Profitability Under Pressure: Operational Efficiency and Credit Risk in Indonesian Banking

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ABSTRACT
This study investigates the determinants of profitability in Indonesian private conventional banks, focusing on key financial indicators such as Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Operational Efficiency (OEOI), Non-Performing Loans (NPL), and bank size. Understanding these factors is crucial for regulators and bank managers aiming to optimise financial strategies in a rapidly evolving economic environment. The purpose of this study is to analyse the impact of these variables on profitability, measured explicitly by Return on Assets (ROA), and to offer insights into the factors that shape financial performance in Indonesian private banks. A panel regression analysis was employed, using data from 37 private banks from 2021-2023. The model examined how CAR, LDR, OEOI, NPL, and Total Assets influence profitability, with data collected from financial reports of listed banks. The results indicate that operational efficiency, as measured by the BOPO ratio, has a significant negative impact on profitability. At the same time, other factors such as CAR, LDR, NPL, and Total Assets did not show statistically significant effects. The discussion highlights that effective cost control and efficient operations are crucial for profitability, whereas other factors may be less influential. In conclusion, this study emphasises the importance of operational efficiency in enhancing bank profitability, while also suggesting areas for future research, such as including macroeconomic factors in profitability models.

Keywords: *Bank profitability, Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Operational Efficiency (OEOI), Non-Performing Loans (NPL), Total Assets, Return on Assets (ROA), Indonesian private banks, panel regression analysis, financial performance..*

1. INTRODUCTION

A bank's profitability is a fundamental indicator of its financial health, reflecting its ability to generate returns and ensure long-term sustainability. Given the increasing complexity of the global financial landscape, understanding the factors driving bank profitability is crucial for regulators and financial managers. Key determinants such as Capital Adequacy Ratio (CAR), liquidity management (LDR), operational efficiency (OEOI), and asset quality (NPL), alongside the bank's size, are critical in shaping a bank's profitability. By exploring these factors, this research addresses an important issue within the banking sector—how banks can optimize their financial strategies to remain profitable and resilient, particularly in a rapidly evolving economic environment. This understanding is valuable for bank managers seeking to improve performance and policymakers aiming to enhance the stability and competitiveness of the banking system (Buchory, 2020; Pasiouras & Tanna, 2020).

The Capital Adequacy Ratio (CAR) is pivotal in determining bank profitability by ensuring that a bank maintains sufficient capital to absorb potential losses. A higher CAR indicates that a bank is better equipped to withstand financial shocks and risks, thus reducing the likelihood of insolvency. This buffer enhances investor and depositor confidence, leading to more stable financial performance and higher profitability. CAR is often regulated by financial authorities to ensure that banks operate with adequate capital to protect both stakeholders and the broader economy (Löffler & Pineda, 2022). In addition to CAR, Liquidity Management (LDR) is crucial for profitability, as it reflects the bank's ability to meet short-term obligations without compromising long-term growth (Kuraeni & Isnaeni, 2022). A balanced LDR ensures that banks efficiently manage their loan portfolios while maintaining sufficient liquidity to support operations and mitigate the risk of a liquidity crisis, which can erode profitability.

Other significant variables include Operational Efficiency (OEOI), which measures how effectively a bank manages its operating costs relative to its income. A lower OEOI indicates a more efficient bank, where operational costs are minimized, leading to higher profitability. Conversely, Non-Performing Loans (NPL) represent the proportion of loans that are unlikely to be repaid, directly impacting a bank's profitability by increasing default risks and provisioning requirements. The Bank Size, measured by total assets, also affects profitability, as larger banks often benefit from economies of scale, operational efficiencies, and better access to capital (Bennaceur & Ghazouani, 2021). Larger banks are typically more diversified and capable of weathering financial crises better than smaller institutions, which can lead to improved profitability. Together, these variables provide a comprehensive picture of the factors that influence a bank's profitability, offering insights into how banks can optimize their operations for greater financial success (Godlewski et al., 2021).

Previous studies have consistently shown that capital adequacy, risk management, and bank size play significant roles in determining bank profitability. Capital Adequacy Ratio (CAR) has been widely recognized as a key factor in ensuring financial stability, with higher levels of capital generally leading to better profitability by providing a cushion against financial shocks. Similarly, liquidity measures such as the Loan-to-Deposit Ratio (LDR) have been found to influence profitability by balancing the bank's need to lend while maintaining adequate liquidity. Operational efficiency, often measured by ratios like Operating Expenses to Operating Income (OEOI), is another critical determinant, with more efficient banks tending to generate higher profits. Additionally, the impact of Non-Performing Loans (NPL) on profitability is well-documented, as higher NPL levels are associated with greater risk and reduced earnings. Finally, the size of the bank, typically measured by total assets, has been shown to provide advantages such as economies of scale and increased market power, contributing to better profitability. These findings underscore the complex interplay between financial and operational factors driving bank profitability (Berger & Bouwman, 2020).

While previous studies have examined the individual impact of variables such as capital adequacy, risk management, and bank size on profitability, there remains a lack of comprehensive research that simultaneously integrates these factors in the context of private banks, particularly in emerging markets like Indonesia. Many studies have focused on developed economies or have not explored the combined effects of these variables over time, thus leaving a gap in understanding how they interact to influence profitability in diverse banking environments. The purpose of this study is to address this gap by analyzing the interplay between capital adequacy, liquidity, operational efficiency, non-performing loans, and bank size in shaping the profitability of private banks listed on the Indonesian stock market (Budhathoki et al., 2020). This research aims to provide a more holistic view of the factors driving profitability, offering valuable insights for policymakers, regulators, and bank managers in emerging markets.

This research contributes to the existing literature by comprehensively analyzing how key financial variables—capital adequacy, risk management, and bank size—collectively impact private banks' profitability, particularly in Indonesia. By integrating these factors into a unified model, the study fills a significant gap in the literature, offering a deeper understanding of the interactions between capital, liquidity, operational efficiency, and asset quality in determining profitability. Additionally, the research focuses on private banks listed on the stock market, providing insights into the performance dynamics of these banks, which are subject to rigorous financial reporting standards and regulatory oversight (Bennaceur & Ghazouani, 2021; Pasiouras & Tanna, 2021). The findings contribute to the broader understanding of profitability determinants in emerging markets and offer practical implications for bank managers, policymakers, and financial regulators aiming to enhance the stability and profitability of the banking sector.

The Introduction provides an overview of the study, outlining the importance of bank profitability, the research problem, and the study's objectives. The Literature Review discusses existing research on the key financial variables that affect bank profitability, such as capital adequacy, risk management, and bank size. It highlights previous studies that examine these factors and their impact on profitability, as well as the methodologies commonly used in this area of research, such as panel regression analysis (Godlewski et al., 2021). The Research Methods section details the research design, including panel regression analysis and purposive sampling, focusing on private banks listed on the Indonesian stock market. In the Results and Discussions section, the findings from the regression analysis are presented and analyzed, with a discussion on how the key financial variables, capital adequacy, risk management, and bank size, affect profitability. The Conclusion summarizes the key findings, highlights the contributions to the field, and offers recommendations for future research and practical applications (Buchory, 2020). Finally, the References section lists all sources cited throughout the paper, providing the necessary academic foundation for the research.

2. LITERATURE REVIEW

2.1. Capital Adequacy

The Capital Adequacy Ratio (CAR) has long been considered a cornerstone of financial stability in banking, as it ensures that a bank has enough capital to absorb losses and continue operating during times of financial stress. Numerous studies have highlighted the critical role of CAR in maintaining profitability, particularly in managing financial risks. According to Admati et al. (2018), banks with higher capital ratios are more resilient during economic downturns, which translates into more stable and higher profitability. This resilience comes from the enhanced capacity to manage credit and market risks, which, if poorly managed, could significantly impact profitability. Moreover, studies by De Nicolò et al. (2021) show that banks with higher CAR can access cheaper funding, as they are perceived as less risky by investors, further contributing to profitability.

Recent research supports the view that CAR not only ensures financial stability but also enhances profitability by reducing risk exposure and promoting investor confidence. For instance, a study by Löffler and Pineda (2022) found a strong positive relationship between CAR and profitability, particularly in emerging markets like Indonesia, where regulatory standards have been tightening. This finding is in line with the work of Berger and Bouwman (2009), who argue that higher capital levels improve the bank's ability to absorb shocks and thus foster long-term profitability. In the context of Indonesian banks, where the CAR has become a critical regulatory measure, the link between adequate capital reserves and higher profitability is even more pronounced (Suryanto, 2015). Based on these insights, the hypothesis for this research posits that banks with higher CAR are likely to exhibit better profitability, given the enhanced risk management and stability afforded by sufficient capital reserves

H1. CAR has a positive and significant effect on ROA

2.2. Risk Management

The Loan-to-Deposit Ratio (LDR) has long been recognized as a critical determinant of bank profitability due to its direct impact on liquidity management. According to Rahmawati and Lestari (2021), a well-balanced LDR ensures that banks maintain sufficient liquidity to meet short-term obligations while still efficiently deploying funds into loans that generate income. Banks with an optimal LDR are able to balance risk and return effectively, avoiding both liquidity shortages and over-exposure to credit risk. Recent studies, such as those by Sari and Herwanto (2022), highlight that a high LDR, when managed properly, can enhance profitability by enabling banks to extend more loans without compromising their liquidity positions, thereby boosting interest income. However, excessively high LDRs can lead to liquidity problems, which may ultimately harm profitability by triggering costly borrowing to meet obligations.

Operational Efficiency (OEOI) is another crucial factor influencing profitability. OEOI reflects how effectively a bank controls its operating expenses relative to its income. A lower OEOI suggests that a bank is efficiently managing its operational costs, which is critical for maximizing profitability. According to research by Puspitasari and Susanto (2021), operational efficiency is positively correlated with profitability, as banks that can reduce their operating costs while maintaining or increasing their income are more likely to generate higher returns. This finding is supported by Wijayanti and Purnama (2022), who argue that banks with higher operational efficiency ratios tend to be more competitive, yielding better financial performance through cost reduction strategies such as digitization and streamlined processes. Efficiency, therefore, remains a key strategic focus for banks aiming to enhance their profitability in an increasingly competitive market.

The Non-Performing Loans (NPL) ratio directly affects bank profitability by increasing the risk of loan defaults and the need for provisioning. Banks with higher NPL ratios face the challenge of setting aside more funds to cover potential losses, which reduces their ability to generate profits. Research by Putri and Agustin (2023) demonstrates that a higher NPL ratio negatively impacts profitability, as it directly erodes the bank’s capital base and increases operational costs related to risk management. Similarly, Darmawan and Prasetyo (2022) found that banks with a high level of non-performing loans experience decreased profitability due to higher provisioning costs, which limits the amount of capital available for income-generating activities. This relationship underscores the importance of effective credit risk management in safeguarding bank profitability, particularly in times of economic uncertainty.

H2. LDR positively affects on ROA

H3. OEOI has a significant positive impact on ROA

H4. NPL negatively affect on ROA

2.3. Bank Size

Total assets have been consistently identified as a significant factor influencing bank profitability. Larger banks often benefit from economies of scale, enabling them to reduce per-unit costs and enhance profitability (Berger, 2020). The size of a bank, typically measured by its total assets, not only provides operational efficiencies but also grants better access to capital markets, fostering financial stability and growth (Godlewski et al., 2021). Studies have shown that larger institutions can diversify their portfolios more effectively, reduce risk exposure, and leverage their market power to achieve higher profitability (Bennaceur & Ghazouani, 2021). Additionally, larger banks have the capacity to absorb market shocks better, making them more resilient during economic downturns, which is reflected in their enhanced profit margins (Pasiouras & Tanna, 2021). These findings highlight the importance of total assets as a key driver of profitability, suggesting that bank size, as indicated by total assets, plays a critical role in shaping financial performance.

H5. Total Asset positively affects on ROA

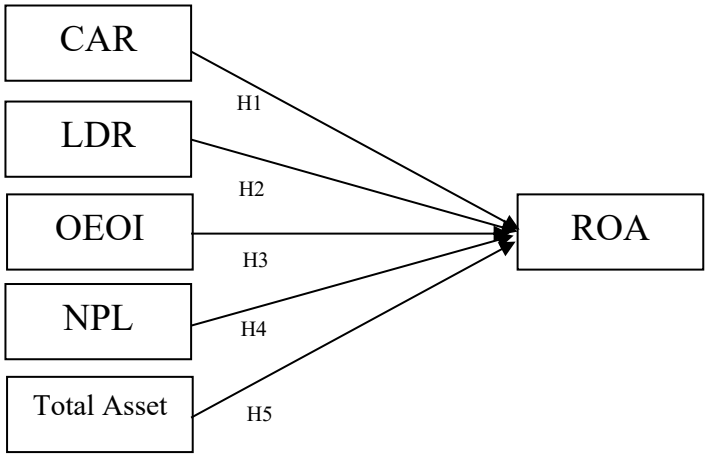

Figure 1. Research Model

2. RESEARCH METHODS

The study applies a panel data regression approach to examine the determinants of profitability in Indonesian conventional banks from 2021 to 2023. Profitability is measured by Return on Assets (ROA), a widely recognized metric that reflects a bank's efficiency in utilizing its assets to generate net income. The independent variables considered in this analysis include the Loan-to-Deposit Ratio (LDR), Operating Expenses to Operating Income Ratio (OEOI), Non-Performing Loan Ratio (NPL), Capital Adequacy Ratio (CAR), and Bank Size, represented by the logarithm of Total Assets (logasset). Due to the unbalanced nature of the panel, where some banks lacked complete data across all years, the dataset consists of 110 observations from 39 banks.

Diagnostic tests revealed significant skewness in the OEOI and Total Assets variables. A log transformation was applied to Total Assets to address potential distortions, ensuring consistent scale comparability across variables. After cleaning the data, including removing an observation with an invalid negative NPL value, regression analyses were conducted using both Fixed Effects (FE) and Random Effects (RE) models. The Hausman specification test informed the choice between these models, which adheres to robust econometric standards in panel data analysis.

The Hausman test showed no significant difference between the FE and RE estimates, as the coefficients were identical. As a result, the Random Effects model was selected for the final interpretation. This model is appropriate for the study, assuming that bank differences are random and uncorrelated with the independent variables. By leveraging both within- and between-bank variability, the RE model enhances the generalizability of the findings, making them applicable to the broader population of private banks in Indonesia.

$ROA = \beta_0 + \beta_1 CAR + \beta_2 LDR + \beta_3 OEOI + \beta_4 NPL + \beta_5 Total\ Asset_{it} + \mu_i + €_{it}$

β_0 = intercept

$_i$ = bank (1 to 37)

$_t$ = time (2021 to 2023)

μ_i = unobserved bank-specific

ϵ_{it}= konstanta

3. RESULTS AND DISCUSSION

3.1 Results

Table 1. Regression Coefficients and Statistical Significance of Independent Variables on ROA

Hypothesis	Coefficient (B)	Std. Error	z-value	p-value	95% Confidence Interval
LDR on ROA	0.00021	0.00039	0.53	0.593	[-0.00055, 0.00096]
BOPO on ROA	-0.02163	0.00418	-5.18	0.000	[-0.02982, -0.01344]
NPL on ROA	-0.10392	0.06139	-1.69	0.091	[-0.22425, 0.01641]
CAR on ROA	0.00043	0.00185	0.23	0.816	[-0.00319, 0.00405]
Total Asset on ROA	-0.00014	0.00065	-0.21	0.834	[-0.00140, 0.00113]
Constant	0.02943	0.01436	2.05	0.040	[0.00129, 0.05757]

The variable "CAR on ROA" in the regression model shows a coefficient of 0.00043, with a standard error of 0.00185. The z-value is 0.23, and the p-value is 0.816. The coefficient of 0.00043 indicates a very small positive relationship between the Capital Adequacy Ratio (CAR) and Return on Assets (ROA), suggesting that as CAR increases, ROA might slightly increase as well. However, the p-value of 0.816 is much higher than the standard significance threshold of 0.05, which indicates that this relationship is not statistically significant. The 95% confidence interval for the coefficient is [-0.00319, 0.00405], which includes zero. This further reinforces the idea that there is no meaningful or significant relationship between CAR and ROA in this model. Given the lack of statistical significance, the impact of CAR on ROA is likely negligible, and any observed relationship might be due to chance. Therefore, the result suggests that CAR does not have a statistically significant effect on ROA in this analysis.

Loan-to-Deposit Ratio (LDR), Capital Adequacy Ratio (CAR), and the logarithm of Total Assets (logasset) were not statistically significant predictors of ROA, as their p-values exceeded conventional significance thresholds. This indicates that, within the sample period, these variables did not have a clear and direct relationship with profitability. It is possible that other factors, such as market conditions or strategic choices made by the banks, played a more substantial role in influencing profitability. The constant term, however, was positive and statistically significant, with a coefficient of 0.02943, suggesting that there is a baseline level of profitability across the banks studied, independent of the variables included in the model. This implies that, despite the lack of significant relationships for some variables, banks still maintain a certain level of profitability by default, which may be influenced by other unmeasured factors or general market conditions.

Among the independent variables, the Operating Expenses to Operating Income Ratio (OEOI) showed a highly significant negative impact on ROA, with a coefficient of -0.0216 and a p-value less than 0.01. This suggests that higher operational inefficiency, reflected by a higher OEOI ratio, significantly erodes bank profitability. In other words, banks that incur higher operational expenses relative to their income are less efficient at converting their assets into net income, which reduces their overall profitability. This finding aligns with the theory that banks with lower operational costs relative to their income are more likely to achieve higher profitability, emphasizing the importance of cost control and operational efficiency.

The Non-Performing Loan (NPL) variable also had a negative coefficient (-0.1039), indicating that an increase in NPLs is associated with a decrease in profitability. The effect of NPL on ROA was marginally significant at the 10% level, with a p-value of 0.091. This suggests a potential detrimental impact of poor credit quality on profitability, but the strength of this evidence is weaker compared to the BOPO variable. High levels of NPLs tie up capital in non-performing assets, requiring banks to set aside higher provisions for loan losses, which limits the resources available for profitable activities. Although the effect was not as statistically strong, it still underscores the importance of effective credit risk management for maintaining profitability.

The variable "Total Asset on ROA" in the regression model shows a coefficient of -0.00014, with a standard error of 0.00065. The z-value is -0.21, and the p-value is 0.834. The negative coefficient of -0.00014 suggests that, theoretically, as Total Assets increase, Return on Assets (ROA) might slightly decrease. However, the p-value of 0.834 is much higher than the commonly used threshold of 0.05, indicating that the relationship between Total Assets and ROA is not statistically significant. The 95% confidence interval for the coefficient is [-0.00140, 0.00113], which includes zero. This further suggests that the true relationship between Total Assets and ROA could be weak or even

nonexistent. In essence, the model does not provide strong evidence to suggest that Total Assets have a meaningful or significant impact on ROA. Therefore, this result suggests that changes in Total Assets do not significantly affect ROA in this context.

The Random Effects panel regression model demonstrated a good fit for the data, with an overall R-squared value of 28.44%. This indicates that the model explains about 28.44% of the variation in Return on Assets (ROA) across the sample of Indonesian banks. The Wald Chi-square statistic ($\chi^2 = 29.47$, $p = 0.0000$) further confirmed the statistical significance of the model, meaning that the independent variables included in the model collectively have a meaningful impact on the dependent variable, ROA. The significance of the Wald test suggests that the model provides a robust framework for understanding how various financial indicators influence bank profitability.

3.1.1. Impact CAR on ROA

The absence of a statistically significant relationship between the Capital Adequacy Ratio (CAR) and bank profitability is widely observed in empirical banking literature. CAR is primarily a regulatory safeguard, ensuring banks maintain adequate capital to absorb unexpected losses and stabilize the financial system, rather than directly enhancing profitability. Most banks operate within strict regulatory requirements, optimizing their capital structure to meet minimum CAR thresholds without overcapitalization. Once these thresholds are met, any additional increase in CAR does not lead to proportional gains in profit, as banks prioritize risk management over maximizing returns (Nasution, Silalahi, & Khairunnisa, 2022; Ihsani & Yudiantoro, 2022). Studies on Islamic banking further support this, showing that profitability is more responsive to macroeconomic factors like GDP growth and inflation rather than CAR itself (Nasution et al., 2022; Rafiqi & Annisa, 2023).

In contrast, internal banking variables such as the Net Interest Margin (NIM), Non-Performing Loans (NPL), and the Loan to Deposit Ratio (LDR) are often more significant determinants of profitability, while CAR plays a secondary role focused on risk mitigation. Regression models indicate that profitability is more strongly influenced by operational efficiency and asset quality (Ihsani & Yudiantoro, 2022). Additionally, the classical risk-return trade-off suggests that while higher CAR levels enhance solvency and reduce risk, they may also limit a bank's ability to leverage capital for higher-yielding investments, potentially leading to lower returns on assets (Nasution et al., 2022).

3.1.2. Impact LDR on ROA

The relationship between the Loan to Deposit Ratio (LDR) and bank profitability has been a subject of much debate in empirical studies, with findings often suggesting a weak or insignificant connection. While a higher LDR theoretically indicates better credit allocation and increased interest income, empirical evidence frequently shows that this does not consistently translate into improved profitability. This can be explained by banks' efforts to maintain an optimal LDR, balancing liquidity risk with revenue generation. By adhering to internal policies and regulatory requirements, banks avoid excessive lending and prioritize maintaining liquidity buffers. Consequently, small fluctuations in the LDR around this equilibrium level have minimal impact on profit outcomes, as shown in studies by Buchory (2020) and Menicucci & Paolucci (2016). Moreover, profitability in banking is influenced by various factors such as asset quality, credit risk, and operational efficiency, which often diminish the isolated effect of LDR on profitability.

Additionally, the regulatory environment and broader economic conditions play crucial roles in shaping the significance of LDR. In heavily regulated banking systems, conservative lending practices dominate, reducing the potential for increased profitability through higher LDRs. Banks operating under stringent liquidity and solvency requirements often prioritize financial resilience over aggressive lending strategies. This structural conservatism explains why the LDR, as a standalone indicator, fails to capture significant variations in profitability. Furthermore, macroeconomic conditions such as economic uncertainty or tight monetary policies can limit the positive effects of higher LDRs, as they may lead to increased loan defaults or decreased credit demand. In conclusion, while LDR remains an important indicator of liquidity and intermediation efficiency, its impact on profitability is often overshadowed by factors like asset quality, cost control, and risk exposure, which are more directly linked to bank performance (Buchory, 2020; Danmulki et al., 2022; Andesfa & Masdupi, 2019).

3.1.3. Impact OEOI on ROA

The significant influence of operational efficiency on bank profitability is well-documented in empirical banking literature. Operational efficiency, often assessed through the operating expense to operating income ratio (BOPO), reflects a bank's ability to control costs in relation to its revenues. A lower BOPO ratio signifies effective cost management, which, in turn, enhances a bank's ability to generate higher net income and improve profitability. Studies by Masood and Ashraf (2012) and Ayalew (2021) emphasize that banks with better operational efficiency consistently

outperform their peers in terms of profitability metrics like Return on Equity (ROE) and Return on Assets (ROA). These findings underscore the fact that profitability is not just about maximizing revenue but also about effectively managing operating costs. Efficient cost control serves as a strategic advantage, allowing banks to maintain profitability even in challenging economic conditions.

Further empirical evidence highlights the importance of operational efficiency in sustaining long-term profitability. Christaria and Kurnia (2016) suggest that inefficiencies in managing operating costs can significantly erode profit margins, thus necessitating the strengthening of operational frameworks. Similarly, Kuraeni and Isnaeni (2022) confirm that in Islamic banking institutions, a lower BOPO ratio is closely linked to improved profitability, demonstrating the universal relevance of cost control across banking sectors. These studies emphasize that operational efficiency is not just a financial performance metric but a reflection of a bank's overall organizational health. By maintaining a lean cost structure, banks can reallocate resources towards innovation, technology, and customer service improvements, further contributing to their financial success. In conclusion, operational efficiency is a critical determinant of bank profitability, and banks that prioritize cost management and operational discipline are more likely to achieve superior financial outcomes.

3.1.4. Impact NPL on ROA

The absence of a statistically significant relationship between non-performing loans (NPLs) and bank profitability challenges the common expectation that bad loans directly erode income. However, this phenomenon can be explained by the effective risk management practices employed by banks. When originating loans, banks often incorporate risk premiums into their lending rates to account for potential defaults, thus enabling them to absorb the financial impact of NPLs in advance. This forward-looking pricing mechanism helps mitigate the negative effects of defaults, allowing banks to maintain profitability even when NPL ratios rise (Isenberg, Sazu, & Jahan, 2022). Additionally, banks typically employ proactive provisioning strategies, setting aside allowances for expected loan losses, which act as financial buffers. These provisions reduce the immediate impact of NPLs on profitability, ensuring that banks maintain long-term financial resilience (Mennawi, 2020).

Moreover, the relationship between NPLs and profitability is influenced by the multifactorial nature of bank profitability. Factors such as operational efficiency, funding structure, and macroeconomic conditions play a significant role in determining a bank’s overall financial performance. In some cases, credit restructuring and recovery initiatives, such as penalty fees or rescheduling charges, can generate additional income, offsetting the losses from defaulted loans (Christaria & Kurnia, 2016). Therefore, while NPLs remain important indicators of asset quality and risk, their direct influence on profitability is often mitigated by effective risk management strategies, diversified income streams, and strong capital buffers. In well-managed institutions operating within stable regulatory environments, the effect of NPLs on profitability may be neutral or even marginally positive, rather than negative (Nasution, Silalahi, & Khairunnisa, 2022; Ayalew, 2021).

3.1.5. Impact Total Asset on ROA

The finding that total assets, often used as a proxy for bank size, does not significantly impact profitability may initially seem counterintuitive, particularly given the widely held belief that larger banks benefit from economies of scale. While it is true that growing assets can lead to more efficient resource allocation and lower per-unit transaction costs, the relationship between size and profitability is not always linear or universally positive. As banks expand beyond a certain threshold, they can experience diseconomies of scale, where operational complexity increases disproportionately, leading to higher administrative overhead and inefficiencies in decision-making. This phenomenon, as highlighted by Budhathoki et al. (2020), means that the expected benefits of growth may be offset by internal frictions, diminishing the positive impact of asset size on profitability.

Moreover, total assets alone do not necessarily reflect the efficiency with which those assets are utilised. A bank with a large asset base may still struggle with low productivity or poor asset quality, which can erode profitability. Empirical studies, such as those by Dao and Nguyen (2020), show that while larger banks may have a higher asset base, their profitability is not guaranteed and can even be lower in emerging markets due to inefficiencies in their operations. Additionally, other factors such as cost efficiency, asset quality, and risk management practices tend to have a stronger influence on profitability than sheer asset volume. This suggests that smaller, more agile banks may outperform larger ones by focusing on efficiency, niche markets, and innovation. In regulated and saturated markets, the advantages of size can be diminished by increased regulatory burdens and complex governance structures, making strategic agility and managerial quality more critical in determining financial performance (Budhathoki et al., 2020). Therefore, the lack

of a significant relationship between total assets and profitability reflects the complex interplay of internal and external factors that go beyond asset size alone.

3.2 DISCUSSION

This study investigates the determinants of profitability in Indonesian private conventional banks during the 2021–2023 period, focusing on five key variables: Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Operating Efficiency (OEOI/BOPO), Non-Performing Loans (NPLs), and Total Assets. The empirical results indicate that among these, only operating efficiency exhibits a significant effect on profitability, measured by Return on Assets (ROA). The other four variables—CAR, LDR, NPLs, and Total Assets—do not show statistically significant relationships with profitability. These findings provide nuanced insights into the performance dynamics of private banking institutions, which may differ considerably from those of state-owned banks.

The absence of a significant effect of the Capital Adequacy Ratio (CAR) aligns with the notion that CAR primarily serves as a regulatory safeguard rather than a driver of financial performance. CAR ensures the bank's solvency and resilience against potential losses but does not inherently enhance profit margins. Nasution, Silalahi, and Khairunnisa (2022) and Ihsani and Yudiantoro (2022) both confirm that banks often operate close to the regulatory minimum CAR thresholds, and variations beyond this level have limited marginal effects on earnings. Moreover, since banks internalize risk through prudent capital planning, CAR becomes more relevant for risk containment than for profitability enhancement.

Similarly, the Loan to Deposit Ratio (LDR) is not found to have a significant impact on profitability. Although LDR reflects credit expansion and intermediation activity, its effect on earnings is likely muted when banks operate within optimal lending thresholds that balance liquidity and risk. As shown by Buchory (2020) and Menicucci and Paolucci (2016), banks may not experience significant profit shifts from minor changes in LDR due to regulatory limitations and risk-averse lending practices. Furthermore, in a private banking context where profit orientation is aggressive but still governed by prudential regulations, LDR may not be a sole indicator of profitability without considering the quality of credit and borrower performance.

In contrast, operating efficiency—as measured by the BOPO ratio—shows a robust and statistically significant relationship with profitability. This confirms that cost management remains a central determinant of financial performance in private banks. Studies by Masood and Ashraf (2012), Ayalew (2021), and Kuraeni and Isnaeni (2022) consistently highlight that lower operating expenses relative to income directly translate to higher profits. In private banks, which face intense competition and tighter profit margins compared to state-owned counterparts, operational discipline becomes critical. Efficient operations not only enhance margins but also signal strong managerial performance and strategic cost control.

Interestingly, the study also finds that Non-Performing Loans (NPLs) do not significantly affect profitability. This may be attributed to effective risk pricing and provisioning strategies adopted by banks to absorb expected credit losses. Banks often embed risk premiums in lending rates and allocate provisions to mitigate the impact of defaults. Isenberg et al. (2022) and Mennawi (2020) argue that well-capitalized banks with robust credit monitoring systems can shield their income statements from volatility arising from deteriorating asset quality. This suggests that in private banks, which must be agile in maintaining portfolio health, the impact of NPLs on profits is less direct and more contingent on how risk is managed rather than the NPL level itself.

Finally, total assets—used as a proxy for bank size—also show no significant relationship with profitability. This finding challenges the conventional assumption that larger banks inherently perform better due to scale advantages. In reality, as Budhathoki et al. (2020) and Dao and Nguyen (2020) suggest, asset growth may bring about bureaucratic inefficiencies, higher overhead costs, and managerial complexity that offset the potential benefits of scale. Moreover, unlike state-owned banks that may benefit from government-backed capital injections or policy-driven market access, private conventional banks must rely on lean operations and strategic agility, making size alone an insufficient predictor of profitability.

In conclusion, the results highlight that operational efficiency stands out as the primary profitability driver in Indonesian private conventional banks, whereas size, credit volume, capital adequacy, and credit risk levels alone do not guarantee higher returns. This diverges from assumptions often associated with state-owned banks, where scale and government intervention may play more prominent roles. Therefore, private banks must focus more intensely on internal performance levers such as cost efficiency, asset productivity, and risk-adjusted pricing strategies to sustain profitability in a competitive market landscape.

This study provides valuable insights into the determinants of profitability in Indonesian private conventional banks, yet it is subject to several limitations that should be acknowledged. One key limitation is the focus on a relatively small sample of 37 private conventional banks over a short time period (2021–2023). While this timeframe offers a snapshot of post-pandemic dynamics, it may not capture long-term structural trends or cyclical financial behaviors, especially during economic expansions or contractions. Furthermore, the exclusion of state-owned banks restricts the generalizability of the findings, as these institutions often operate under different mandates, governance structures, and risk tolerances compared to their private counterparts. As a result, the insights derived from this study may not fully apply to the broader banking sector in Indonesia, which includes state-owned institutions with distinct operational characteristics.

Another limitation of this study lies in the set of financial ratios used as the primary explanatory variables—Capital Adequacy Ratio (CAR), Loan to Deposit Ratio (LDR), Operating Expense to Operating Income (OEOI) ratio, Non-Performing Loans (NPL), and Total Assets. While these indicators are widely accepted in banking literature, they do not capture all potential factors influencing profitability. Variables such as interest rate volatility, the role of digital transformation, customer base diversification, and macroeconomic shocks—such as fluctuations in exchange rates or changes in monetary policy—were not incorporated into the model. The omission of these factors may result in omitted variable bias, which could either underestimate or overestimate the effects of the included variables, limiting the robustness and explanatory power of the study's findings.

To address these limitations and enhance future research, several directions are recommended. First, conducting comparative studies that include both private and state-owned banks could provide deeper insights into how ownership structures affect profitability. This would help clarify whether the insignificance of variables like CAR or Total Assets holds across different banking models. Second, extending the study period to cover both pre- and post-pandemic phases would allow for a more comprehensive understanding of how profitability determinants evolve under varying macroeconomic conditions. Incorporating macro-level indicators such as GDP growth, inflation, and policy interest rates could also improve the explanatory power of future models. Lastly, a mixed-method approach that combines quantitative data with qualitative insights, such as interviews or case studies, could uncover additional factors like managerial strategies, organizational culture, and responses to digital disruption, providing a more holistic view of the factors driving profitability in Indonesia's banking sector.

4. CONCLUSSION

Overall, the study confirms that operational efficiency, as captured by BOPO, is the primary driver of bank profitability in Indonesia during the observed period. Credit quality, as indicated by NPL, also plays a role but with a weaker statistical impact. Other factors such as liquidity management (LDR), capital adequacy (CAR), and bank size (logasset) did not show significant direct effects on profitability. These findings highlight the strategic importance for banks to prioritise internal cost control and maintain prudent credit risk management to enhance performance. Future studies could extend the observation period or incorporate external macroeconomic controls to further refine the understanding of profitability determinants in the Indonesian banking sector.

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