correlation with the outcome variable, in this case, the profitability of state-owned banks. On the other hand, a positive regression coefficient signifies a direct relationship, implying that an increase in the predictor variable corresponds to an increase in profitability. The panel data regression equation can be expressed as follows:

1. The constant value of 11.61 indicates that in the absence of the predictor variables, the outcome variable, bank profitability, is expected to increase by 1161%.
2. The beta coefficient for the capital adequacy variable (X1) is -0.09, meaning that if all other variables remain constant and X1 increases by 1%, the bank profitability variable (Y) will decline by 9%.
3. The beta coefficient for the credit risk variable (X2) is 0.24, implying that if other variables remain unchanged and X2 increases by 1%, bank profitability (Y) will rise by 24%. Conversely, a decrease in X2 will lead to a reduction in Y.
4. The beta coefficient for the operational efficiency variable (X3) is -0.10, signifying that if all other variables are held constant and X3 increases by 1%, bank profitability (Y) will decrease by 10%. Similarly, a decrease in X3 will result in an increase in Y.

Hypothesis Test

1. T Test

Table 6. The Results of T Test

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	11.61626	0.806379	14.40545	0.0000
X1	-0.092183	0.026826	-3.436350	0.0016
X2	0.249187	0.141606	1.759718	0.0877
X3	-0.102721	0.008109	-12.66748	0.0000

The Effect of Capital Adequacy on the Profitability of State-Owned Banks for the Period 2014–2023

The results of the T-test on the capital adequacy variable (X1) show a t-statistic value of -3.436 and a probability value of 0.0016. Since this probability value is below the 0.05 threshold, it can be inferred that capital adequacy has a statistically significant impact on the profitability of state-owned banks (BUMN) during the 2014–2023 period.

However, these findings contradict the initial hypothesis, which suggested that capital adequacy positively influences the profitability of BUMN banks. The beta coefficient for capital adequacy is -0.09, indicating that a 1% increase in capital adequacy results in a 9% decline in bank profitability. This suggests that holding excessive capital without effectively utilizing it for productive purposes, such as credit distribution and investment, may negatively affect profitability. These results align with the study conducted by Komang Triska Ariwidanta, which also found a negative and significant relationship between capital adequacy and bank profitability (Triska Ariwidanta, 2016).

The Effect of Credit Risk on the Profitability of BUMN Banks for the Period 2014-2023

After conducting the T-test on the credit risk variable, the value of the t-statistic was 1.759 and the Prob. value was 0.0877, this value is greater than 0.05 so it can be concluded that the credit risk variable does not have a significant effect on the profitability of BUMN banks for the period 2014-2023. The findings of this study do not align with the second hypothesis, which states that credit risk has a negative and significant effect on the profitability of state-owned banks for the period 2014–2023. The beta coefficient for the credit risk variable is 0.24, indicating that if all other variables remain constant and credit risk increases by 1%, the profitability of state-owned banks will also increase by 24%.

Thus, the results suggest that credit risk has a positive but insignificant effect on the profitability of state-owned banks during the observed period. While these findings contradict the initial hypothesis, they are consistent with the research conducted by Ni Wayan Wita Capriani and I Made Dana, which concludes that credit risk has a positive and significant impact on bank profitability (Wayan & Capriani, 2016).

The effect of operational efficiency on the profitability of BUMN banks for the period 2014 - 2023

After conducting the T test for the operational efficiency variable, the t-Statistic value is -12.667 and the Prob. value is 0.0000, the Prob. value is smaller than 0.05 so it can be concluded that the operational efficiency variable has a significant effect on the profitability of state-owned banks for the period 2014-2023.

The results of this study are in accordance with the third hypothesis, namely operational efficiency has a negative and significant effect on the profitability of BUMN Banks. This is evidenced by the beta coefficient value of the operational efficiency variable, namely -0.10, which means that if the operational efficiency variable increases by 1%, the profitability of BUMN banks will decrease by 10%, besides that the Prob. value of the operational efficiency variable t test is 0.0000, which means that operational efficiency has a significant effect on the profitability of BUMN banks.

Simultaneous Test

Table 7. The Results of Simultaneous Test

Effects Specification			
Cross-section fixed (dummy variables)			
R-squared	0.945876	Mean dependent var	2.504500
Adjusted R-squared	0.936035	S.D. dependent var	1.145529
S.E. of regression	0.289719	Akaike info criterion	0.517816
Sum squared resid	2.769919	Schwarz criterion	0.813369
Log likelihood	-3.356311	Hannan-Quinn criter.	0.624679
F-statistic	96.11834	Durbin-Watson stat	0.754577
Prob(F-statistic)	0.000000		

After conducting a simultaneous test to see whether the predictor variables simultaneously have a significant effect on the outcome variable, the value of the F-statistic is 96,118 and the Prob (F-statistic) value is 0.0000 which is smaller than 0.05, so it can be concluded that the predictor variables (X1, X2, X3) simultaneously have a significant effect on the profitability of state-owned banks for the period 2014-2023.

Coefficient of Determination Analysis

In table 7 in the Adjusted R-squared section, it is found that the value is 0.936, it can be concluded that the contribution of the predictor variable to the outcome variable simultaneously is 93.6%.

CONCLUSIONS AND RECOMMENDATIONS

Based on the discussion previously described, there are several conclusions, namely, 1) Capital adequacy partially has a negative and significant effect on the profitability of BUMN Banks for the period 2014-2023 with a beta coefficient value is -0.09 and Prob. value is 0.0016 which is smaller than 0.05. 2) Credit risk partially has a positive and insignificant effect on the profitability of BUMN Banks for the period 2014-2023 with a beta coefficient value is 0.24 and a Prob. value is 0.0877 which is greater than 0.05. 3) Operational efficiency partially has a negative and significant effect on the profitability of BUMN Banks for the period 2014-2023 with a beta coefficient value of -0.10 and a Prob. value of 0.0000 which is smaller than 0.05.

Next, there are some suggestions that can be given to the BUMN Banks. In terms of capital adequacy, BUMN banks need to strike a balance between capital requirements and profit optimisation efforts. One way this can be done is by allocating capital to productive activities such as investment and expanding healthy lending. Furthermore, for credit risk factors, BUMN banks need to maintain the quality of lending by tightening the assessment of prospective debtors and monitoring debtors. BUMN banks can also increase credit products whose risk levels are controlled but remain competitive and can make customers more interested. For operational efficiency, BUMN banks need to optimise their workforce by limiting the number of employees to those required by the bank's operations. BUMN banks also need to cut costs that do not directly support business development.

For suggestions for future researchers, it is hoped that they can add variables that are not involved in this study, such as liquidity. Or it could also add to the number of banks studied, so not only state-owned banks but if possible all banks listed on the Indonesian stock exchange.

ADVANCED RESEARCH

This study has several limitations that need to be acknowledged. First, it focuses only on state-owned banks in Indonesia, which may limit the generalizability of the findings to other types of banks, such as private or regional banks. Second, the study primarily examines internal factors, such as capital adequacy, credit risk, and operational efficiency, without considering external influences like macroeconomic conditions, regulatory changes, or global financial trends. These factors could significantly impact banking profitability and should be explored in future research.

For future studies, it is recommended to expand the research scope by including different types of banks to obtain a more comprehensive understanding of profitability determinants. Additionally, incorporating external variables, such as economic growth, inflation, and technological advancements, could provide a deeper insight into the dynamic interactions affecting banking performance. A longitudinal study covering a broader time frame may also offer more valuable perspectives on long-term trends and policy implications.

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