

## THE EFFECT OF FINANCIAL RISK AND BANK CHARACTERISTICS ON FINANCIAL PERFORMANCE OF INDONESIAN BANKS



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### Abstract

This study aims to analyze the influence of Financial Risks (Credit Risk and Liquidity Risk) and Bank Characteristics (Capital, Size, Loan Growth, and Cost Efficiency) on the Financial Performance of conventional commercial banks in Indonesia. The study employs a quantitative approach using panel data from 36 banks listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. Data analysis was conducted using EViews 9 software with the Fixed Effect Model (FEM) for ROAA and the Random Effect Model (REM) for NIM. The findings reveal that Cost Efficiency (BOPO) has a consistent and significant negative effect on both ROAA and NIM. Credit Risk (NPL) and Bank Capital significantly affect NIM but have no impact on ROAA. Meanwhile, Liquidity Risk, Bank Size, and Loan Growth do not significantly influence financial performance. Operational efficiency is identified as the most critical driver of banking profitability in Indonesia.

**Keywords:** Financial Performance, Credit Risk, Cost Efficiency, Indonesian Banking

## INTRODUCTION

The banking sector serves as a systemic backbone in a country's economy, functioning as a primary intermediary that channels resources from surplus units to deficit units (Ma'aji et al., 2025). This intermediation function is essential in driving economic growth, creating employment, and fostering financial stability (Luo et al., 2021). In the modern financial landscape, particularly following the post-pandemic recovery and global economic volatility, the focus of banking management has shifted significantly. It is no longer solely about asset expansion but rather the integration of robust risk management within the profit maximization framework. The implementation of Basel III standards globally has further emphasized the necessity for banks to strengthen capital and liquidity buffers to withstand economic shocks (Chen, 2020), making the balance between risk capability and financial performance a critical subject of study for academics and practitioners alike.

Financial performance, commonly measured through Return on Average Assets (ROAA) and Net Interest Margin (NIM), serves as a key indicator of a bank's resilience. High profitability acts as a "shock absorber" during economic downturns, allowing banks to build reserves and support lending activities even in stressed conditions. Conversely, low profitability can amplify systemic vulnerability, leading to solvency issues (Laporšek et al., 2024). Therefore, maintaining optimal performance is not merely a corporate goal for shareholders but a regulatory necessity to ensure the stability of the broader financial ecosystem. However, achieving this performance is increasingly challenging due to the complex interplay between external financial risks and internal bank characteristics.

Financial risk, particularly Credit Risk and Liquidity Risk, represents a fundamental challenge in banking operations. The "bad management" theory suggests that poor credit decisions, reflected in high Non-Performing Loans (NPL), directly erode profitability due to impairment costs and the cessation of interest income (Anh & Huong, 2024). Similarly, liquidity risk presents a strategic trade-off; while high liquidity buffers ensure stability and public trust, they may reduce the opportunity for banks to generate higher returns from aggressive lending, known as the "high risk, high return" paradigm (Kalimashi et al., 2022). Previous findings by Ma'aji et al. (2025) in frontier markets and Laporšek et al. (2024) in developed European markets indicate that while banks have improved their risk management frameworks, the impact of these risks on ROAA and NIM remains dynamic, context-dependent, and often contradictory.

Beyond risk, specific bank characteristics namely Capital, Bank Size, Loan Growth, and Cost Efficiency are pivotal determinants of performance. Capital acts as a buffer against losses, where strong capitalization is generally associated with higher profitability due to lower funding costs (Aliyu et al., 2020). Meanwhile, the effect of Bank Size and Loan Growth is often debated in the literature. Larger banks may benefit from economies of scale, reducing average costs, or conversely, suffer from "diseconomies of scale" due to bureaucratic inefficiencies that lower ROAA (Abdullahi & Usman, 2017). Furthermore, operational efficiency, measured by the cost-to-income ratio (or BOPO in Indonesia), is cited as a critical factor, where inefficiency is consistently linked to poor financial outcomes (Rakshit, 2021; Singh & Thaker, 2020).

Despite the extensive literature on banking performance, empirical results remain inconsistent, creating a significant research gap that requires further investigation. For instance, while Hussain & Rasheed (2022) found a significant negative impact of NPL on ROA, Ma'aji et al. (2025) found the impact to be insignificant. Similarly, regarding bank size, some studies support the positive effect of size, while others support the negative effect due to complexity. These inconsistencies suggest that the influence of financial risk and bank characteristics is not universal and may vary significantly depending on the market context, regulatory environment, and the specific period of observation.

In the context of Indonesia, the banking sector has shown resilience amidst global volatility. According to recent data from the Financial Services Authority (OJK, 2025), as of December 2024, Indonesian commercial banks recorded total assets of Rp12,461 trillion with a healthy ROAA of 2.69% and NPL maintained at a low level of 2.08%. While these aggregate figures appear robust, they may mask underlying variances in how individual banks manage risk and efficiency to achieve these results. The contradiction between theoretical predictions (which assume rationality) and the varying empirical evidence (which reflects market friction), combined with the strategic importance of the Indonesian banking sector as an emerging market leader, underscores the urgency of this research.

This study aims to comprehensively analyze the effect of financial risk (Credit Risk, Liquidity Risk) and bank characteristics (Capital, Size, Loan Growth, Efficiency) on the financial performance of banks listed on the Indonesia Stock Exchange (IDX). By addressing the existing gaps in the literature and utilizing recent panel data, this research is expected to provide strategic insights for bank management in balancing risk and profitability, as well as contributing to the academic discourse on banking stability in emerging markets.

## REVIEW OF LITERATURE

### Theoretical Framework

This study adopts two fundamental theories that remain highly relevant in modern banking literature: Agency Theory and Signaling Theory. Agency Theory Originated by Jensen and Meckling (1976), Agency Theory explains the conflict of interest between principals (shareholders) and agents (management). In the context of contemporary banking, Ma'aji et al. (2025) reaffirm the relevance of this theory, arguing that information asymmetry often drives managers to prioritize short-term lending expansion over long-term asset quality, potentially leading to high Non-Performing Loans (NPL). This theory provides the lens to analyze how operational inefficiency (high BOPO), as a form of agency cost, directly erodes the bank's financial performance (ROAA and NIM).

Signaling Theory Proposed by Spence (1973), Signaling Theory focuses on reducing information asymmetry through observable signals. In recent empirical studies, Laporšek et al. (2024) apply this framework to the banking sector, suggesting that financial ratios serve as critical signals to the market. A high Capital Adequacy Ratio (CAR) or strong liquidity position signals resilience, which Aliyu et al. (2020) argue can lower the cost of funds and improve margins. Conversely, deteriorating efficiency signals poor governance, negatively impacting investor confidence and profitability.

## **Factors Affecting Banking Financial Performance**

The banking sector functions as the central artery of a country's economic system. Ma'aji et al. (2025) argue that the stability and financial performance of banks are direct prerequisites for operational continuity. To capture a comprehensive view of this performance, this study adopts Return on Average Assets (ROAA) to reflect the overall efficiency of asset utilization (Katsiampa et al., 2019) and Net Interest Margin (NIM) to measure the profitability of the core intermediation business (Batten & Vo, 2019).

### **Credit Risk**

Measured by Non-Performing Loans (NPL), it reflects the probability of borrower default. Saleh & Abu Afifa (2020) demonstrate that a high NPL ratio significantly erodes financial results by necessitating higher loan loss provisions. This negative impact is corroborated by Fabien & Tarus (2025), who found that deteriorating asset quality directly reduces net income. Alnabulsi et al. (2023) observed a similar linear negative relationship between NPL and NIM. However, Anh & Huong (2024) present a different perspective, indicating that credit risk may have an insignificant impact on profitability in certain contexts if banks have sufficient loan loss reserves.

### **Liquidity Risk**

Kalimashi et al. (2022) posit that robust liquidity management is essential for fostering stability, yet holding excessive liquid assets can incur opportunity costs. Sutrisno (2025) found that higher liquidity improves profitability (ROAA) by reducing the cost of financial distress. In contrast, Abbas et al. (2019) noted that banks with high liquidity buffers might adopt conservative lending practices, which potentially compress interest margins.

### **Bank Capital**

Aliyu et al. (2020) argue that well-capitalized banks are generally more profitable because they benefit from lower funding costs (signaling effect). Laporšek et al. (2024) confirm that strong capitalization positively influences financial returns. Meanwhile, Bank Size remains a subject of debate. Hussain & Rasheed (2022) support the "Economies of Scale" hypothesis, arguing that larger banks benefit from cost advantages. Conversely, Abdullahi & Usman (2017) support the "Diseconomies of Scale" hypothesis, where increased size leads to bureaucratic complexity and higher overheads.

### **Loan Growth**

Loan Growth represents the bank's strategy for asset expansion and market penetration. While rapid loan expansion theoretically boosts interest income, Anh & Huong (2024) warn that excessive growth can often lead to compromised credit quality and increased risk volatility. This presents a classic risk-return trade-off; growth must be managed prudently. If Loan Growth outpaces the bank's capability to assess and manage credit risk, the resulting increase in NPLs will ultimately neutralize or even negate the initial income gains.

### **Operational Efficiency**

Critical reflection of strategic management capability and a fundamental prerequisite for superior financial performance. Rakshit (2021) highlights that Cost Efficiency, typically proxied by the Cost-to-Income Ratio (BOPO), is the key determinant. Lower operational costs relative to income directly translate into higher profitability. The ability to generate maximum revenue with minimal operational cost remains the most effective lever for

improving a bank's ROAA and NIM, linking directly to the efficiency goals embedded in Agency Theory.

## RESEARCH METHOD

This study implements a quantitative approach using secondary data to analyze the determinants of banking financial performance. Referring to the positivistic paradigm, this research utilizes panel data combining cross-sectional and time-series observations from 2020 to 2024. The study population includes all banking companies listed on the Indonesia Stock Exchange (IDX). The sampling technique adopts purposive sampling, selecting banks that were consistently listed, provided complete financial data regarding NPL, LDR, Capital, and Profitability, and operated as conventional commercial banks (excluding Sharia and digital banks). Based on these criteria, the final sample consists of 36 banks with a total of 180 observations. The data collection was carried out by accessing annual financial reports from the IDX and OJK websites.

Data analysis uses panel data regression techniques to test the research hypotheses. Prior to the regression analysis, model selection tests were conducted to determine the most appropriate estimation model, including the Chow Test (Common vs. Fixed Effect), Hausman Test (Fixed vs. Random Effect), and Lagrange Multiplier Test (Common vs. Random Effect). Furthermore, a series of classical assumption tests including Multicollinearity and Heteroscedasticity were performed to ensure the regression model acts as the Best Linear Unbiased Estimator (BLUE). The processing of statistical data uses EViews 9 software, with the interpretation of results considering both statistical significance (t-test and F-test at  $\alpha=5\%$ ) and practical significance in the context of the Indonesian banking industry.

### Research Hypothesis

This study aims to analyze the influence of financial risks (Credit and Liquidity) and bank characteristics (Capital, Size, Growth, Efficiency) on financial performance. Based on the review of the literature and previous research, the hypotheses proposed in this study are as follows:

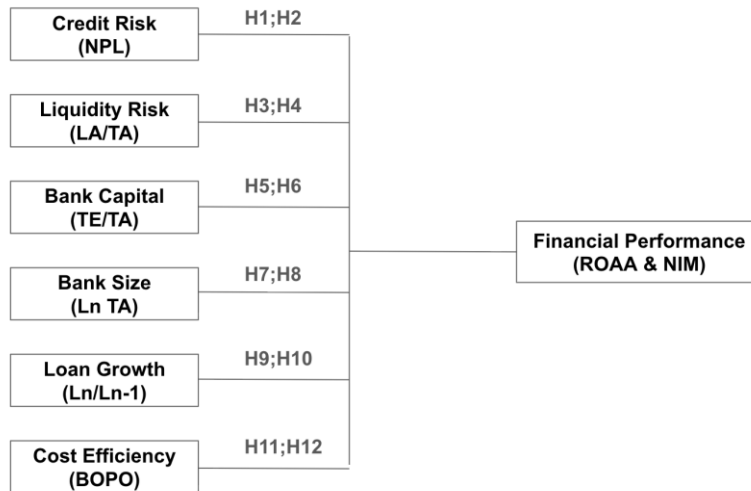
- H1: Credit Risk (NPL) has a significant effect on ROAA.
- H2: Credit Risk (NPL) has a significant effect on NIM.
- H3: Liquidity Risk (LA/TA) has a significant effect on ROAA.
- H4: Liquidity Risk (LA/TA) has a significant effect on NIM.
- H5: Bank Capital has a significant effect on ROAA.
- H6: Bank Capital has a significant effect on NIM.
- H7: Bank Size has a significant effect on ROAA.
- H8: Bank Size has a significant effect on NIM.
- H9: Loan Growth has a significant effect on ROAA.
- H10: Loan Growth has a significant effect on NIM.
- H11: Cost Efficiency (BOPO) has a significant effect on ROAA.
- H12: Cost Efficiency (BOPO) has a significant effect on NIM.

**Research Model**

This research model describes the relationship between independent variables (Financial Risks and Bank Characteristics) to dependent variables (Financial Performance). This study employs two panel data regression models as follows:

$$ROAA_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 LqRisk_{it} + \beta_3 Capital_{it} + \beta_4 Size_{it} + \beta_5 Growth_{it} + \beta_6 BOPO_{it} + \epsilon_{it}$$

$$NIM_{it} = \alpha + \beta_1 NPL_{it} + \beta_2 LqRisk_{it} + \beta_3 Capital_{it} + \beta_4 Size_{it} + \beta_5 Growth_{it} + \beta_6 BOPO_{it} + \epsilon_{it}$$



The results of this study are expected to provide deeper insights for bank management in balancing risk and efficiency to improve financial performance.

**RESULTS AND DISCUSSION**

The following are the research results obtained from the analysis using EViews 9 software. Before performing the regression analysis, model selection tests were conducted. For the ROAA model, the Chow Test indicated a significant result (Prob. 0.0000), and the Hausman Test was also significant (Prob. 0.0142), leading to the selection of the Fixed Effect Model (FEM). Conversely, for the NIM model, while the Chow Test was significant, the Hausman Test showed a probability of 0.1126 (> 0.05). Consequently, the Lagrange Multiplier Test was conducted (Prob. 0.0000), resulting in the selection of the Random Effect Model (REM).

**Table 1.**  
**Panel Data Regression Results Summary**

Variable	ROAA Model (FEM)	NIM Model (REM)
(Constant)	<b>0.0621</b> (0.5367)	<b>-0.0430</b> (0.4620)
Credit Risk (NPL)	<b>-0.0106</b> (0.8030)	<b>-0.1499</b> (0.0029)*
Liquidity Risk (LA/TA)	<b>-0.0136</b> (0.1789)	<b>-0.0142</b> (0.2271)
Bank Capital (EAR)	<b>0.0211</b> (0.1540)	<b>0.0719</b> (0.0000)*
Bank Size (LnTA)	<b>-0.0005</b> (0.8636)	<b>0.0029</b> (0.1020)
Loan Growth	<b>-0.0002</b> (0.9218)	<b>-4.6204</b> (0.9999)
Cost Efficiency (BOPO)	<b>-0.0438</b> (0.0000)*	<b>-0.0139</b> (0.0029)*
R-Squared (Adjusted)	0.8670	0.2584

<b>F-Statistic (Prob)</b>	0.0000	0.0000
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Note: Values in parentheses indicate Probability. () denotes significance at  $\alpha = 0.05$ .

Source: Data processed (2025)

### T Test

The analysis shows the influence of independent variables on financial performance based on the t-test results presented in Table 1:

1. Credit Risk (NPL): For ROAA, the probability value is 0.8030 ( $> 0.05$ ), indicating no significant effect. However, for NIM, the probability is 0.0029 ( $< 0.05$ ) with a negative coefficient of -0.1499. This means H1 is partially accepted; Credit Risk significantly reduces NIM but does not directly impact ROAA.
2. Liquidity Risk (LA/TA): The variable shows probability values of 0.1789 (ROAA) and 0.2271 (NIM). Since both are  $> 0.05$ , H2 is rejected, indicating that liquidity levels do not significantly affect financial performance in this study.
3. Bank Capital: For ROAA, the effect is insignificant (Prob. 0.1540). However, for NIM, the probability is 0.0000 ( $< 0.05$ ) with a positive coefficient of 0.0719. Thus, H3 is partially accepted; higher capital significantly boosts NIM.
4. Bank Size: The analysis yields probability values of 0.8636 (ROAA) and 0.1020 (NIM). Both are insignificant, meaning H4 is rejected. The scale of the bank does not determine its profitability.
5. Loan Growth: The growth variable shows probability values of 0.9218 (ROAA) and 0.9999 (NIM). Therefore, H5 is rejected, implying that aggressive lending expansion does not significantly impact profitability.
6. Cost Efficiency (BOPO): The coefficient is negative and significant for both ROAA (Prob. 0.0000) and NIM (Prob. 0.0029). Thus, H6 is accepted, confirming that operational inefficiency (higher BOPO) significantly reduces both ROAA and NIM.

### F Test

The F-test results show that simultaneously, all independent variables (Credit Risk, Liquidity, Capital, Size, Growth, and Efficiency) significantly affect Financial Performance. This is evidenced by the Prob(F-Statistic) value of 0.0000 for both ROAA and NIM models. Additionally, the Adjusted R-Squared values indicate that these variables can explain 86.70% of the variation in ROAA and 25.84% of the variation in NIM.

#### The Effect of Credit Risk on Financial Performance

The results of this study indicate that Credit Risk (NPL) has a significant negative effect on NIM but no effect on ROAA. This finding aligns with Ma'aji et al. (2025) and Anh & Huong (2024), who suggest that NPL's impact on ROAA might be mitigated by restructuring policies and income diversification. However, the significant negative impact on NIM supports Alnabulsi et al. (2023), indicating that higher NPLs force banks to lower interest income recognition and increase the cost of funds, thereby compressing the net interest margin.

#### The Effect of Liquidity Risk on Financial Performance

The findings show that Liquidity Risk (LA/TA) does not significantly influence financial performance (neither ROAA nor NIM). This supports Laporšek et al. (2024), who argue that liquid assets often yield low returns, thus having a neutral impact on overall profitability. While Kalimashi et al. (2022) emphasize liquidity for stability, this study finds

that within the observed period, the level of liquid assets held by Indonesian banks did not act as a primary driver for profit generation.

#### **The Effect of Bank Capital on Financial Performance**

This study finds that Bank Capital has a significant positive effect on NIM, aligning with Aliyu et al. (2020) and Abbas et al. (2019). A strong equity base reduces the bank's reliance on expensive external funding, lowering the cost of funds and widening the margin. However, its effect on ROAA is insignificant, which contradicts Sutrisno (2025). This suggests that while capital helps in core intermediation margins (NIM), other operational factors (such as overhead costs) dilute its impact on the final return on assets (ROAA).

#### **The Effect of Bank Size on Financial Performance**

The analysis indicates that Bank Size does not significantly influence profitability. This result supports Chouikh & Blagui (2017) but contradicts the "Economies of Scale" hypothesis. It implies that in the Indonesian banking sector, being larger does not automatically translate to better performance due to potential "diseconomies of scale," such as increased bureaucratic complexity and higher fixed costs that offset the benefits of size (Ma'aji et al., 2025).

#### **The Effect of Loan Growth on Financial Performance**

The results show that Loan Growth has no significant impact on performance. This finding is inconsistent with Saleh & Abu Afifa (2020) but may be explained by the risk-return trade-off. Aggressive loan growth might increase interest income, but if accompanied by higher provisions or operational costs, the net effect on ROAA and NIM becomes neutral. This highlights that the quality of growth is more important than the quantity of growth.

#### **The Effect of Cost Efficiency on Financial Performance**

The study confirms that Cost Efficiency (BOPO) has a significant negative effect on both ROAA and NIM. This means that a lower BOPO ratio (higher efficiency) leads to higher profitability. This is consistent with Rakshit (2021) and Laporšek et al. (2024). Operational inefficiency is identified as the most critical detriment to performance. Banks with high operational burdens relative to their income struggle to maintain healthy margins and returns, making cost control the most effective lever for financial improvement.

## **CONCLUSION**

Based on the research results, this study concludes that Cost Efficiency (BOPO) is the primary determinant of financial performance for conventional banks in Indonesia (2020–2024), consistently showing a significant negative impact on both ROAA and NIM. Credit Risk (NPL) and Bank Capital demonstrate asymmetric effects; they significantly influence the core intermediation margin (NIM) but do not directly drive overall asset returns (ROAA). Meanwhile, Liquidity Risk, Bank Size, and Loan Growth were found to be insignificant, suggesting that asset expansion and liquidity buffers alone do not guarantee profitability without operational efficiency. Collectively, the model explains a substantial portion of performance variation, though limitations remain regarding the short observation period and the exclusion of macroeconomic variables. Based on these findings, bank management is advised to prioritize operational efficiency through digital transformation and strict cost control, while investors should focus on efficiency ratios as key performance indicators.

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