

The Influence of Non-Performing Loans, Operational Efficiency, and Capital Adequacy Ratio on the Financial Performance of Banking Firms Listed on the Indonesia Stock Exchange (IDX) During the 2020–2024 Period

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ABSTRACT

Financial performance reflects a company's ability to manage and control its financial resources to achieve business objectives effectively and efficiently. It serves as a crucial indicator to assess the extent to which a company can generate profits and maintain financial stability. This study aims to analyze the effect of non-performing loans, operational efficiency, and capital adequacy ratio on the financial performance of banking companies listed on the Indonesia Stock Exchange during the 2020–2024 period. This research employs a quantitative approach using secondary data in the form of annual reports from 33 banking companies selected through purposive sampling. The data analysis technique used is multiple linear regression, with data processing performed using E-Views software version 10.0. The results indicate that non-performing loans have a negative but insignificant effect on financial performance, operational efficiency has a positive and significant effect on financial performance, and capital adequacy ratio has a positive but insignificant effect on financial performance.

KEYWORDS: Non-Performing Loans, Operational Efficiency, Capital Adequacy Ratio, and Financial Performance.

1. INTRODUCTION

A bank is a financial institution that collects funds from the public in the form of deposits and redistributes these funds to the community in the form of loans or other financial instruments, with the ultimate goal of improving the overall welfare of society (Surinabila & Pratiwi, 2023). As an intermediary institution, banks play a strategic role in the economy. Through their core functions of mobilizing funds and allocating them to individuals and businesses in need, banks facilitate capital flows for investment, working capital, and consumption, thereby contributing to national economic growth (Rozie & Solihin, 2020).

The banking industry is inherently exposed to various risks, particularly due to its role in managing public funds and reallocating them into various forms of investments, such as loans, securities, and other financial placements (Utami & Silaen, 2018). This inherent risk profile necessitates regular assessments of a bank's financial health by various stakeholders. Among these stakeholders, investors play a critical role, as the bank's financial performance directly affects the security of their invested capital. Financial ratios serve as essential tools for investors to evaluate a bank's performance. These ratios provide objective, comparable metrics that enable performance evaluation not only across different banks but also over different time periods (Diantini & Gunadi, 2020).

Bank performance can be evaluated using several indicators such as average lending rates, average deposit rates, and overall profitability. However, deposit rates are considered a weaker measure and may present certain limitations. Consequently, return on Assets (ROA) is widely regarded as the most appropriate metric for assessing bank performance within the industry. ROA measures how efficiently a company utilizes its assets to generate profit, with higher ROA values indicating stronger financial performance due to higher returns on assets (Pondaag & Tulung, 2022). In conducting their operations, banks are inherently exposed to various types of risks. Business risk in banking refers to the level of uncertainty surrounding expected or projected outcomes (Utami & Silaen, 2018). Among the many risks faced by banks, credit risk often represented by the Non-Performing Loans (NPLs) ratio plays a significant role in influencing overall financial performance.

Non-Performing Loans (NPLs) refer to credit facilities that encounter repayment difficulties due to two main factors: deficiencies in the bank's credit assessment process or the borrower's deliberate or unintentional failure to meet repayment obligations (Kamsir, 2019). An increase in NPLs reflects a higher proportion of non-performing loans within the bank's credit portfolio, which negatively impacts bank income as indicated by a decline in Return on Assets (ROA) (Safitri & Hendrani, 2020). A high NPL ratio signals an elevated risk of credit default, ultimately eroding profitability (Lestari & Ernawan, 2022) and weakening the bank's financial stability, as the inability to recover disbursed funds results in financial losses (Roosmawarni & Mauliddah, 2021).

Operational efficiency, commonly measured by the Operating Expenses to Operating Income ratio (BOPO), reflects a bank's ability to manage its operational activities effectively. An increase in the BOPO ratio indicates a decline in the bank's operational management capability. Higher operational costs directly reduce pre-tax profits, ultimately diminishing overall bank performance (Nurkhalifa & Machpudin, 2021). The BOPO ratio, often referred to as an efficiency ratio, serves as an important indicator of a bank's managerial ability to control operating expenses. The more efficient a bank is in managing its operating costs, the lower the likelihood of encountering financial distress. An optimal BOPO ratio typically ranges between 80% and 90%, with levels exceeding this range indicating potential inefficiency (Fadilah & Muniarty, 2023).

The Capital Adequacy Ratio (CAR) is a key performance indicator used to assess a bank's capital sufficiency in supporting risk-weighted assets, such as loans. CAR reflects the bank's ability to absorb potential losses arising from risky assets and to safeguard its financial stability (Ismaulina & Wulansari, 2020). Bank Indonesia has established a minimum CAR requirement of 8%. A higher CAR, in accordance with regulatory standards, indicates that the bank has sufficient capital to finance its operations and absorb losses, thereby positively contributing to its overall financial performance (Hidayati & Rispantyo, 2021).

This study aims to examine the influence of non-performing loans, operational efficiency, and capital adequacy ratio on the financial performance of banking firms listed on the Indonesia Stock Exchange during the 2020–2024 period. The findings of this research are expected to contribute to the academic literature, particularly in the fields of finance and banking, and to serve as a practical reference for bank management in addressing credit risk, enhancing operational efficiency, and maintaining adequate capital levels to improve financial performance.

2. LITERATURE REVIEW

2.1. Theory

To strengthen, support, and achieve more robust and comprehensive research findings, this study on banking companies listed on the Indonesia Stock Exchange (IDX) draws upon several grand theories, as follows:

2.1.1. Accounting Theory

The accounting theory developed by Watts and Zimmerman (1986) posits that managerial choices in accounting practices are influenced by economic motivations and contractual interests, such as maintaining creditor relationships, maximizing managerial bonuses, or avoiding political pressure. Rather than prescribing how accounting should be conducted, this theory seeks to explain and predict actual accounting behavior. This perspective is particularly relevant in the context of non-performing loans (NPLs), as managerial decisions in reporting and managing NPLs may reflect specific economic interests. NPLs, which represent impaired loans that no longer generate income, directly affect the financial performance of banks or financial institutions, particularly Return on Assets (ROA). Under accounting theory, management may be incentivized to strategically report or manage NPLs to maintain the firm's financial image in the eyes of investors and regulators. For example, when NPL levels increase, firms may engage in certain accounting actions, such as establishing sufficient loan loss reserves or adjusting accounting estimates, to mitigate the impact on financial statements and preserve healthy financial ratios.

2.1.2. Theory of Efficient Market Hypothesis

The Efficient Market Hypothesis (EMH), as proposed by Fama (1970), asserts that all available information, both public and private, is instantly reflected in market prices, rendering it impossible for investors to consistently achieve above average returns without assuming additional risk. In relation to operational efficiency and financial performance, EMH suggests that when a firm enhances its operational efficiency by reducing costs, improving productivity, or optimizing resource utilization such improvements are rapidly incorporated into market expectations and reflected in financial performance indicators. In an efficient market, gains in operational

efficiency serve as positive signals to investors and stakeholders, thereby fostering favorable perceptions of the firm's financial performance.

2.1.3. Agency Theory

Agency theory, developed by Jensen and Meckling (1976), explains the relationship between principals (owners/shareholders) and agents (management/the firm) that arises due to the separation of ownership and control. This relationship inherently carries the potential for conflicts of interest, as agents may act in ways that do not fully align with the principals' interests. Agency theory becomes particularly relevant in the context of capital adequacy ratio (CAR), as CAR reflects the bank's ability to absorb potential losses and safeguard the interests of capital providers. Management (agents) maintaining a sound CAR level demonstrates a commitment to responsible risk management, which in turn enhances investor and stakeholder confidence and positively influences financial performance. A high CAR may mitigate agency conflicts by signaling prudent and transparent managerial behavior in managing capital and risk, ultimately contributing to the firm's overall financial performance.

2.2. Research Hypothesis

A hypothesis is an unproven proposition or assumption temporarily adopted to explain certain facts or phenomena, serving as a tentative answer to the research problem (Sugiyono, 2020). Based on the background, problem formulation, and the supporting theories related to non-performing loans, operational efficiency, capital adequacy ratio, and financial performance, the hypotheses proposed in this study are as follows:

2.2.1. The Influence of Non-Performing Loans on Financial Performance

A sharp increase in a bank's non-performing loans (NPL) will result in a decline in its return on assets (ROA), as ROA reflects the bank management's ability to generate overall profitability, calculated by dividing pre-tax income by total assets. As the NPL ratio rises, the bank's capacity to generate profit diminishes due to the reduction in interest income, particularly since credit constitutes one of the most significant productive assets contributing to a bank's revenue (Dirwan, 2022). The study by Putri & Kesaulya (2021) demonstrated a negative relationship between NPL and financial performance, indicating that an increase in non-performing or defaulted loans adversely affects financial performance, particularly when measured by net interest income. The higher the NPL, the lower the financial performance. This finding is further supported by Sholika & Zaki (2024), who found that NPL has a significant negative effect on ROA. This condition reflects the inherent credit risk faced by banks due to borrowers' inability to fulfill their principal and interest obligations, ultimately leading to financial losses for the bank.

H₁ : There is an influence of non-performing loans on financial performance

2.2.2. The Influence of Operational Efficiency on Financial Performance

Operational efficiency represents a company's effort to minimize operational costs, thereby reducing the consumption of resources used to achieve desired profit targets. Higher operational efficiency, indicated by a lower Operating Expenses to Operating Income ratio (BOPO), reflects stronger financial performance (Chasana & Kusumawati, 2024). The study by Gusmiarni & Nursina (2025) demonstrates that BOPO negatively affects financial performance. A high BOPO ratio signals elevated operating costs relative to income, which in turn reduces profitability as the remaining profit after operational expenses diminishes. This finding is further supported by Syahrir & Alam (2019), who reveal that operational efficiency has a positive and significant impact on financial performance. This suggests that when capital invested in assets is substantial, companies utilize these assets efficiently to generate sales, managing them prudently to avoid waste and ultimately increasing profitability. Higher earnings can then be leveraged by management to signal strong company performance to the market, eliciting a positive response from investors.

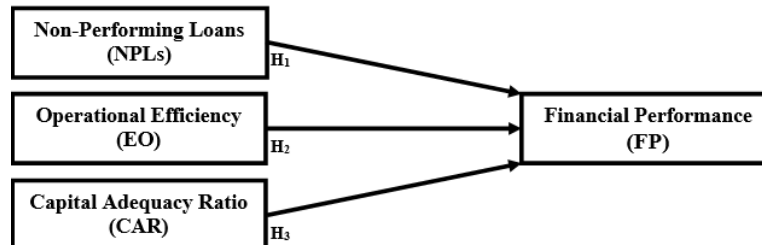
H₂ : There is an influence of operational efficiency on financial performance

2.2.3. The Influence of Capital Adequacy Ratio on Financial Performance

The capital adequacy ratio (CAR) is a key financial metric used to assess a bank's capital sufficiency in supporting assets that contain or generate risk, such as loans. In accordance with regulations set by Bank Indonesia, banks are required to maintain a minimum capital adequacy ratio of 8%. CAR is calculated by comparing a bank's capital comprising core capital and supplementary capital to its risk-weighted assets (Wahyuni, 2017). The study by Amaniya & Cahyono (2024) indicates that CAR has a significant impact on financial performance. A higher CAR reflects greater capital sufficiency to support risk-weighted assets, enabling banks to absorb potential losses

and maintain financial stability. Strong capital buffers enhance a bank's capacity to mitigate losses arising from risky productive assets such as credit exposures, ultimately improving financial performance. This finding is further supported by Hidayati & Rispantyo (2021), who demonstrate that CAR has a positive and significant effect on banks' financial performance. Their study emphasizes that a bank's ability to sustain adequate capital levels, combined with effective management in identifying, measuring, monitoring, and controlling emerging risks, leads to stronger financial outcomes.

H₃ : There is an influence of capital adequacy ratio on financial performance



3. RESEARCH METHODS

Research is fundamentally conducted to reveal the truth and to provide solutions to the problems under investigation. To achieve these objectives, an appropriate and relevant research methodology must be employed. This study adopts a quantitative research approach. Quantitative research is based on the positivist philosophy, focusing on the investigation of specific populations or samples, with data collection carried out through structured research instruments. The data are analyzed quantitatively or statistically, aiming to test predetermined hypotheses (Sugiyono, 2020). This study employs multiple linear regression analysis, as the dependent variable is influenced by several independent variables. The research model consists of four variables: the independent variables are non-performing loans, operational efficiency, and capital adequacy ratio, while the dependent variable is financial performance.

In this study, secondary data were utilized, consisting of annual reports from banking sector companies listed on the Indonesia Stock Exchange (IDX) for the period 2020–2024. The data were obtained from the official IDX website (www.idx.co.id) and the respective company websites. The study population comprised banking sector companies, and through purposive sampling, a total of 33 banking companies listed during the 2020–2024 period were selected as the research sample based on predetermined criteria.

Table 1. Identification and Measurement Variable

Variable	Type	Proxies	Symbol	Definition of Variable	Operational
Financial Performance	Dependent	<i>Return on assets derived from profit and total assets</i>	ROA	Financial Performance as the Firm's Ability to Generate Profit and Manage Financial Resources	ROA: Pre-Tax Income/ Total Assets
Non-Performing Loans	Independent	Non-performing loans derived from credit risk	NPL	Non-performing loans that remain unpaid by borrowers beyond their contractual due dates	NPL: Total Non-Performing Loans / Total Loans
Operational Efficiency	Independent	Operating expenses and operating income	BOPO	Operational efficiency, the ability to manage costs in order to achieve optimal outcomes	BOPO: Total Operating Expenses/ Total Operating Income
Capital Adequacy Ratio	Independent	Capital adequacy from financial risk	CAR	Capital adequacy ratio reflecting the bank's capital strength in relation to risk exposure	CAR: Capital/ Risk-Weighted Assets

4. RESEARCH RESULTS AND DISCUSSION

4.1. Panel Data Model Selection

There are three estimation approaches in the panel data model selection process: The Common Effect Model (CEM), the Fixed Effect Model (FEM), and the Random Effect Model (REM). The subsequent step involves selecting the most appropriate model to ensure robust analysis by employing the Chow test (CEM vs. FEM), the Hausman test (REM vs. FEM), and the Lagrange Multiplier test (CEM vs. REM). The following presents the panel data model estimation results utilized in this study.

4.1.1. Chow Test

The Chow test is employed to determine whether panel data is more appropriately analyzed using the Common Effect Model (CEM) or the Fixed Effect Model (FEM). The hypotheses for the Chow test are defined as follows: H_0 (the data is consistent with the CEM), and H_1 (the data is consistent with the FEM).

Table 2. Results of the Chow Test

Note	Prob Cross-Section F	α
Chow Test	0,0009	0,05

Source: Output *e-views 10*

Based on the results of the panel data model selection test, the Chow test yielded a cross-section F probability value of 0.0000, which is lower than the significance level of $\alpha = 0.05$. Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. This indicates that the fixed effect model (FEM) is more appropriate than the common effect model (CEM) for this study.

4.1.2. Hausman Test

The Hausman test is employed to determine whether the panel data is more appropriately analyzed using the fixed effect model (FEM) or the random effect model (REM). The hypotheses for the Hausman test are as follows: H_0 (the data is better suited for the REM) and H_1 (the data is better suited for the FEM).

Table 3. Results of the Hausman Test

Note	Prob Cross-Section Random	α
Hausman Test	0,6523	0,05

Source: Output *e-views 10*

Based on the results of the panel data model selection test, the Hausman test yields a cross-section random probability value of 0.6523, which is greater than the significance level of $\alpha 0.05$. Therefore, it can be concluded that the research hypothesis accepts H_0 and rejects H_1 . This indicates that the most appropriate model is the Random Effects Model (REM) compared to the Fixed Effects Model (FEM).

4.1.3. Lagrange Multiplier Test

The Lagrange Multiplier test is employed to determine whether the data should be analyzed using the Common Effects Model (CEM) or the Random Effects Model (REM). The hypotheses for the Lagrange Multiplier test are as follows: H_0 (the data fit the CEM) and H_1 (the data fit the REM).

Table 4. Results of the Lagrange Multiplier Test

Note	Breusch-Pagan Cross-Section One-Sided	α
Lagrange Multiplier Test	0,0000	0,05

Source: Output *e-views 10*

Based on the results of the panel data model selection tests, the Lagrange Multiplier test yielded a Breusch-Pagan cross-section one-sided probability value of 0.0000, which is lower than the significance level of $\alpha = 0.05$. Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted, indicating that the Random Effect Model (REM) is the most appropriate model. In conclusion, based on the results of the Chow test, Hausman test, and Lagrange Multiplier test, the Random Effect Model (REM) was selected as the most suitable model and will be used for subsequent analysis.

4.2. Multiple Linear Regression Analysis

Multiple linear regression is a commonly used statistical method to examine the relationship between independent variables (X) and a dependent variable (Y). In this study, data were analyzed using multiple linear regression with the Random Effects Model (REM) for the period from 2020 to 2024. The data processing was conducted with the assistance of E-Views software version 10.0.

Table 5. Results of Multiple Linear Regression Using the Random Effects Model (REM)

Research Variables	Coefficient	Note
Constant	0,0151	Positif
Non-Performing Loans (NPLs) → Financial Performance (FP)	-0,0701	Negatif
Operational Efficiency (EO) → Financial Performance (FP)	0,0085	Positif
Capital Adequacy Ratio (CAR) → Financial Performance (FP)	0,0012	Positif

Source: Output *e-views 10*

Based on the data presented in Table 5, the regression equation for this study can be formulated as follows:

$$FP_{it} = 0,0151\alpha - 0,0701NPLs_{it} + 0,0085EO_{it} + 0,0012CAR_{it}$$

The results of the linear regression equation indicate that the constant has a positive value of 0.0151, suggesting that if all independent variables are equal to zero, the estimated value of Financial Performance (FP) would be 0.0151. The Non-Performing Loans (NPLs) variable has a coefficient of -0.0701, indicating a negative effect on Financial Performance (FP); thus, a one percent increase in NPLs would lead to a decrease in FP. Conversely, Operational Efficiency (OE) has a coefficient of 0.0085, indicating that a one percent increase in OE would result in a positive increase in FP. The Capital Adequacy Ratio (CAR) exhibits a coefficient of 0.0012, suggesting that a one percent increase in CAR would lead to a positive increase in Financial Performance (FP).

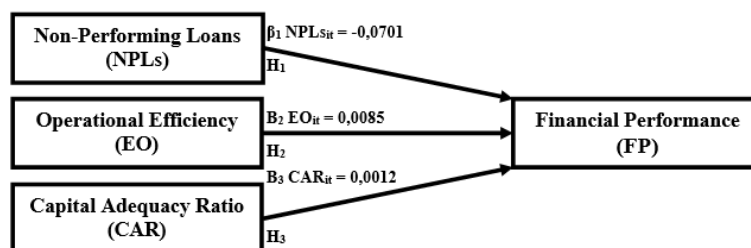


Figure 1. Multiple Linear Regression Using the Random Effect Model (REM)

4.3. Hypothesis Test

4.3.1. Model Feasibility (Goodness of Fit)

The model feasibility test (goodness of fit) is employed to assess the adequacy of a regression model. The goodness of fit evaluation is conducted using the F-statistic test. The hypotheses for the F-statistic test are as follows: H_0 (the model is not feasible) and H_1 (the model is feasible).

Table 6. Results of Goodness of Fit (F-Test)

Research Variables	F _{hitung}	F _{tabel}	Probability	α	Note
Non-Performing Loans (NPLs), Operational Efficiency (OP), Capital Adequacy Ratio (CAR) → Financial Performance (FP)	3,5421	2,66	0,0160	0,05	Goodness of Fit

Source: Output *e-views 10*

The results of the model feasibility test (goodness of fit) indicate that the calculated F-value ($F = 3.5421$) exceeds the critical F-table value (2.66), and the probability value ($p = 0.0160$) is less than the significance level ($\alpha = 0.05$). Therefore, the null hypothesis (H_0) is rejected, and the alternative hypothesis (H_1) is accepted. This suggests that Non-Performing Loans (NPLs), Operational Efficiency (OE), and Capital Adequacy Ratio (CAR) have a statistically significant influence on Financial Performance (FP). These findings provide empirical and theoretical support for the proposed research model, as the calculated F-value exceeds the F-table value and the probability value falls below the significance threshold, indicating a satisfactory goodness of fit for the model.

4.3.2. Coefficient of Determination (R^2)

The coefficient of determination (R^2) test assesses the extent to which the model can explain the variability of the dependent variable based on the independent variables. The hypothesis for the R^2 test is formulated as follows: H_0 (the model is inadequate and the independent variables fail to sufficiently explain the dependent variable) and H_1 (the model is adequate and the independent variables significantly influence the dependent variable).

Table 7. Results of the Coefficient of Determination (R^2)

Research Variables	R-squared
Non-Performing Loans (NPLs), Operational Efficiency (OP), Capital Adequacy Ratio (CAR) → Financial Performance (FP)	0,5619

Source: Output *e-views 10*

The results of the coefficient of determination (R-squared) test for Non-Performing Loans (NPLs), Operational Efficiency (OE), and Capital Adequacy Ratio (CAR) indicate an R-squared value of 0.5619 or 56.19%. This suggests that 56.19% of the variation in Financial Performance (FP) is explained by the three independent variables NPLs, OE, and CAR while the remaining 43.81% is attributed to other factors outside the regression model. Thus, the hypothesis testing rejects H_0 and accepts H_1 , indicating that the proposed model is appropriate and that the independent variables have a substantial influence on the dependent variable.

4.3.3. Partial Test (t-Test)

The partial test (t-test) essentially assesses the extent to which an individual explanatory (independent) variable significantly explains variations in the dependent variable. The analysis is conducted using the t-statistic. The hypotheses for the t-test are formulated as follows: H_0 (the independent variable does not have a significant effect) and H_1 (the independent variable has a significant effect).

Table 8. Results of the Partial Test (t-Test)

Research Variables	t_{hitung}	t_{tabel}	Probability	α	Note
Non-Performing Loans (NPLs) → Financial Performance (FP)	-0,7032	1,9748	0,4829	0,05	Not Significant
Operational Efficiency (OP) → Financial Performance (FP)	3,0934	1,9748	0,0023	0,05	Significant
Capital Adequacy Ratio (CAR) → Financial Performance (FP)	1,4378	1,9748	0,1524	0,05	Not Significant

Source: Output *e-views 10*

1. The first hypothesis proposed in this study states that H_1 : Non-Performing Loans (NPLs) has a significant effect on Financial Performance (FP). Based on the results of the partial test (t-test), Non-Performing Loans (NPLs) yields a t-statistic value of -0.7032, which is lower than the t-table value of 1.9748, and a probability value of 0.4829, which exceeds the significance level α of 0.05. Therefore, it can be concluded that this study fails to reject H_0 and rejects H_1 , as the t-statistic is lower than the t-table value and the probability value exceeds the significance threshold. This indicates that Non-Performing Loans (NPLs) does not have a significant effect on Financial Performance (FP).
2. The second hypothesis proposed in this study posits that H_2 : Operational Efficiency (OE) has a significant effect on Financial Performance (FP). Based on the results of the partial test (t-test), Operational Efficiency (OE) yields a t-statistic value of 3.0934, which exceeds the t-table value of 1.9748, and a probability value of 0.0023, which is below the significance level α of 0.05. Therefore, it can be concluded that this study rejects H_0 and accepts H_1 , as the t-statistic is greater than the t-table value and the probability value is lower than the significance threshold. This indicates that Operational Efficiency (OE) has a significant effect on Financial Performance (FP).
3. The third hypothesis proposed in this study posits that H_3 : Capital Adequacy Ratio (CAR) has a significant effect on Financial Performance (FP). Based on the results of the partial test (t-test), Capital Adequacy Ratio (CAR) produces a t-statistic value of 1.4378, which is lower than the t-table value of 1.9748, and a probability value of 0.1524, which exceeds the significance level α of 0.05. Therefore, it can be concluded that this study accepts H_0 and rejects H_1 , as the t-statistic is lower than the t-table value and the probability value is greater than the significance threshold. This suggests that Capital Adequacy Ratio (CAR) does not have a significant effect on Financial Performance (FP).

4.4. Discussion

Based on the analysis presented previously, this section discusses the results of hypothesis testing individually.

4.4.1. The Influence of Non-Performing Loans on Financial Performance

The findings reveal a negative but statistically insignificant effect of Non-Performing Loans (NPLs) on Financial Performance (ROA) among 33 banking sector firms listed on the Indonesia Stock Exchange (IDX). In accounting theory, NPLs serves as an indicator for assessing the quality of a bank's credit assets, while ROA reflects management's efficiency in utilizing assets to generate profits. Theoretically, higher NPLs levels are expected to deteriorate financial performance, as interest income declines and loan loss provisions increase. However, in this study, although the effect is negative, it fails to reach statistical significance.

This phenomenon can be explained from the perspective that modern banking has developed more sophisticated and efficient risk management systems. The implementation of prudential principles, expected credit loss-based provisioning systems, and credit portfolio diversification enables banks to maintain profitability stability even amid rising NPLs levels. In other words, when NPLs increases, banks generally have sufficient buffers in the form of allowance for impairment losses (provisions), thereby mitigating the immediate and direct impact on ROA. Furthermore, the insignificant relationship between NPLs and ROA may also be attributed to scale effects and non-credit income sources, such as fee-based income or investment gains from securities. Large banks typically possess diversified revenue streams that are not solely reliant on interest income. Consequently, an increase in NPLs within specific credit portfolios does not necessarily lead to a significant decline in ROA, as profitability remains supported by these alternative income sources.

As a theoretical foundation within financial accounting, this explanation aligns with Positive Accounting Theory developed by Watts and Zimmerman (1986). This theory posits that firms, including banks, tend to select accounting policies that minimize disruptions to financial performance, such as managing loss provisions based on expected losses rather than solely on actual losses. This theoretical perspective supports the finding that despite an increase in Non-Performing Loans (NPLs), firms can maintain their financial performance (ROA) through appropriate accounting strategies. The present study's results are consistent with Nugroho (2023), who found a negative but insignificant effect of NPLs on ROA among 40 conventional commercial banks in Indonesia during the period 2018–2022. They explained that the insignificance arises from banks' ability to manage credit risk effectively through robust risk management systems and the adoption of PSAK 71, which is based on expected credit loss. These banks are deemed to hold adequate buffers in the form of loan loss provisions, thereby mitigating the immediate and substantial impact of rising NPLs on earnings. Additionally, revenue support from non-credit sectors, such as fee-based income, further weakens the significant influence of NPLs on ROA. Similarly, Rahmawati (2024) reported comparable findings in their study of book 4 category banks in Indonesia, demonstrating a negative but insignificant relationship between NPLs and ROA. They emphasized that large banks possess more complex and diversified income structures alongside high operational efficiency, enabling sustained financial performance even as problem loan ratios increase. Furthermore, regulatory relaxation from the Financial Services Authority (OJK), including credit restructuring policies during the pandemic, is considered to have softened the direct short-term impact of NPLs on bank profitability.

4.4.2. The Influence of Operational Efficiency on Financial Performance

The findings of this study demonstrate a positive and significant relationship between Operational Efficiency (BOPO) and Financial Performance (ROA) among 33 banking sector firms listed on the Indonesia Stock Exchange (IDX). In this context, BOPO (Operating Expenses to Operating Income Ratio) reflects the bank's ability to manage operating expenses in order to preserve its core revenue. A lower BOPO ratio indicates higher operational efficiency, whereas a higher ratio suggests inefficiency. Therefore, as operational efficiency improves, the profits generated from assets increase correspondingly, leading to a higher Return on Assets (ROA).

This phenomenon underscores the critical role of cost efficiency in determining the profitability of banking institutions. In financial accounting, particularly in financial statement analysis, the BOPO ratio serves as a key indicator for evaluating the structure of operating costs. Banks that successfully control operational expenses such as personnel costs, depreciation, and marketing expenses can maximize profit margins derived from their revenues. Thus, efficiency becomes a central determinant in generating financial value, as reflected in profitability ratios like Return on Assets (ROA). The significant positive relationship further highlights that modern banks no longer rely solely on credit expansion but increasingly depend on internal management and process efficiency. Digital banking technologies, process automation, and integrated accounting information systems have played pivotal roles in reducing manual and administrative costs. From a financial accounting perspective, cost control supported by accurate and real-time recording systems also contributes to more stable and transparent profit

reporting. Moreover, ROA reflects a bank's capability to generate net income from its total assets. As operational efficiency improves and the BOPO ratio declines, the cost burden on revenue decreases, resulting in higher net income derived from asset utilization. This indicates that banks are able to optimize their asset management without burdening them with unnecessary expenses, ultimately achieving sound financial performance. From an accounting standpoint, the *matching principle* further explains that expenses should be recognized in the same period as the revenues they help generate. Effective cost control ensures that expenditures contribute directly to relevant income streams, leading to financial statements that accurately and efficiently reflect the bank's performance. Higher efficiency implies that profits increase as fewer expenses are wasted or deemed irrelevant.

As a theoretical foundation, these findings can be linked to the Efficient Market Hypothesis (EMH) proposed by Eugene Fama (1970). Although EMH is predominantly applied in the context of capital markets, within the domain of financial accounting, it emphasizes that efficient information including operational efficiency reported in financial statements is immediately reflected in a firm's value or performance indicators. Accordingly, operational efficiency as captured by the BOPO ratio serves as a clear performance signal for profitability metrics such as Return on Assets (ROA). This theory underscores the importance of timely and accurate accounting information in reflecting the true condition and value of firms from the perspective of investors and the broader market. The results of this study are consistent with prior research by Andriani and Ramadhan (2023), who confirmed that operational efficiency, as measured by the BOPO ratio, exerts a positive and significant influence on ROA among conventional commercial banks in Indonesia during the 2019–2022 period. They argued that when banks effectively suppress operational expenses, the proportion of profit relative to assets increases. This efficiency is achieved through the implementation of banking technologies, streamlined organizational structures, and optimized operational burdens, resulting in a lower BOPO ratio. A declining BOPO ratio reflects successful cost management, which directly enhances profitability. Similarly, Nugraha and Marlina (2022) identified a positive and significant relationship between BOPO and ROA in the Islamic banking sector in Indonesia. They emphasized that strict adherence to Sharia compliant cost management principles fosters sustained operational efficiency. Their findings suggest that efficiency, as reflected in a low BOPO ratio, indicates sound and accountable financial performance, thereby enhancing positive investor perceptions of the bank's performance. This underscores that cost efficiency constitutes a vital instrument in optimizing assets and increasing net income, as reported in banks' financial statements.

4.4.3. The Influence of Capital Adequacy Ratio on Financial Performance

The results of the study indicate a positive but statistically insignificant relationship between the Capital Adequacy Ratio (CAR) and Financial Performance (ROA) across 33 banking sector firms listed on the Indonesia Stock Exchange (IDX). CAR serves as a key indicator reflecting the robustness of a bank's capital structure in absorbing potential credit, market, and operational risks. In theory, a higher CAR implies greater capital buffers to mitigate unexpected losses. However, the finding that CAR exhibits a positive yet insignificant effect on ROA suggests that strong capitalization does not necessarily translate into improved profitability. In practice, banks with higher capital adequacy may not always deploy their assets productively to generate earnings. This underscores the notion that while a strong capital base (as reflected in CAR) enhances a bank's resilience against risk, it does not inherently guarantee efficient asset utilization or aggressive credit expansion policies factors that more directly drive ROA.

This phenomenon can be interpreted from the perspective of financial accounting through the lens of accounting conservatism, where banks with high CAR levels tend to adopt more cautious approaches in extending credit or undertaking investment risks. In this context, such banks prioritize long-term financial stability over maximizing short-term profitability. Therefore, while a high CAR provides greater assurance against financial risks, it does not automatically lead to significant increases in net income, which serves as the numerator in the calculation of ROA. Moreover, strict banking regulations also play a role in mediating the relationship between CAR and ROA. The Financial Services Authority (OJK) in Indonesia enforces minimum CAR thresholds to maintain the stability of the financial system. Banks maintaining capital ratios well above the regulatory minimum often accumulate substantial capital reserves, but at times this may come at the expense of potential profitability, as they forgo the opportunity to channel funds into more profitable lending or investment activities. This contributes to the observed insignificance of CAR's effect on ROA. From a capital efficiency standpoint, excessive capitalization that is not productively deployed may actually reduce financial efficiency. ROA reflects the ability of a bank to generate net income from its total assets; thus, if excess capital is not effectively transformed into productive assets, ROA will remain suppressed. This underscores that asset management and the efficient utilization of capital are far more critical in enhancing profitability than the mere accumulation of capital buffers.

As a theoretical foundation for the above explanation, Agency Theory, as developed by Jensen and Meckling (1976), can be employed. In the context of banking, this theory posits that conflicts of interest between owners (principals) and managers (agents) may influence decisions related to capital structure and its utilization. A bank with a strong capital base (high CAR) does not necessarily achieve superior performance (ROA) if management fails to allocate capital productively. This provides a rationale for the observed positive but statistically insignificant relationship, as the effectiveness of capital utilization largely depends on the bank management's policies and decision-making behavior. The findings of this study are consistent with those of Rahmadani and Yuliana (2023), who reported a positive yet insignificant relationship between Capital Adequacy Ratio (CAR) and Return on Assets (ROA) in conventional banks listed on the Indonesia Stock Exchange during the 2018–2022 period. Their findings indicate that while strong capitalization may enhance financial stability, it does not automatically translate into improved profitability. The authors noted that many highly capitalized banks adopt conservative credit expansion strategies, thereby limiting the potential returns on assets. This insignificance is interpreted as a consequence of risk management approaches that prioritize long-term stability over aggressive expansion. Similarly, Wijayanti and Prasetyo (2022), focusing on Islamic banking institutions in Indonesia, found that while CAR has a positive influence on ROA, the relationship remains statistically insignificant. They explained that in Islamic banks, capital is often allocated toward strengthening risk reserves rather than directly generating income through productive financing activities. This aligns with the prudential principles and risk-sharing mechanisms inherent in Islamic finance, which may result in high CAR levels not automatically driving increases in net income derived from total assets. These findings underscore that although capital strength is crucial for long-term financial security, the effectiveness of capital deployment remains the key determinant in generating financial value.

5. CONSLUSION AND RECOMMENDATIONS

5.1. Conclusion

Based on the results and discussions presented in the preceding sections, several conclusions can be drawn as follows:

1. Based on the research findings, it can be concluded that Non-Performing Loans (NPLs) have a negative but statistically insignificant effect on Return on Assets (ROA) among banking sector firms listed on the Indonesia Stock Exchange. This finding suggests that although, from a theoretical standpoint, an increase in NPLs is expected to deteriorate financial performance, empirically the effect is not sufficiently strong to directly impair profitability.
2. Based on the research findings, it can be concluded that operational efficiency, as reflected by the BOPO ratio (Operating Expenses to Operating Income), has a positive and significant effect on banks' financial performance, particularly Return on Assets (ROA), among banking sector firms listed on the Indonesia Stock Exchange. A lower BOPO ratio indicates more efficient cost management, which consequently enhances net income generated from asset utilization.
3. Based on the research findings, it can be concluded that the Capital Adequacy Ratio (CAR) has a positive but statistically insignificant effect on Return on Assets (ROA). This suggests that while a strong capital base enables banks to absorb potential risks, it does not directly enhance profitability unless accompanied by efficient asset management and productive expansion policies.

5.2. Recommendations

Based on the observed issues described above, the following recommendations are proposed for the relevant stakeholders:

1. Banks should continuously strengthen credit risk management and diversify income sources to maintain financial performance stability, even in the face of rising levels of Non-Performing Loans (NPLs).
2. Indonesian banks whether conventional, Islamic, or digital are advised to continuously enhance operational efficiency by optimizing technology utilization, streamlining business processes, and strengthening cost control systems.
3. Banks should not only concentrate on meeting and increasing the Capital Adequacy Ratio (CAR) as a regulatory requirement but also focus on optimizing the productive utilization of capital by channeling funds into high value-added and low-risk sectors.

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