E-ISSN: 2775-2267
Email: ristansi@asia.ac.id
https://jurnal.stie.asia.ac.id/index.php/ristansi

RISK-DRIVEN PROFITABILITY IN INDONESIAN LISTED BANKS: CAPITAL, LIQUIDITY, AND CREDIT ROLE

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DOI: 10.32815/ristansi.v7i1.2977

Article Information

Date Received	07 February, 2026
Date Revised	10 April, 2026
Date Accepted	27 May, 2026

Keywords:
Bank capital, Bank Size, Credit Risk Efficiency, Liquidity Risk, Loan Growth

Abstract:
Objective of this study is to investigate the key factors influencing bank profitability. The research utilizes a group of banks listed on the Indonesia Stock Exchange within a defined observation timeframe. employing panel data analysis methods for data processing. According to Ma'aji et al. (2025) The results indicate that various internal bank factors have differing effects on profitability. This study underscores the significance of effective financial management in making sure of the stability and profitability of banking institutions. It aims to evaluate the influence of key determinants, including bank capital, credit risk, liquidity risk, bank size, loan growth, and operational efficiency, on bank profitability. The analysis is based on a sample of banks listed on the Indonesia Stock Exchange over the 2020–2024 period, utilizing a panel data regression model. The empirical findings demonstrate that bank capital exerts a positive and statistically significant effect on profitability, indicating that a stronger capital base enhances a bank's capacity to generate returns. Conversely, efficiency is observed to have a significant negative impact, implying that higher levels of inefficiency adversely affect financial performance. Meanwhile, credit risk, liquidity risk, bank size, and loan growth do not exhibit a statistically significant relationship with bank profitability.

INTRODUCTION

Financial markets comprise various participants are essential in ensuring efficient functioning and regulation within financial activities. These markets also serve as a key source of funding for both economic entities and individuals. In developing countries, banks remain the dominant institutions within the financial system, acting as the primary intermediaries in financial market operations. As profit-oriented entities, banks

are required to generate sufficient income to cover operational costs and sustain profitability.

According to OJK (2025), the profitability of the Indonesian banking sector remains stable despite uncertain economic conditions, with continued growth in recent periods. Credit distribution also shows a positive trend, reflecting sustained banking activity and supporting investor confidence in banking stocks (Cahyaningtyas & Rahayu, 2021). This condition indicates that the banking sector continues to attract investors due to its relatively stable performance and contribution to economic growth.

Bank capital plays a crucial role in supporting banking operations and absorbing potential losses, particularly under conditions of economic uncertainty. Strong capital positions enhance a bank's resilience and financial stability (Fitriani & Maharani, 2024). According to Ma'aji et al. (2025) has a Credit risk is a key concern in banking activities, as poor loan quality can negatively affect financial performance and increase provisions for potential losses. Similarly, liquidity risk demonstrates the bank's capability to meet short-term duties, where poor liquidity management may weaken financial stability and reduce stakeholder confidence (Ekanayake & Wanniarachchige, 2023).

Bank size may also influence profitability, as larger banks benefit from diversification opportunities but may face higher operational costs and management complexity. Loan growth is generally associated with increased interest income, although excessive expansion may lead to higher risk exposure and potential deterioration in asset quality. Meanwhile, The level of operational efficiency significantly affects how profitable a company can be, as effective cost management allows banks to optimize resources and improve financial performance (Cangombe E., Almeida, L., & Tavares, F., 2025).

LITERATURE REVIEW

Research Gap

Despite extensive research on the key factors of bank profitability, the findings remain inconsistent. While certain studies show a positive association between bank capital and profitability, others find insignificant or mixed results. Similar inconsistencies are also found in the role of credit risk and liquidity risk, where some studies identify a negative relationship, whereas others report no significant effect.

In addition, most previous studies are based on earlier observation periods and different economic conditions, which may not fully reflect the current situation of the banking sector in Indonesia. Furthermore, studies that simultaneously incorporate bank capital, credit risk, liquidity risk, bank size, loan growth, and efficiency using a panel data approach on banks included in the Indonesia Stock Exchange remain limited. Therefore, this research is necessary to refresh empirical findings and offer a more comprehensive insight into the determinants of bank profitability in under recent economic conditions.

Research Novelty

The novelty of this research comes from its use of up-to-date data drawn from banks included on the Indonesia Stock Exchange over the most recent period. and integrating several internal bank factors, namely capital, credit risk, liquidity risk, bank size, loan growth, and efficiency within a single analytical model. In addition, this study employs a panel data approach, which enables a more comprehensive analysis of the relationships among variables in determining bank profitability in Indonesia. According to OJK (2025) This study is important for the essential role of banks as financial intermediaries in driving economic expansion, particularly within developing countries such as Indonesia. Considering that profitability represents a fundamental indicator of financial performance and stability, examining its factors is essential to preserve the robustness of the banking sector In addition, recent economic uncertainties and dynamic financial conditions have increased the need for banks to manage their internal factors effectively, including capital adequacy, risk exposure, asset growth, and operational efficiency (Fitriani & Maharani, 2024). Variations in empirical findings regarding these determinants further highlight the need for updated and comprehensive evidence based on recent data. Therefore, this study is seeks to offer a clearer insight into how internal bank factors affect profitability., which is important for improving managerial decision-making, supporting investor trust, and help maintain the banking industry in Indonesia (Cahyaningtyas & Rahayu, 2021).

Grand Theory

This study is underpinned by a range of core banking and financial theories that collectively provide an explanation of how bank performance is shaped by capital strength, risk exposure, operational efficiency, firm size, and lending activities. The

Financial Intermediation Theory serves as the primary foundation, explaining that banks generate income by channeling funds from depositors to borrowers. This implies that variables related to lending activities, including loan growth, are essential in determining bank performance. Higher loan growth increases interest income and earning assets, thereby supporting profitability. However, this mechanism is closely linked with risk factors, particularly credit risk.

The Risk-Return Trade-Off Theory further explains that while banks aim to maximize returns through lending, higher exposure to risks including credit risk and liquidity risk—can negatively affect achievements if not properly managed. Credit risk, arising from potential loan defaults, directly reduces profitability through non-performing loans. Similarly, liquidity risk reflects the trade-off between holding liquid assets and maximizing returns, where both excessive and insufficient liquidity may reduce efficiency and profitability. These relationships form the basis for the expected negative effects of credit risk and liquidity risk on bank performance.

Additionally, the Capital Buffer Theory emphasizes bank capital acts as a protective cushion against financial shocks. Greater capital levels strengthens a bank's ability to strength in facing risks, improves its ability to manage risks, and enhances market confidence. Consequently, well-capitalized banks are more capable of maintaining stable operations and generating sustainable profits. This theoretical perspective supports the expected positive relationship between bank capital and bank performance.

The Efficiency Structure Theory explains that profitability is largely determined by operational efficiency. Banks that can efficiently regulate costs and utilize resources effectively tend to achieve higher financial performance. However, inefficiency, often reflected in a high cost-to-income ratio, can reduce profitability. Therefore, efficiency is expected to significantly influence bank performance, depending on how well costs are managed relative to income.

Lastly, the Economies of Scale Theory explains the role of bank size in influencing performance. bigger banks may obtain benefits such as cost efficiency, diversification, and enhanced market power, thereby contributing to higher profitability. Meanwhile, beyond a certain point, increased size could also give rise to lead to operational complexity and inefficiencies, as described by the diseconomies of scale concept. This explains why the effect of bank size on performance may vary across contexts.

Overall, these theories provide a comprehensive framework linking capital strength, risk management, efficiency, size, and lending activities to bank performance. Based on these theoretical foundations, this study formulates hypotheses regarding the positive effect of bank capital, the negative effect of credit risk and liquidity risk, and the significant influence of bank size, loan growth, and efficiency on bank performance.

Bank Performance

Bank Performance is measured by Profitability. Profitability is the ability for banks to generate profit for its shareholders, measured by ROAA. (Ma'aji et al., 2025). According to the Indonesian Law of 1998 about banks, banks are institutions that collect public funds and distribute them in the form of credit or other services, must maintain profitability to provide returns for investors and meet obligations to creditors. Banking is an entity that acts as a financial intermediary, collecting money and using its services to benefit the society(Mulyaningtyas & Candra, 2022). As the main indicator in assessing bank performance, profitability reflects the efficiency and effectiveness of the bank in utilising resources to achieve high profits (Hacini et al., 2021). ROAA represents a financial indicator used to assess how effectively a bank leverages its assets to produce earnings. It serves as a tool for analysing the measurement of firm or business unit performance and for financial performance comparison across firms (Keqa, 2021). Based on the literature, bank performance, as proxied by ROAA, represents the effectiveness of asset utilization in generating profits while fulfilling its intermediary role, making profitability a comprehensive indicator of financial efficiency, operational effectiveness, and overall banking stability

Bank Capital

Bank Capital is a collection of monetary capital gathered in a bank for use in payments and other transactions, namely bank funds (Ma'aji et al., 2025). Bank Capital is the initial step that occurs when restructuring the existing capital structure helps protect the banking sector from extensive pressures. In addition, sufficient capital enables the implementation of higher operational standards, facilitates business growth, and contributes to improved performance. Thus, capital plays a role in the recapitalisation process to meet the needs of each bank through the addition of minimum paid-in capital (Saleh & Abu Afifa, 2020). Bank Capital is calculated by total equity to total asset ratio. According to research by Ma'aji et al. (2025) found that Bank

Capital has a positive impact on bank profitability, which is due to banks with higher capitalisation showing an ability to increase business revenue and reduce costs, and a well-capitalised bank faces lower bankruptcy costs, leading to reduced funding costs and higher levels of profitability. Overall, bank capital plays a crucial role in enhancing profitability, as higher capitalisation not only strengthens financial stability and reduces bankruptcy risk but also improves banks' capacity to generate income and operate more efficiently.

Liquidity Risk

Liquidity risk merupakan risiko bahwa kondisi keuangan bank atau keselamatan secara keseluruhan terganggu oleh ketidakmampuan bank untuk memenuhi kewajibannya (Samarasinghe & Lakmal, 2025). Liquidity Risk is measured by liquid asset to total asset ratio, liquid asset is taken from easily liquidated cash such as cash, giro, placements in other banks, securities (Ma'aji et al., 2025). Fang et al. (2019) consistently indicate that a large funding gap, which reflects a high level of liquidity, is associated with declining bank profitability. This implies that while keeping sufficient liquidity is necessary to promote operational stability and meet short-term obligations, having too much liquidity might lead to inefficiency. According to Saleh & Abu Afifa (2020) found that In the bank's industry, large consumer withdrawals lead to huge liquidity risk. By impeding prospective clients and purchasers who ought to be assisted by the bank, this has a detrimental effect on banking performance. Consequently, the bank's advantages and utility both sharply decline. In summary, while maintaining adequate liquidity is essential for ensuring operational stability and meeting short-term obligations, excessive liquidity may lead to inefficiencies that ultimately reduce bank profitability

Credit Risk

Credit risk describes the risk of financial loss encountered by a bank due to events such as borrowers violating their debt repayment obligations (Tran & Phan, 2020). Credit Risk is measured by loan loss provisions to gross loansratio (Ma'aji et al., 2025). Almeida & Sousa (2025) also notes Credit risk adversely affects bank value and profitability, as the need to provision for potential loan losses constrains the bank's ability to generate profits, which can negatively impact the bank's profitability. Credit risk has a negative impact on bank profitability, as banks tend to extend more loans

than the deposits they receive from customers, which can weaken profit levels and asset positions. Elevated credit risk also leads to an increase in non-performing loans, thereby creating financial vulnerability for banks. Increased credit risk contributes to the growth of non-performing loans, resulting in financial fragility to the bank and its customers, so it is necessary to strengthen credit risk management (Jackson & Tamuke, 2022). According to Tran & Phan (2020) shows that there is a lack of management of Credit risk is embedded across the entire portfolio and within specific credit exposures or transactions, thereby reducing profitability. Thus, credit risk negatively affects bank profitability, as higher levels of non-performing loans and inadequate risk management increase financial vulnerability and limit the bank's capacity to produce sustainable returns.

Bank Size

Bank Size is a ratio that measures a bank which is measured by a natural logarithm of total assets (Tran & Phan, 2020). According to research by Ma'aji et al. (2025) Bank size has a negative impact on bank profitability, as larger banks tend to face higher operational costs, greater organisational complexity, and stricter regulatory oversight, which may reduce returns on assets., in contrast to research by Tran & Phan (2020) found that Bank Size has a positive effect on bank's profitability because large Banks will receive good support and more effective operational management, resulting in optimal banking service provision.Research by Mengstie et al. (2024) shows that Bank Size has a positive effect on Bank profitability measured by ROAA because larger banks can obtain capital at a lower cost and generate higher profits. This occurs because the size of the bank is strongly correlated with its capital adequacy level. According to research by Chand et al. (2024) Bank Size has a positive influence because a larger Bank size allows fixed costs to be spread over a wider range of assets, thereby reducing average costs, and Banks with larger sizes generally have stronger bargaining positions. In conclusion, the effect of bank size on profitability remains inconclusive, as larger banks may gain advantages from economies of scale and improved access to capital, yet may also face higher operational complexity and costs that potentially reduce profitability.

Loan Growth

Loan Growth is the rise of bank loans over a period of years (Wu et al., 2022). LG is measured by $loan_t$ reduced by $loan_{t-1}$, a positive LG shows a growth in credit distribution compared to the previous year, whereas a negative LG value indicates a decline in credit than the previous year (Ma'aji et al., 2025). Loan Growth becomes an indicator that shows the difference between the annual growth rate of a bank's total loans and the growth rate of the relevant aggregate loan amount, Loan Growth can drive the bank's profitability if the expansion is not followed by a decline in loan quality (Rossi et al., 2019). Therefore, loan growth can positively influence bank profitability when credit expansion is accompanied by effective risk management and maintained loan quality, ensuring sustainable income generation.

Efficiency

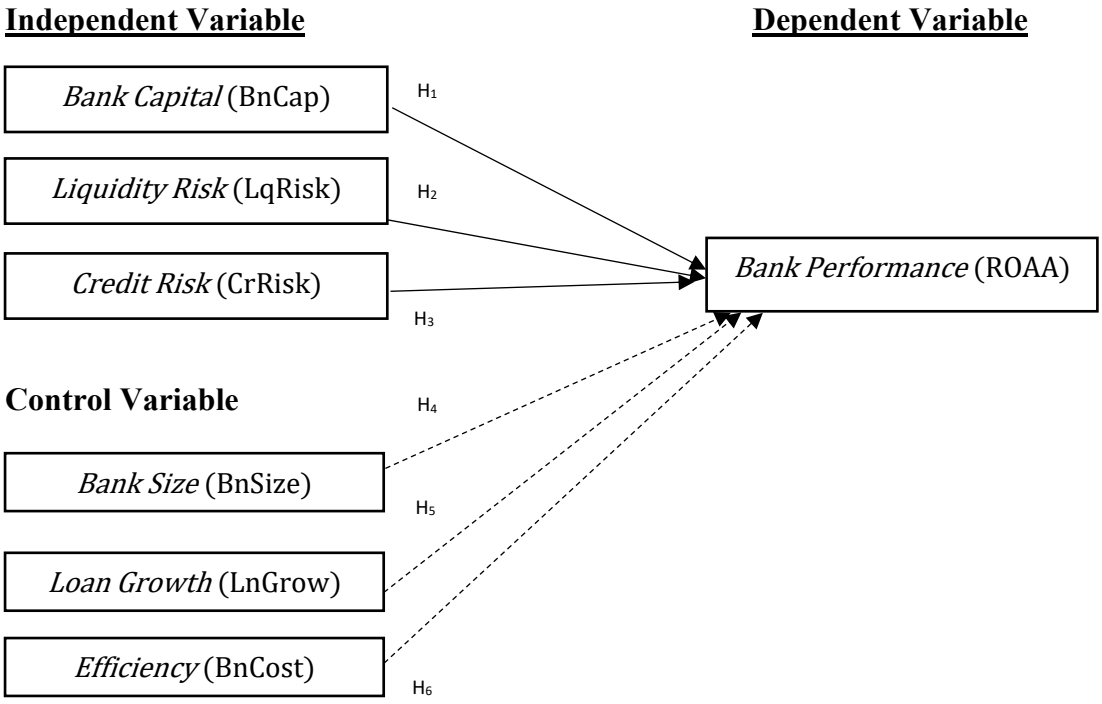
Efficiency is how well the bank can control its operational costs to generate optimal revenue. Efficiency is measured by cost-to-income ratio (Ma'aji et al., 2025). A bank's operational efficiency is gauged by the cost-to-income ratio, which evaluates how well it controls operating expenses. A lower ratio indicates stronger performance and greater profitability (Afriyie & Aidoo, 2022). Effective operational cost management (cost-to-income ratio) is important to maintain profitability in the banking sector (Al Zaidanin & Al Zaidanin, 2021). In essence, operational efficiency is a key determinant of bank profitability, where effective cost management, reflected by a lower cost-to-income ratio, enhances the bank's ability to maximise returns.

Conceptual Framework

According to research by Saleh & Abu Afifa (2020) bank capital positively affects bank profitability because increased capital can raise expected income by reducing costs associated with potential financial difficulties within the bank. According to research by Hacini et al. (2021) liquidity risk has a negative impact on profitability; banks with insufficient liquidity can reduce the bank's profitability. According to research by Jackson & Tamuke (2022) credit risk has a negative impact on bank's profitability due to the banking system's tendency to issue a greater proportion of loans relative to deposits collected. According to research by Ma'aji et al. (2025) bank size negatively impacts bank profitability due to its high operational costs. Nguyen & Le (2022) found that loan growth has a positive impact on Bank Profitability, implying that

loans contribute to higher bank income. According to Trang et al. (2021) efficiency has a positive impact on Bank Profitability due to the high level degree of efficiency which can increase profitability.

Figure 1
Conceptual Framework Diagram



Source: Data processed, 2026

Hypothesis Development

Bank Capital Effect on Bank Performance

According to the Capital Buffer Theory, bank capital acts as a financial buffer that enables banks to handle potential losses and preserve stability amid economic shocks. additionally, the Risk Absorption Theory explains that higher capital levels reduce the probability of financial distress and enhance market confidence. A well-capitalized bank is therefore more capable of sustaining operations and generating profits. Empirical evidence supports this argument Using ROAA, research by Saleh & Abu Afifa (2020) discovered that bank capital positively affects profitability. According to their findings, banks can better manage operational risks and withstand financial shocks when they have a higher capital position, which boosts profitability. Equally, Abbas et al. (2019), bank capital has a beneficial influence on profitability for commercial banks in Asia and the US who similarly used ROAA as a measure of profitability. In summary, bank capital

is expected to positively influence bank performance, as stronger capitalisation enhances financial resilience, improves risk management, and increases the bank's capacity to generate sustainable income.

H_1: Bank Capital effects Bank Performance

Liquidity Risk Effect Bank Performance

The association between liquidity risk and bank performance is explained by the Liquidity Preference Theory, which highlights the balance between between liquidity and profitability. Holding excessive liquidity leads to idle funds that reduce income generation, while insufficient liquidity increases the risk of financial distress. This trade-off suggests that liquidity risk can negatively affect bank performance when not managed properly. Research by Saleh & Abu Afifa (2020) consistently demonstrates that a higher liquidity level, which is indicated by a larger funding gap, tends to be associated with a decline in bank profitability. As stated by Hacini et al. (2021) Liquidity risk without sufficient liquidity can reduce their profitability. According to Ma'aji et al. (2025) liquidity risk generally decreases profitability because banks facing significant liquidity will miss high investment opportunities, which can lower profitability. Overall, liquidity risk tends to negatively affect bank performance, as excessive or insufficient liquidity can lead to inefficiencies and missed investment opportunities, ultimately reducing profitability.

H_2: Liquidity Risk Effects Bank Performance

Credit Risk Effect on Bank Performance

The Risk-Return Trade-Off Theory explains that greater risk is tied to the potential for increased returns, but excessive risk particularly credit risk can lead to financial losses. In banking, credit risk arises from borrowers not meeting their required payments, resulting in non-performing loans. According to research by Tran & Phan (2020) emphasise that banks are required to manage credit risk not only at the portfolio level but also at the level of individual loans or transactions. They further highlight that credit risk does not operate independently, but is closely interconnected with other types of risk. According to Almeida & Sousa (2025) that credit risk reduces bank profitability and value given banks have to spend money to cover loan losses, which in turn constrains their capacity to generate profits. According to Jackson & Tamuke (2022) Credit Risk negatively affects ROAA because the entire banking system

generally extends a greater volume of loans than the deposits it collects from customers. Thus, credit risk is expected to have a negative impact on bank performance, as higher exposure to loan defaults and inadequate risk management reduces profitability and weakens financial stability.

H_3: Credit Risk Effects Bank Performance

Bank Size Effect on Bank Performance

The contribution of bank size on performance is explained by the Economies of Scale Theory, which suggests that larger firms can reduce average costs and improve efficiency. Large banks benefit from stronger market power, lower funding costs, and better diversification opportunities. However, the Diseconomies of Scale Theory argues that excessively large institutions may face higher operational complexity and increased costs. Empirical findings are mixed: According to research by Ma'aji et al. (2025) Bank Size negatively affects Bank Profitability because face higher operational costs and stricter regulatory oversight, which in turn reduce returns on assets. This contradicts previous research by Chand et al. (2024) Large banks also have stronger bargaining power to obtain cheap funding, reduce operational costs, and influence interest rates due to their greater market power. All of this strengthens their ability to generate profits. In conclusion, although findings are mixed, bank size is often expected to influence performance since bigger banks tend to gain advantages from economies of scale and stronger market presence despite facing higher operational complexity.

H_4: Bank Size Effects Bank Performance

Loan Growth Effect on Bank Performance

The Financial Intermediation Theory explains that banks play an intermediary purpose of distributing financing from savers to borrowers, generating income primarily through lending activities. Increased loan growth expands earning assets and enhances interest income, thereby improving profitability. According to research by Ma'aji et al. (2025) Excessive loan growth can pose risks to banking but positively affects Bank Profitability due to the expansion of the bank's loan portfolio. However, study by Nguyen & Le (2022) found that Loan Growth positively impacts profitability, meaning that by providing more loans, the bank earns more interest income from those loans, resulting in increased bank profitability. However, the bank's capacity to control risk declines as credit demand rises, resulting in an increase in loans that are in default.

Consequently, the bank's profit decreases, and reduced loan growth can negatively affect the bank's Profitability (Obiedallah & Abdelaziz, 2024). Therefore, loan growth is expected to influence bank performance, where increased lending can enhance profitability through higher interest income, provided that credit risk is effectively managed.

H_5: Loan Growth Effects Bank Performance

Efficiency Effect on Bank Performance

The Efficiency Structure Theory implies that firms with elevated efficiency are in a better position to minimize costs and maximize output, leading to improved profitability. In banking, efficiency is often evaluated by the cost-to-income ratio. Lower ratios indicate better cost management and higher profitability. Regarding to the study by Ma'aji et al. (2025) efficiency improves bank profitability, meaning that efficiency can optimise expenses and enhance profitability and competitiveness for banks. Banks with a good level of cost efficiency tend to increase profitability because they can optimise the use of their resources(Trang et al., 2021). This deviates from research by Zhao et al. (2025) found that efficiency measured by the cost-to-income ratio has a negative affect on bank profitability. High efficiency weakens the bank's use to utilise capital also makes it more difficult to generate more income for the bank. In essence, efficiency is expected to significantly influence bank performance, as effective cost management improves profitability, although excessive cost-cutting may limit the bank's income-generating capacity.

H_6: Efficiency Effects Bank Performance

RESEARCH METHODS

This study uses purposive sampling for group selection in this research. This researchis based on quantitative data and employs existing data methods. The dataset utilized in this study come using the Indonesia Stock Exchange website(www.idx.co.id) and the relevant bank websites. This study has a sample of 205 financial statement periods based on 41 banks during a 5-year period (2020-2024). The following are the measurements for each variable. The study employed purposive sampling to draw the group according to the listed criteria:

(1) Banks included in the Indonesia Stock Exchange throughout 2020–2024

(2) Banks with complete financial statements

(3) Banks that report consistent data for all variables

Table 1
Variables and Research Indicators

Variable name	Symbol	Indikator	Source
Return on average assets	ROAA	$\frac{net\ income}{average\ of\ total\ assets}$	Ma'aji et al. (2025)
Bank capital	BnCap	$\frac{Total\ equity}{total\ assets}$	Ma'aji et al. (2025)
Liquidity risk	LqRisk	$\frac{Liquid\ Asset}{Total\ Assets}$	Ma'aji et al. (2025)
Credit Risk	CrRisk	$\frac{loans\ loss\ provision}{gross\ loans}$	Ma'aji et al. (2025)
Bank size	BnSize	Ln*(Total Assets)*	Ma'aji et al. (2025)
Loan growth	LnGrow	$\frac{Loan_t}{Loan_{t-1}}$	Ma'aji et al. (2025)
Efficiency	Bncost	$\frac{operating\ expense}{operating\ income}$	Kumar (2024)

Source: Data processed, 2026

This study employs panel data regression technique to examine the effect of independent variables, which are bank capital, credit risk, liquidity risk and control variables which are Bank size, Loan growth, Efficiency towards dependent variable, which is Bank Performance (bank's profitability) measured by Return on average asset. The outcomes of the regression specification in this study are presented as stated below:

$$\mathbf{ROAA} = 0.1978 + 0.058183\text{BnCap} - 0.049965\text{CrRisk} + 0.017220\text{LqRisk} + - 0.014654\text{BnSize} + 0.016011\text{LnGrow} - 0.011216\text{BnCost}$$

By taking into account the corrected R2, the determination coefficient test is used to assess how well independent factors can account for the variation in the dependent variable. Meanwhile, the partial effect of each independent variable on the dependent variable is assessed by the t-test. The following criteria are used to make decisions: the null hypothesis H_0 will be rejected if the t-test's significance value (sig) is less than 0.05, which reveals that the independent variable exerts a significant influence on the dependent variable. Meanwhile , if (sig $>$ 0.05), hipotesis H_0 can be accepted, implying that the independent variable does not significantly influence the dependent variable.

RESEARCH FINDINGS

Statistic Descriptives playing a role in summarising the fundamental data characteristics that is the subject of this study, also this information is organised to provide an initial overview of the variables that are the objects of the research and presented in the following format:

Table 2
Statistic Descriptives

	ROAA	BnCap	LqRisk	CrRisk	BnSize	LnGrow	BnCost
Mean	0.0113	0.2276	0.3382	0.0443	31.545	0.1160	0.8547
Median	0.0149	0.1674	0.2980	0.0340	31.036	0.0820	0.6607
Maximum	0.1930	1.4657	2.2550	0.2441	35.425	2.2944	13.004
Minimum	-0.3606	0.0553	0.0068	0.0014	27.996	-0.4735	0.0404
Std. Dev	0.0489	0.1847	0.2475	0.0362	1.7172	0.2967	1.0597
Skewness	-2.9895	3.2789	2.8349	2.1020	0.4463	3.5401	8.1421
Kurtosis	21.611	16.558	19.750	9.8004	2.3471	22.285	87.479
Jarque-Bera	3264.2	1937.5	2671.2	545.98	10.447	3605.2	63225.
Prob.	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000
Sum	2.3283	46.674	69.340	9.0842	6466.7	23.792	175.22
Sum Sq. Dev	0.4879	6.9592	12.501	0.2685	601.59	17.969	229.10
Observations	205	205	205	205	205	205	205

Source: Data processed by eviews 9, 2026

Table 3
Coefficient of Determination

Variabel Dependen	Model	R-Squared	Adjusted R-Squared
ROAA	Prob (F Statistic)	0.615735	0.503861

Source: Data processed by eviews 9, 2026

The purpose of the classical assumption test is to ensure that the regression model adheres to its fundamental premises so that the estimation results are valid and unbiased. These tests consisting of the normality test to verify data normality and the multicollinearity test to detect correlations between independent variables, the heteroscedasticity test to assess the equality of residual variances, and the autocorrelation test to detect any correlation among residuals in the model. The results indicate that all classical assumptions have been satisfied, therefore the regression model is appropriate for further analysis.

According to the research findings, the ROAA Model yields an Adjusted R^2 value of 0.503861. means that the independent variables composed of Bank Capital, Credit Risk, Liquidity risk and control variables consisting of bank size, Loan Growth, Efficiency can

describe the variability of the dependent variable return on average asset sebesar 50.3861% and the remaining 49.6139% , indicates that ROAA is driven by factors not accounted for in this mode

Table 4
T-Test

	ROAA		
	COEEF	PROB	Results
BnCap	0.058183	0.0152	Positive effect
LqRisk	0.017220	0.4492	No effect
CrRisk	-0.049965	0.6620	No effect
BnSize	-0.014654	0.1955	No effect
LnGrow	0.016011	0.1189	No effect
BnCost	-0.011216	0.0003	Negative effect

Source: Data processed by eviews 9, 2026

According to the outcomes of Table 4, it shows that bank capital has a positive and substantial impact on the bank's financial results when measured by ROAA, and efficiency has a negative affect on the bank's financial performance. Conversely, Liquidity Risk, Credit Risk, Bank Size, and Loan Growth do not show a substantial impact on the bank's financial performance. These outcomes confirm that bank capital has the potential to drive improvements in bank financial performance, while not statistically impacting the Indonesian banking sector according to the analysed data.

DISCUSSION

Bank Capital Effect on Bank Performance

According to outcomes of this panel data regression analysis, it shows that bank capital significantly positive impact on bank performance measured by ROAA. The regression results demonstrate the independent variable has a positive and statistically impact the dependent variable. This finding implies that an improvement in the independent variable is associated with an improvement in the dependent variable. The outcome supports underlying theoretical framework, suggesting that the variable plays a vital role in enhancing the outcome variable. Furthermore, The result of this study aligns with prior research findings, reinforcing the robustness of the relationship observed in this research This variable obtained a coefficient of 0.058183 with a probability of 0.0152 thus null hypothesis H_0 is not supported and H_1 is supported by the results. This finding implies that higher capital levels enhance bank profitability. From a theoretical standpoint, this is in accordance with with Capital Buffer Theory,

which states strong capital provides protection against financial shocks and enables banks to maintain durability during economic uncertainty. Banks with higher capitalization are more capable of absorbing risks, reducing the likelihood of financial distress, and sustaining their operational activities. In addition, higher capital provides banks to expand lending activities and invest in productive assets, thereby increasing income generation. This supports the Financial Intermediation Theory, where banks utilize their financial resources to generate profits through efficient fund allocation. The findings indicate that linear to the study by Ma'aji et al. (2025) which found that Bank Capital has a positive impact on bank profitability, this is due to banks with higher capitalisation being able to increase business income and reduce costs, thereby enhancing bank profitability. As stated by Adelopo et al. (2022) Supports this study, as Bank Capital positively impact bank profitability because bank capital is primarily obtained from retained earnings or by issuing shares. Thus, profitability and equity are the main factors contributing to bank capital, so with high capital, it can support its operational activities, including an increase in credit distribution and an enhancement of bank service facilities, thereby increasing profitability. According to research by Serly Jennifer (2021) Bank Capital improves bank profitability because high capital banks can easily withstand issues such as debt The regression outcomes show that the independent variable exerts a positive and statistically significant influence on the dependent variable. This suggests that an increase in the independent variable corresponds to a rise in the dependent variable. The result is in line with the underlying theoretical framework, indicating that the variable plays a key role in improving the outcome variable. In addition, this finding aligns with the results of prior studies, reinforcing the robustness of the relationship observed in this research.

Liquidity Risk Effect on Bank Performance

Regarding to the outcomes of this panel data regression test, it shows that liquidity risk does not impact bank performance measured by ROAA. The results show that the independent variable does not have a statistically significant effect on the dependent variable. This suggests that changes in the independent variable do not meaningfully influence the dependent variable within the context of this study. The finding may indicate that other factors play a more dominant role in determining the outcome variable. Additionally, this result could be attributed to differences in sample

characteristics, measurement approaches, or contextual conditions compared to previous studies. This variable obtained a coefficient of 0.017220 with a probability of 0.4492, thus the null hypothesis H_0 is rejected and H_2 is accepted. This suggests that variations in liquidity risk do not significantly influence profitability within the observed sample. From a theoretical standpoint, although the Liquidity Preference Theory suggests a trade-off between liquidity and profitability, the insignificant result implies that banks in this study may have achieved an optimal level of liquidity management. This finding suggests that banks are able to maintain sufficient liquidity without compromising profitability, possibly due to effective asset-liability management strategies. In other words, liquidity risk may already be well-controlled, reducing its direct effect on performance. The results is inconsistent with the research by Ma'aji et al. (2025). However, it is consistent with the research by Fitriani & Maharani (2024) that liquidity risk does not affect bank profitability, possibly due to the nature of credit distribution, which tends to vary from bank to bank over time. This indicates that changes in liquidity risk values, whether increasing or decreasing, do not always affect financial results. Regarding to the study by Pratiwi et al. (2024) Liquidity risk does not have a significant impact because banks are quite cautious when disbursing funds to maintain their liquidity. The magnitude of liquidity risk is more influenced by management strategies and policies in managing liquid assets. The results show that the independent variable does not have a statistically significant effect on the dependent variable. This suggests that changes in the independent variable do not meaningfully influence the dependent variable within the context of this study. The finding may indicate that other factors play a more dominant role in determining the outcome variable. Additionally, this result could be due to variations in sample characteristics, measurement approaches, or contextual conditions compared to previous studies.

Credit Risk Effect on Bank Performance

Regarding to the outcomes of this panel data regression test, it shows that Credit risk is unable to impact bank performance measured by ROAA. The results show that the independent variable does not significantly effect on the dependent variable. This suggests that changes in the independent variable do not meaningfully influence the dependent variable within the context of this research. The finding may indicate that other factors play a more dominant role in determining the outcome variable.

Additionally, this result could be attributed to differences in sample characteristics, measurement approaches, or contextual conditions compared to previous studies. This variable obtained a coefficient of -0.049965 with probability of 0.6620 thus hypothesis H_0 is accepted dan H_3 is rejected. his suggests that fluctuations in credit risk do not directly affect profitability in this study. Although the Risk-Return Trade-Off Theory suggests that higher credit risk should reduce profitability due to potential loan defaults, the insignificant result may indicate that banks have implemented effective credit risk management practices. Banks may mitigate credit risk through mechanisms such as loan screening, diversification, and provisioning policies (e.g., PPAP), which reduce the impact of non-performing loans on profitability. The results indicate that this is not linear to the study by Ma'aji et al. (2025). However, it is consistent with the research by Bintoro & Rahmadhani (2021) that credit risk does not impact the profitability of banks because the bank's sources of income are derived from a variety of additional funding in addition to credit, such as fees and charges associated with the services they provide or charges levied on services provided by the bank. According to research by Sri Apriani et al. (2023)credit risk does not have an effect on profitability because banks are still able to implement a credit management system through adequate Provision for Impairment of Productive Assets (PPAP). Credit risk does not impact the profitability of banks because it is possible to reduce the likelihood that debtors will not fulfill their obligations through the implementation of effective risk management (Silviana & Cahyani Putri, 2025). The results show that the independent variable does not significantly effect on the dependent variable. This suggests that changes in the independent variable do not meaningfully influence the dependent variable within the context of this study. The finding may indicate that other factors have a more dominant role in determining the outcome variable. Additionally, this result could be due to variations in sample characteristics, measurement approaches, or conditions compared to previous studies.

Bank Size Effect on Bank Performance

Regarding to the outcomes of this panel data regression test, it reveals liquidity risk fails to impact bank performance measured by ROAA. The results show that the independent variable does not significantly effect on the dependent variable. This suggests that changes in the independent variable do not meaningfully influence the

dependent variable within the context of this study. The finding may point to the dominance of other factors in determining the outcome variable. Additionally, this result could due to variations in the group characteristics, measurement approaches, or contextual conditions compared to previous studies. This variable obtained a coefficient -0.014654 with a probability of 0.1955 thus null hypothesis H_0 is accepted dan H_4 is rejected. The results indicate that this is linear to the investigation by Ma'aji et al. (2025). According to the Economies of Scale Theory, major banks are expected to achieve cost savings and stronger market power. However, the insignificant result indicates the presence of diseconomies of scale, where increased size leads to higher operational complexity and inefficiencies. Large banks often face higher administrative costs, bureaucratic inefficiencies, and challenges in managing extensive operations, which may offset the benefits of scale. However, it is consistent with study undertaken by Amelia Putri et al. (2022) These findings indicate a larger size does make banks more well-known to the public, but the size of the assets does not automatically reflect the ability to generate higher profits. Large bank size does not guarantee improved performance because large banks face challenges such as higher operational costs, complex organisational structures, and efficiency that is not always optimal. According to research by Syachreza & Mais (2020) bank size does not affect bank profitability due to commercial banks no longer rely solely on asset quality to enhance profitability, but instead require income generated from financing product activities. The results show that the independent variable does not have a significantly effect on the dependent variable. This suggests that changes in the independent variable do not meaningfully influence the dependent variable within the context of this study. The finding may indicate that exert a greater effect in a more dominant participation in determining the outcome variable. Additionally, this result could be due to variations in sample characteristics, measurement approaches, or conditions compared to previous studies.

Loan Growth Effect on Bank Performance

Regarding to the outcomes of this panel data regression test, it shows that liquidity risk does not impact bank performance measured by ROAA. The results show that the independent variable does not have a statistically significant effect on the dependent variable. This suggests that changes in the independent variable do not meaningfully influence the dependent variable within the context of this study. The

finding may indicate that other factors play a more dominant role in determining the outcome variable. Additionally, this result could be attributed to differences in sample characteristics, measurement approaches, or contextual conditions compared to previous studies. This variable obtained a coefficient of 0.016011 with a probability of 0.1189 thus hypothesis H_0 is accepted and H_5 is rejected. The outcomes indicate the fact they are not linear to the study by Ma'aji et al. (2025). This suggests that an increase in lending does not automatically lead to higher profitability. Although the Financial Intermediation Theory posits that loan expansion should increase income through interest earnings, the insignificant result implies that the effectiveness of loan utilization is more important than the volume of loans itself. This may occur because not all loans are immediately productive or generate returns within the same period. Additionally, rapid loan growth may be accompanied by increased credit risk, which can offset potential gains. However, they are supported with the research by Nurjanah & Imronudin (2023) that loan growth does not affect bank profitability, meaning that whether loan growth increases or decreases, it does not affect bank profitability because the loans disbursed may not yet be effectively converted into interest income. According to the research by YILDIRIM (2022) that loan growth does not significantly affect bank profitability because other factors such as asset quality, risk control, and operational efficiency have a stronger affect on profitability compared to just the increase in loan volume. The results show that the independent variable does not significantly effect on the dependent variable. This suggests that changes in the independent variable do not meaningfully contribute the dependent variable within the context of this study. The finding may indicate that other factors play a more dominant role in determining the outcome variable. Additionally, this result could be due to variations in sample characteristics, measurement approaches, or contextual conditions compared to previous studies.

Efficiency Effect on Bank Performance

The regression results reveal that the independent variable has a negative and statistically significant effect on the dependent variable. This indicates that an increase in the independent variable leads to a decrease in the dependent variable. The finding suggests that the variable may act as a limiting factor, reducing the performance of the dependent variable. This result aligns with theoretical expectations and prior empirical

evidence, highlighting the inverse relationship between the variables.This variable obtained a coefficient of -0.011216 with a likelihood of 0.0003, thus the null hypothesis H_0 is rejected dan H_6 is accepted. From the perspective of the Efficiency Structure Theory, efficient cost management should enhance profitability; however, the negative relationship suggests that the banks in this study experience operational inefficiencies. A high cost-to-income ratio reflects that a large portion of income is used to cover operational expenses, leaving less profit for the bank. This indicates poor cost control and suboptimal resource allocation. The results indicate that these findings are not consistent with the research Ma'aji et al. (2025) but are in accordance with the study by Zhao et al. (2025) that efficiency measured by the cost-to-income ratio negatively impacts bank profitability. Higher efficiency leads to a decrease in bank profitability. Efficiency measured by the cost-to-income ratio negatively affects bank profitability because a high cost-to-income ratio reveals that a significant segment of operational income is to cover costs, which can reduce the overall efficiency and profitability of the bank (Tri Wijayanti et al., 2025). The regression results reveal that the independent variable has a negative and statistically significant effect on the dependent variable. This indicates that growth in the independent variable causes a decrease in the dependent variable. The evidence suggests that the variable may act as a limiting factor, reducing the performance of the dependent variable. This result aligns in theoretical expectations and past empirical evidence, highlighting the inverse relationship between the variables.

CONCLUSION

Many empirical findings demonstrate that bank capital plays a vital positive role in enhancing performance, showing that high capitalized banks are more resilient in absorbing financial shocks and ensure market confidence. This suggests that capital strength serves not merely as a mandated requirement as well as planned resource that supports sustainable profitability. In contrast, the insignificant effects of credit risk, liquidity risk, bank size, and loan growth imply that these variables may not directly influence bank profitability within the observed context. This could indicate that banks have implemented effective risk management practices, thereby mitigating the potential adverse effects of these factors, or that their impact is conditional upon other macroeconomic or institutional variables.

Furthermore, efficiency is found to have a significantly negative effect on bank performance, highlighting that huge cost-to-income ratios reflect operational inefficiencies. This finding implies that excessive operational expenses can erode profitability, emphasizing the importance of cost control and operational optimization. From a managerial perspective, these results underline the need for banks to strengthen their capital structure while simultaneously improving cost efficiency through better resource allocation and streamlined internal processes. Rather than focusing solely on expansion indicators such as size or loan growth, bank managers should prioritize financial discipline and operational effectiveness as key drivers of performance.

However, this research contains several limitations. The exclusion of macroeconomic variables, such as inflation, may limit the comprehensiveness of the analysis. Prior research by El Aboudi et al. (2025) , suggests that inflation can positively influence bank performance by increasing interest income and adjusting lending rates, despite its potential to raise operational costs. Therefore, future research is recommended to incorporate macroeconomic factors to enhance understanding of the key determinants of bank performance in a more integrated manner.

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