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THE IMPACT OF FINANCIAL RISKS ON BANK PERFORMANCE IN INDONESIA COMMERCIAL BANKS

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ABSTRACT

This study examines how financial risks affect the performance of banks listed on the Indonesia Stock Exchange, with return on equity (ROE) as the primary profitability metric. The study, covering the period 2020 to 2024, employs a regression model to ensure a robust and comprehensive analysis. The data includes audited annual financial statements from selected banks. Macroeconomic indicators, such as GDP growth and inflation, are sourced from the Central Bank of Indonesia (BI) and the World Bank (WB). This study explores critical financial risks affecting bank performance, focusing on credit, liquidity, and operational risks. The study also considers the impact of bank size, GDP growth, and inflation rates on bank performance. The analysis reveals a clear negative impact of these financial risks on bank performance: higher liquidity and operational risks are associated with lower financial performance. At the same time, bank size also positively impacts performance, as larger banks are associated with improved financial performance. This underscores the importance of financial risk management in effectively monitoring and controlling key performance indicators in consolidated commercial banks. Furthermore, both macroeconomic conditions and bank-specific attributes are shown to influence financial results significantly. By offering an in-depth perspective on risk management strategies, this study provides practical recommendations to enhance financial stability and strengthen the resilience of commercial banks in Indonesia in the evolving economic landscape.

Keywords : Banking; Financial Performance; Liquidity; Operationa; Risk

ABSTRAK

Penelitian ini mengkaji bagaimana risiko keuangan mempengaruhi kinerja bank-bank yang terdapat dalam Bursa Efek Indonesia, dengan laba atas ekuitas (ROE) sebagai metrik profitabilitas utama. Studi ini, yang mencakup periode 2020 hingga 2024, menerapkan model regresi untuk memastikan analisis yang kuat dan menyeluruh. Data tersebut mencakup laporan keuangan tahunan yang telah diaudit dari bank-bank terpilih. Sementara itu, indikator makroekonomi seperti pertumbuhan PDB dan inflasi bersumber dari Bank Sentral Indonesia (BI) dan Bank Dunia (WB). Studi ini mengeksplorasi risiko keuangan kritis yang mempengaruhi kinerja bank, dengan fokus pada risiko kredit, likuiditas, dan operasional. Studi ini juga mempertimbangkan dampak ukuran bank, pertumbuhan PDB, dan tingkat inflasi terhadap kinerja bank. Analisis menunjukkan dampak negatif yang jelas dari risiko keuangan ini terhadap kinerja perbankan karena risiko likuiditas dan risiko operasional yang lebih tinggi dikaitkan dengan penurunan kinerja keuangan serta adanya dampak positif dari ukuran bank terhadap kinerja perbankan yang dikaitkan dengan besarnya ukuran bank sejalan dengan peningkatan kinerja keuangan. Hal ini menggarisbawahi pentingnya manajemen risiko keuangan dalam memantau dan mengendalikan indikator kinerja utama secara efektif di bank umum gabungan. Lebih lanjut, baik kondisi makro ekonomi maupun atribut spesifik bank terbukti mempengaruhi hasil keuangan secara signifikan. Dengan menawarkan perspektif mendalam tentang strategi manajemen risiko, studi ini memberikan rekomendasi praktis untuk meningkatkan stabilitas keuangan dan memperkuat ketahanan bank komersial di Indonesia dalam lanskap ekonomi yang terus berkembang.

Kata Kunci : Kinerja Keuangan; Likuiditas; Operasional; Perbankan; Risiko

INTRODUCTION

The banking sector plays a crucial role in a country's economy. It serves as an intermediary institution that channels funds to individuals, companies, and governments, thus stimulating economic activity (Javid et al., 2020). The stability and performance of the banking sector are the main foundation for maintaining a healthy financial system and supporting sustainable economic growth (Ngo & Trinh, 2025). This strategic role makes bank financial performance a key indicator for assessing the resilience and sustainability of the national financial system (Ogundele & Nzama, 2025).

In their operations, banks face various financial risks that can significantly affect financial performance (Ogundele & Nzama, 2025). Credit risk is a key risk. It arises from borrowers' inability to meet their loan repayment obligations (Ozili, 2024). A rise in non-performing loans causes major bank failures and challenges the banking sector in many countries (Jampion Mwakabalula & Mwamkonko, 2024). Non-performing loans reduce a bank's ability to generate profits and reflect the unhealthy financial condition of borrowers (Iqbal & Nosheen, 2023). An increasing non-performing loan ratio also raises a bank's risky assets and impacts financial performance (Chun & Ardaaragchaa, 2024). Research shows that credit risk, as measured by the non-performing loans ratio, has a significant negative impact on bank performance, as measured by Return on Equity (ROE) (Ngo & Trinh, 2025).

Liquidity risk is also a significant factor influencing bank financial performance (Ogundele & Nzama, 2025). It arises when a bank cannot meet its short-term obligations in a timely manner. Failing to do so may incur high additional costs or disrupt financial stability (Bilal et al., 2024). Poor liquidity management can undermine customer trust and damage a bank's reputation (Yahaya et al., 2022). Liquidity risk is highly dependent on the bank's ability to manage third-party funds effectively and on its funding structure (Ngo & Trinh, 2025). Banks with low capital ratios and high credit risk are more affected by liquidity risk, leading to greater financial performance impacts (Boamah et al., 2023). Empirical studies have found that liquidity risk significantly reduces ROE in commercial banks (Ngo & Trinh, 2025).

Operational risk is a major concern in modern banking due to increased reliance on technology, more complex business processes, and growing competition (Ramdani et al., 2024). This risk relates to internal process failures, human error, system disruptions, and external events that may lead to financial losses (Jadwani et al., 2024). Most operational risk events are unlikely, but their effects can be severe for a bank's financial stability and performance (Ramdani et al., 2024). Events like the global financial crisis and the COVID-19 pandemic demonstrate that operational risk can significantly affect banking performance across countries

(Jadwani et al., 2024). Research indicates that operational risk has a significant negative impact on banking performance, as measured by ROE (Ngo & Trinh, 2025).

This study measures banking financial performance using Return on Equity (ROE). ROE measures a bank's ability to generate profits for shareholders relative to its capital (Nodeh et al., 2021). It also demonstrates how effectively management uses financial resources to create shareholder value (Molyneux & Nguyen, 2021). Besides internal risks, bank financial performance is influenced by external factors such as bank size, inflation, and economic growth (Chen et al., 2023).

Bank size reflects a bank's business scale and the total assets it holds to support operations (Nodeh et al., 2021). Larger banks usually have broader market reach, a wider product range, and better access to funding (Rahmawati, 2020). These advantages allow large banks to achieve economies of scale. This increases efficiency and profitability (Rahmawati, 2020). However, very large banks can face operational inefficiencies, more complex management, and higher risks, which may depress financial performance (Bhagat et al., 2021). Thus, the effect of bank size on ROE continues to show mixed results and needs further study (Singh & Patel, 2025).

Inflation is a macroeconomic variable that influences banking performance. It affects interest rates, consumer purchasing power, and credit risk (Al-Tamimi & Jreisat, 2020). Moderate inflation can raise bank interest income by increasing lending rates and boosting ROE (Adeoye & Akinlo, 2021). However, high inflation can reduce borrowers' repayment capacity. It also increases the risk of non-performing loans, which harms bank financial performance (Mohamed & Hassan, 2024). Conflicting research on inflation's impact on ROE yields inconsistent results. This highlights the need for further study (Al-Tamimi & Jreisat, 2020).

Besides inflation, Gross Domestic Product (GDP) growth strongly affects banking performance (Chen et al., 2023). High economic growth drives business and consumer activity. This boosts credit demand and bank interest income (Chen et al., 2023). However, high economic growth can also increase operating costs and inflation. This may reduce profitability (Molyneux & Nguyen, 2021). The link between GDP growth and ROE needs more study, especially in Indonesian banking (Chen et al., 2023).

This study directly examines how credit risk, liquidity risk, operational risk, bank size, inflation, and economic growth jointly shape the financial performance of Indonesian commercial banks, measured by ROE. By isolating these variables, the research precisely addresses inconsistencies in prior findings and aims to provide concrete empirical evidence on their impacts.

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This research clarifies how financial risk and macroeconomic factors interact to affect bank performance, directly addressing unresolved contradictions in prior studies (Ogundele & Nzama, 2025; Al-Tamimi & Jreisat, 2020).

In practice, this study aims to help bank management develop more effective risk management strategies. This would enhance financial performance and bank stability (Ngo & Trinh, 2025). For investors, the findings may give a useful reference when assessing bank performance and risk. This can support more rational investment decisions (Rahmawati, 2020). Regulators may also use the results of this research to help guide banking supervisory policies. These policies could help maintain national financial system stability (Ogundele & Nzama, 2025).

This study specifically anticipates revealing that increased liquidity risk and operational risk are likely to reduce ROE, while larger bank size is expected to improve ROE due to economies of scale. Additionally, it is anticipated that the effects of inflation and economic growth on ROE will vary depending on current macroeconomic conditions and how well banks adapt. Clearly outlining these expected outcomes aims to guide banks in prioritizing risk management and adaptability for strong, sustainable performance.

LITERATURE REVIEW AND HYPOTHESIS DEVELOPMENT

Bank Performance

Law Number 10 of 1998 states that a bank is a business entity that collects public deposits and distributes funds as credit or other means to improve living standards. Thus, banks serve as vital sources of economic financing (Khemiri, 2025). They provide financial support to individuals, companies, and governments (Javid S, Farooqi M, Shoukat A, Rasheed A., 2020). Kim (2024) notes that banks are primarily funded by shareholders and depositors and must meet regulatory capital requirements.

This study measures bank financial performance using Return on Equity (ROE), which reflects profit generation for shareholders and considers capital structure (Abdelmoneim, 2023). ROE is more sensitive to changes in risk and efficiency than ROA, as profit fluctuations directly affect equity-based returns (Ghafel, 2024). Across countries, ROE determinants differ by financial system regime, underscoring the need for analysis in the context of financial structures and crisis cycles (Bilal et al., 2024). Therefore, using ROE as a dependent variable helps assess how risk shocks (credit, liquidity, and operational) and macroeconomic factors (inflation and GDP growth) impact shareholders' returns (Abdelmoneim, 2023). The relationship between ROE and these factors is not always linear due to differences in business models, regulatory regimes, and economic cycles (Abdelmoneim, 2023).

Most studies show that deteriorating asset quality (increased NPLs) reduces ROE, as profits are eroded by provisioning costs, loan losses, and lower interest income (Eshun, 2025). In Ghana, a higher NPL ratio has a significant negative effect on ROE (Eshun, 2025). In Nepal, liquidity risk positively affects profitability, whereas credit and operational risks negatively affect profitability (Poudel et al., 2024). In Islamic banks in the MENA region, operational risk, measured by the efficiency ratio (operating expenses/total assets), is significantly associated with lower ROE (Jamil, 2023). Many studies use ROA or NIM as proxies for profitability, but ROE models yield inconsistent results because ROE is influenced by leverage and capital policy. Thus, ROE-based research requires further testing in specific contexts (Ghafel, 2024).

Credit Risk and Bank Performance

Credit risk plays a crucial role in maintaining banking sector stability because it directly impacts portfolio quality and a bank's ability to disburse financing (Salman Abdou D, Farag K, Ali L., 2025). Credit risk arises when a creditor fails to fulfill its obligations according to agreed terms, resulting in financial losses for the financial institution (Obi E, FADUN O, IJIMAKINWA B., 2025). Financial Services Authority Regulation Number 40/POJK.03/2019 concerning Asset Quality Assessment of Commercial Banks classifies credit quality into current, special mention, substandard, doubtful, and loss. Alnabulsi K, Kozarević E, and Hakimi A (2023) categorize substandard, doubtful, and loss loans as non-performing loans (NPLs).

Theoretically, increasing NPLs depresses ROE by increasing provisioning costs, lowering effective interest income, increasing collection burdens, and increasing the risk of credit losses (Ozili, 2025). High NPLs tend to reduce bank profitability, including ROE, because higher NPLs weaken the bank's ability to generate net income (Zabin, 2024). Research by Ngo & Trinh (2025) found a significant negative effect between credit risk, as measured by NPLs, and bank performance, as measured by ROE. Research by Adeyemi & Lawal (2024) also found a negative relationship between NPLs and profitability, where a 1% increase in NPLs significantly reduced bank performance. Empirical evidence on Tunisian banks also indicates a link between NPLs and profitability and suggests a potentially reciprocal relationship in banking dynamics (Ameur, 2024).

Research results across countries are often inconsistent due to differences in definitions/proxies for credit risk, observation periods, and restructuring and liquidity support policies during crises (Ozili, 2025). Some studies emphasize that, in certain periods, buffer policies (e.g., authority support/delayed loss recognition) can reduce the impact of NPLs on profitability or delay their recognition (Bilal et al., 2024). Cross-country/regional studies show that NPLs tend to depress bank profitability, but the magnitude of the impact varies depending on funding structure and risk management policies (Ozili, 2025). Many studies examine NPLs

only partially or focus on ROA/NIM, yielding inconsistent evidence on ROE (which is sensitive to leverage/capital structure) across settings (Ameur, 2024).

Some studies examine NPLs without simultaneously controlling for liquidity and operational risk, even though, in practice, NPLs often increase in tandem with funding stress and rising operational costs of handling non-performing loans (Ozili, 2025). Therefore, the analysis of NPLs relative to ROE will be more robust when tested alongside other risk variables and macro controls (Zabin, 2024). Based on this review, the first hypothesis in this study is formulated as follows:

H1: Credit risk has a negative effect on banking performance.

Liquidity Risk and Bank Performance

Liquidity risk arises when a bank is unable to meet its financial obligations as they fall due (Abu Khalaf & Awad, 2024). This risk is considered a significant risk compared to other banking risks due to its potential for bankruptcy or bank runs, particularly when banks are unable to meet customer withdrawal requests. To create liquidity, banks must finance less liquid assets with more liquid liabilities (Ghenimi A, Chaibi H, Omri M., 2021).

Liquidity risk is proxied by the liquidity risk ratio and is hypothesized to negatively impact bank performance (Bilal et al., 2024). Cross-country literature confirms that banks with weak liquidity management incur higher funding costs and the risk of defaulting on short-term obligations, ultimately depressing equity-based profitability (Abu Khalaf & Awad, 2024). Studies in the GCC region show that the relationship between liquidity risk and bank performance varies across financial systems. Therefore, research results often appear mixed if this structure is not taken into account (Bilal et al., 2024). Specifically, Bilal et al. (2024) found that liquidity can be positively associated with performance in bank-based systems, but not always significantly in market-based systems, suggesting that financial structure can be a source of inconsistency in the findings.

A multi-country study in the MENA region also found that liquidity indicators are significantly related to bank profitability, suggesting that liquidity management quality is crucial for maintaining shareholder returns (Abu Khalaf & Awad, 2024). Empirical findings showing a negative relationship generally indicate that liquidity shortages erode depositor confidence, damage reputations, and increase costs, thereby depressing performance (Bilal et al., 2024). Abu Khalaf & Awad (2024) state that uncontrolled liquidity problems can negatively impact capital and profitability, and even lead to the failure of financial institutions. Research by Mehdi R, Ahmed I, and Mohamed E. (2025) found that liquidity risk significantly impacts banking performance. These findings align with Nguyen & Pham's research. (2022), which found that

liquidity risk significantly negatively impacts bank performance, as decreasing cash reserves increases the risk of default.

The differences in results often stem from variations in liquidity risk proxies and differences in bank funding strategies (Bilal et al., 2024). Furthermore, several studies emphasize that liquidity's impact on ROE can change during crises due to the central bank's role in supplying liquidity, which exerts funding pressure on profitability (Bilal et al., 2024). Therefore, testing liquidity risk on ROE in a panel model that incorporates macro controls (GDP growth, inflation) is crucial to avoid bias due to economic cycle conditions (Abdelmoneim, 2023). Based on this review, the second hypothesis in this study is formulated as follows:

H2: Liquidity risk has a negative effect on banking performance.

Operational Risk and Bank Performance

Operational risk is a type of risk that may arise from internal process failures, human error, system failures, or external events (Ofori B, Padi A, Musah A., 2025). Ramdani et al. (2024) suggest that operational risk is difficult to measure, insure, or manage using conventional methods. Operational risk can be assessed based on the probability and magnitude of internal control weaknesses that lead to unexpected losses due to external events. The size of the board of directors, board independence, a strong audit committee, and strict regulatory oversight are some ways to reduce the likelihood of operational risk (Jadwani et al., 2024).

Operational risk is proxied by the operational risk ratio. A study of banks in Ghana confirmed that governance mechanisms and company size characteristics can be related to the level of operational risk and ultimately to the bank's financial performance (Ofori et al., 2025). These findings reinforce the argument that operational risk is not only about operational costs but also about governance and internal controls, which determine process quality and the incidence of fraud or operational losses (Ofori et al., 2025).

Qabajeh M et al. (2023) demonstrate that operational risk has a direct negative impact on bank profitability. Akinnagbe (2024) reinforces this, finding that higher operational risk significantly reduces financial performance. Collectively, this evidence shows operational risk is a critical factor in bank success.

Many studies inadequately capture operational risk by using cost-based proxies, thereby underestimating the impact of extreme ("tail") operational risk events on metrics such as ROE (Ofori et al., 2025). Ozili (2025) argues that examining operational risk alongside other risk variables in the ROE framework is essential for accurate assessment of profit pressure and return on equity. Based on this review, the third hypothesis in this study is formulated as follows:

H3: Operational risk has a negative effect on banking performance.

Bank Size and Bank Performance

Bank size is generally defined as total assets, reflecting a bank's scale of operations, intermediation capacity, and financial strength within the financial system. Therefore, it is often used as a primary indicator of bank size in international banking research (Nguyen, Vo, & Tran, 2021; Saif-Alyousfi, Saha, & Md-Rus, 2020). In empirical research, bank size is commonly measured using the natural logarithm of total assets (Ln Total Assets) to reduce scale differences across banks and improve the stability of model estimates (Ozili, 2021; Khan, Panait, & Saeed, 2022). Theoretically, banks with larger total assets can gain economies of scale, improve operational efficiency, and expand portfolio diversification and funding sources (Le, Tran, & Hoang, 2020; Mensi, Rehman, Al-Yahyaee, & Kang, 2021). However, increasing bank size can also increase operational complexity and internal coordination costs, potentially reducing managerial efficiency and increasing risk if not balanced by good governance (Duong, Phan, & Vo, 2020; Danisman & Demirel, 2021). However, cross-country findings also confirm the existence of a "too-big-to-manage effect," whereby larger size actually increases complexity, coordination costs, and potential inefficiencies, resulting in lower ROE in certain bank groups (Bortoluzzo et al., 2024).

Contradictory evidence emerges: some studies find that bank size significantly increases profitability, while others find the effect weakens or is insignificant after controlling for risk, funding structure, and bank heterogeneity (Doğan & Yildiz, 2023). These differing results are consistent with the template's guidance that the effect of bank size on performance can vary, as excessive size can potentially lead to inefficiencies and increased risk. Therefore, further testing is warranted (Singh & Patel, 2025).

Empirically, the effect of bank size on financial performance is mixed. Some studies find a positive effect on profitability, while others show no significant effect on ROE compared to liquidity and risk management factors (Abdelaziz, Rim, & Helmi, 2021; Banna, Hassan, & Rashid, 2022; Adegbite & Lawal, 2024; Tran, Lin, & Nguyen, 2023).

Critically, contradictory results regarding the effect of bank size on ROE often arise due to differences in market structure and regulations, differences in business models (e.g., fee-based vs. credit-based banks), and differences in methods (GMM/dynamic vs. static) that alter the direction and significance of the coefficients (Rumaly, 2023). The gap in focus is the need to test whether bank size remains a significant factor in ROE when combined with risk variables and macroeconomic conditions, particularly in the context of developing countries following a shock that can shift the efficiency of scale mechanism from a scale-based to a complexity-based one (Doğan & Yildiz, 2023). Based on this review, the fourth hypothesis in this study is formulated as follows:

H4: Bank size has a positive effect on banking performance

Inflation and Bank Performance

Inflation is a sustained increase in general prices that reduces the real value of money and affects purchasing power, production costs, and consumption and investment decisions in the economy (Mankiw, 2021; García & López, 2022). In the banking sector, inflation impacts interest income, asset quality, and operating costs. Moderate inflation can increase interest income through adjustments in lending rates, while high inflation can increase the risk of non-performing loans and depress bank profitability (Adeoye & Akinlo, 2021; Al-Tamimi & Jreisat, 2020). Inflation is also closely related to central bank monetary policy, which controls price stability through changes in benchmark interest rates, which directly affect interest income, the cost of funds, and bank asset quality (Bernanke, 2020; Mishkin, 2021; Zhang, Wang, & Chen, 2023). Inflation affects banks' ROE through adjustments in interest rates, cost of funds, and credit quality. Its effect depends largely on how quickly banks can pass through prices and interest rates to their asset-liability portfolios (Mano, Stanga, & Zeng, 2025).

Some findings suggest that inflation can erode profitability by raising operating costs and reducing borrowers' repayment capacity, thereby increasing the cost of risk and depressing ROE (Ghafel, 2024). However, other studies suggest that, under certain conditions, inflation can be neutral or ambiguous for ROE if banks can adjust credit pricing faster than the increase in the cost of funds, thereby preventing a sharp decline in interest margins (Mano et al., 2025). Empirical research indicates that inflation tends to negatively affect banks' Return on Equity (ROE), particularly during crises. Although inflation can be related to profitability in the long run, its short-term impact is not always significant (García & López, 2022; Zhang et al., 2023).

Critically, the contradiction between inflation and ROE often arises because inflation is reflected not only in the CPI but also in monetary policy and the interest rate structure. Therefore, without controlling for the interest rate/monetary regime, the inflation coefficient can "capture" the policy effect rather than the pure inflation effect (Doğan & Yildiz, 2023). Thus, a prominent research gap is the need for studies that examine inflation in relation to ROE while controlling for financial risk and bank heterogeneity, as the impact of inflation may differ across large and small banks and those with different risk profiles (Rumaly, 2023). Based on this review, the fifth hypothesis in this study is formulated as follows:

H5: Inflation has a positive effect on banking performance.

Gross Domestic Product (GDP) Growth and Bank Performance

Gross Domestic Product (GDP) is a macroeconomic indicator that measures the total market value of all final goods and services produced within a country during a specific period, usually a year. According to Chen and Rodriguez (2022), GDP can be calculated using three

main approaches: the production approach, the income approach, and the expenditure approach. Meanwhile, Patel and Nguyen (2023) note that although GDP is a key indicator of economic growth, it has limitations in reflecting society's overall well-being. They argue that GDP does not account for income distribution, environmental degradation, or informal economic activity, all of which also affect the quality of life of a country's citizens. Therefore, they suggest using GDP alongside other indicators, such as the Human Development Index (HDI) or the Gini Ratio, to obtain a more comprehensive economic picture. In theory, economic growth (GDP growth) increases banks' ROE by boosting credit demand, transactions, and portfolio quality, thereby increasing profitability during expansionary phases (Abdelmoneim & Yasser, 2023).

Cross-country empirical evidence shows that GDP growth can have a positive and significant impact on bank profitability, particularly when improving macroeconomic conditions boost economic activity, increase demand for financing, reduce credit risk, and strengthen the banking intermediation function, ultimately driving increased profits attributable to shareholders (Abdelmoneim & Yasser, 2023). However, other studies indicate that GDP growth does not always strengthen ROE because expansionary phases can be accompanied by intense competition and aggressive credit expansion, which drive up operating and risk costs in subsequent periods, thereby weakening the net effect on ROE (Doğan & Yildiz, 2023). Research by Yuan et al. (2022) found that GDP has a positive and significant impact on bank performance. This aligns with research by Demir & Yilmaz (2021), which found that GDP growth has a positive effect, especially for large banks that can capitalize on economic growth opportunities. GDP growth is important, but its relationship with ROE remains underexplored because growth can coincide with operating cost pressures and inflation, which depress profitability (Chen et al., 2023).

Critically, the inconsistency of GDP growth with ROE is likely influenced by differences in economic structure, policy transmission, and institutional quality. Therefore, generalizing cross-country results to a specific context risks bias unless specifically tested in that context and period (Abdelmoneim & Yasser, 2023). Therefore, a significant research gap is the need to test GDP growth against ROE, accounting for its simultaneity with bank risk variables and other macroeconomic variables, as GDP growth can mask the risk trade-offs that arise during credit booms (Rumaly, 2023). Based on this review, the sixth hypothesis in this study is formulated as follows:

H6: GDP growth has a positive effect on bank performance

Based on the description of the factors that influence the impact of financial risk on bank performance, the conceptual framework that describes the influence of independent

variables (credit risk, liquidity risk, operational risk) and control variables (GDP growth rate, inflation, bank size) on the dependent variable (return on equity) is shown in Figure 1.

RESEARCH METHODOLOGY

Method is a method of work that can be used to obtain something. While the research method can be interpreted as a work procedure in the research process, both in searching for data or disclosing existing phenomena (Zulkarnaen, W., et al., 2020). The sampling method used in this study is purposive sampling, which involves selecting samples based on specific criteria within the population. This approach aligns with the variables used to ensure that the research results are more relevant and consistent with the study objectives. The selected sample consists of commercial banks listed on the Indonesia Stock Exchange (IDX) during the period 2020–2024. The criteria used in determining the sample are as follows:

1. Commercial banks listed on the IDX during the 2020–2024 period.
2. Banks that consistently publish audited financial statements with a fiscal year ending on 31 December throughout the study period.
3. Financial statement data are required to measure all variables used in this study.

This analysis aims to examine and analyze the effects of independent variables, namely credit risk (NPL), liquidity risk, and operational risk, as well as control variables, namely GDP growth rate, inflation, and bank size, on the financial performance of commercial banks listed on the Indonesia Stock Exchange. This study employs EViews 9 for data processing, using several stages of analysis, including descriptive statistics, hypothesis testing, and panel-data regression. Panel data regression analysis consists of three estimation approaches: common effects, fixed effects, and random effects. A series of tests is conducted to determine the most appropriate estimation model for analyzing the impact of independent variables on the dependent variable, namely the financial performance of commercial banks. These tests include the Chow Test, Hausman Test, and Lagrange Multiplier Test. The flowchart of the estimation model selection process is presented in Figure 2.

Financial performance in this study is measured using the dependent variable return on equity (ROE), as described by Ngo and Trinh (2025), which is calculated using the following formula:

$$\text{ROE} = \frac{\text{Net income after tax}}{\text{Equity}}$$

Credit risk, measured by the non-performing loans (NPL) ratio, as described by Ngo and Trinh (2025), is calculated using the following formula:

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$$\text{NPL } ratio = \frac{\text{Non-performing loans}}{\text{Total loans}}$$

Liquidity risk, measured by the liquidity risk ratio, as described by Ngo and Trinh (2025), is calculated using the following formula:

$$Liquidity\ risk\ ratio = \frac{\text{Total loans}}{\text{Total deposits}}$$

Operational risk, measured by the operational risk ratio, as described by Ngo and Trinh (2025), is calculated using the following formula:

$$Operational\ risk\ ratio = \frac{\text{Operating expenses}}{\text{Total income}}$$

GDP growth rate, as described by Ngo and Trinh (2025), is calculated using the following formula:

GDP = Published by General Statistics Office

Inflation, as described by Ngo and Trinh (2025), is calculated using the following formula:

INF = Published by General Statistics Office

Bank size, as described by Ngo and Trinh (2025), is calculated using the following formula:

Bank Size = Total assets at year-end

RESEARCH RESULTS AND DISCUSSION

This study uses secondary data from financial statements of banking sector companies listed on the Indonesia Stock Exchange (IDX) from 2020 to 2024. The data were sourced from www.idx.co.id. Through purposive sampling, 41 banking companies were selected as the research sample.

Descriptive Statistics

Descriptive statistics are data analysis techniques that provide an overview of data using statistical indicators such as minimum, maximum, mean, and standard deviation. The minimum and maximum values show the lowest and highest observed values for each variable. The mean represents the average value of each variable, reflecting its central tendency. The standard

deviation measures how spread out the values are for each variable, indicating whether the data are similar (homogeneous) or varied (heterogeneous). Descriptive statistics thus offer quantitative summaries of the characteristics of each research variable. Based on Table 1, the financial performance variable has a minimum of -1.239266, a maximum of 0.209361, a standard deviation of 0.148223, and a mean of 0.025882. The credit risk variable has a minimum of 0.000126, a maximum of 0.222658, a standard deviation of 0.026114, and a mean of 0.032366. The liquidity risk variable has a minimum of 0.296057, a maximum of 5.279067, a standard deviation of 0.490600, and a mean of 0.912617. The operational risk variable has a minimum of 0.337341, a maximum of 2.878609, a standard deviation of 0.338564, and a mean of 0.904511. The bank size variable has a minimum of 27.99652, a maximum of 35.42552, a standard deviation of 1.724382, and a mean of 31.55917. The inflation variable has a minimum of 0.015700, a maximum of 0.055100, a standard deviation of 0.014799, and a mean of 0.026480. The GDP growth rate variable has a minimum of –0.020700, a maximum of 0.053100, a standard deviation of 0.028011, and a mean of 0.034040.

Model Selection Tests

Chow Test

The Chow test is used to determine

The Chow test is used to determine whether the common effect model or the fixed effect model is more appropriate. The hypotheses are formulated as follows:

H_0 = The appropriate model is the common effect model

H_a = The appropriate model is the fixed effect model

Based on Table 2, the Prob. Cross-Section Chi-Square value for return on equity is 0.0001 < 0.05, indicating that H_0 is rejected (H_1 is accepted). Thus, the Fixed Effects Model is more appropriate.

Hausman Test

The Hausman test is conducted to determine whether the fixed effect or random effect model is more suitable. The hypotheses are as follows:

H_0 = The selected model is the random effect model

H_a = The selected model is the fixed effect model

Based on Table 3, the Prob. Cross-Section Random value for return on equity is 1.0000 > 0.05, indicating that H_0 is accepted (H_1 is rejected). Therefore, the Random Effects Model is selected.

Lagrange Multiplier Test

The Lagrange Multiplier (LM) test is used to choose between the common effect and random effect models. The hypotheses are formulated as follows:

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H_0 = The selected model is the common effect model

H_a = The selected model is the random effect model

Based on Table 4, the Prob. Cross-Section Breusch–Pagan value for return on equity is 0.0006 < 0.05, indicating that H_0 is rejected (H_1 is accepted). Thus, the Random Effects Model is selected as the best model.

F-Test

The F-test is used to examine whether the independent variables jointly have a significant effect on the dependent variable and to assess the overall feasibility of the regression model. The hypotheses are stated as follows:

H_0: $\beta1 = \beta2 = \beta3 = \beta4 = 0$, meaning that none of the independent variables affect the dependent variable

Ha: $\beta1 \neq \beta2 \neq \beta3 \neq \beta4 \neq 0$, meaning that at least one independent variable affects the dependent variable

Based on Table 5, the Prob (F-Statistic) value is 0.000000 < 0.05, indicating that H_0 is rejected (Ha is accepted). This result confirms that at least one independent variable significantly affects the dependent variable and that the model is statistically fit.

Goodness of Fit Test

The Goodness of Fit test evaluates the extent to which the independent variables explain variations in the dependent variable. This is assessed using the Adjusted R-squared value. Based on Table 6, the adjusted R^2 value is 0.758704, indicating that 75.87% of the variation in bank performance (ROE) can be explained by the independent variables credit risk (NPL), liquidity risk, and operational risk and control variables bank size, GDP growth rate, and inflation. The remaining 24.13% is explained by other variables not included in the model. This result indicates that the model demonstrates a good level of explanatory power.

Hypothesis Test (T-test)

The T-test is used to examine whether each independent and control variable has a significant effect on the dependent variable. The hypotheses are as follows:

H_0 = Independent and control variables do not significantly affect the dependent variable

H_a = Independent and control variables significantly affect the dependent variable

In this study, the t-test is used to examine the magnitude of the effect of each independent variable on the dependent variable. Statistical hypothesis testing is conducted by referring to the probability values obtained from the analysis output generated by EViews 9 software. Hypothesis testing is also performed based on a significance level of 0.05.

Based on the t-test results presented in Table 7 for the return on equity (ROE) model, the credit risk variable has a significance value of 0.1881 > 0.05, indicating that H_0 is accepted.

Since the significance value exceeds the 0.05 threshold, it can be concluded that credit risk does not have a statistically significant effect on financial performance.

Based on the t-test results in Table 7 for the ROE model, the liquidity risk variable has a significance value of 0.0063 < 0.05, indicating that H_0 is rejected. The coefficient of –0.031452 suggests that an increase in liquidity risk tends to be followed by a decrease in financial performance, and vice versa. Given that the significance value is below 0.05, it can be concluded that liquidity risk has a significant negative effect on financial performance.

Based on the t-test results in Table 7 for the ROE model, the operational risk variable has a significance value of 0.0000 < 0.05, indicating that H_0 is rejected. The coefficient of –0.409401 indicates that an increase in operational risk tends to be followed by a decrease in financial performance, and vice versa. Since the significance value is below 0.05, it can be concluded that operational risk has a significant negative effect on financial performance.

Based on the t-test results in Table 7 for the ROE model, the bank size variable has a significance value of 0.0278 < 0.05, indicating that H_0 is rejected. The coefficient of 0.008334 suggests that an increase in bank size tends to be followed by an improvement in financial performance, and vice versa. As the significance value is below 0.05, it can be concluded that bank size has a statistically significant effect on financial performance.

Based on the t-test results in Table 7 for the ROE model, the inflation variable has a significance value of 0.9234 > 0.05, indicating that H_0 is accepted. The coefficient of –0.030942 suggests that an increase in inflation tends to be followed by a decrease in financial performance, and vice versa. Since the significance value exceeds 0.05, it can be concluded that inflation does not have a statistically significant effect on financial performance.

Based on the t-test results in Table 7 for the ROE model, the GDP growth rate variable has a significance value of 0.8353 > 0.05, indicating that H_0 is accepted. The coefficient of –0.036009 indicates that an increase in GDP growth rate tends to be followed by a decrease in financial performance, and vice versa. Since the significance value exceeds 0.05, it can be concluded that GDP growth rate does not have a statistically significant effect on financial performance.

Discussion

Effect of Credit Risk on Financial Performance (ROE)

The results of this study indicate that credit risk does not have a significant effect on financial performance (ROE). This finding is inconsistent with the study conducted by Ngo and Trinh (2025), which reports a significant negative effect of credit risk on bank financial performance as measured by ROE. Their findings are supported by Fred Nelson (2020), who reports that a 1-point increase in credit risk is associated with a 0.5568-point decrease in ROE.

Banks, as financial institutions, may experience credit risk due to inadequate management practices that lead to non-performing loans, the absence of efficient and effective mechanisms to control bad loans, the occurrence of bank-insider transactions in which some employees are involved in illegal activities that generate unrecoverable non-performing loans, as well as poor credit management practices that render techniques and decisions aimed at reducing bad loans ineffective (Al-Eitan & Bani-Khalid, 2019).

Effect of Liquidity Risk on Financial Performance (ROE)

The results of this study indicate that liquidity risk has a significant negative effect on financial performance (ROE), consistent with Ngo and Trinh (2025). When banks experience liquidity pressure difficulties in meeting short-term obligations—funding costs rise, and profitability (ROE) declines. Eltweri, Sawan, Al-Hajaya, and Badri (2024) and Hakimi and Zaghdoudi (2017) also report a significant negative impact of liquidity risk on ROE, noting that inadequate liquidity reduces lending income, narrows interest margins, and weakens bank performance and customer confidence when withdrawal demands are unmet.

Effect of Operational Risk on Financial Performance (ROE)

The results show that operational risk significantly and negatively affects financial performance (ROE), consistent with Ngo and Trinh (2025). Internal issues like inefficiencies, fraud, and operational failures increase costs and lower ROE. Muriithi and Muigai (2017) agree, explaining that banks can improve efficiency by reducing operational risk, but a balance between cost and revenue must be maintained.

Effect of Bank Size on Financial Performance (ROE)

The results of this study indicate that bank size has a significant positive effect on financial performance (ROE). This finding is supported by the study of Ngo and Trinh (2025), which reports that bank size has a significantly positive impact on financial performance as measured by ROE. The results are also consistent with the study by Sira Austin (2025), which finds that bank size has a positive and significant effect on financial performance, as measured by ROE. Ngo and Trinh (2025) further reinforce this evidence by confirming a positive and significant relationship between bank size and bank financial performance (ROE). However, this finding contrasts with the study by Bortoluzzo, Ciganda, and Bortoluzzo (2024), which finds a negative effect of bank size, measured by the logarithm of total assets, on bank profitability, proxied by ROE.

Effect of Inflation on Financial Performance (ROE)

The results of this study indicate that inflation does not have a significant effect on financial performance (ROE). This finding differs from that of Ngo and Trinh (2025), who report that inflation tends to have a significant positive effect on financial performance (ROE),

particularly in Bayesian estimation results. Their findings suggest that moderate inflation enables banks to raise lending rates, thereby improving profitability, provided inflation remains under control. Similarly, Mashrur and Tabassum (2023) find a positive and significant effect of inflation on bank financial performance as measured by ROE.

Effect of GDP Growth Rate on Financial Performance (ROE)

The results of this study indicate that GDP growth rate does not have a significant effect on financial performance (ROE). This finding is inconsistent with the study by Ngo and Trinh (2025), which reports a positive and significant effect of GDP growth rate on banking financial performance as measured by ROE. Similarly, Abdelmoneim and Yasser (2023) find that GDP growth has a positive and significant effect on bank profitability, as measured by ROE, across eight middle-income countries in the MENA and MINT regions. In addition, Doğan and Yildiz (2023) report that the GDP growth rate has a positive and significant effect on bank profitability measured by ROE, indicating that when GDP growth increases, bank profitability (ROE) tends to rise across all types of banks.

CONCLUSION

This study aims to analyze the effect of financial risk on the financial performance of banks listed on the Indonesia Stock Exchange during the 2020–2024 period using return on equity as an indicator of financial performance. The results show that liquidity risk and operational risk have a negative and significant effect on bank financial performance, indicating that higher liquidity risk and operational risk put greater pressure on the bank's ability to generate profits for shareholders. Furthermore, bank size has a positive and significant effect on financial performance, indicating that banks with larger asset bases can leverage economies of scale, improve operational efficiency, and diversify revenue sources. Conversely, non-performing loans, inflation, and GDP growth did not show a significant effect on bank financial performance during the study period, indicating that fluctuations in these factors have not been directly reflected in bank profitability as measured by ROE. These findings have practical implications for bank management: emphasize prudent liquidity and operational risk management, maintain capital adequacy, and optimally manage asset growth to improve bank financial performance and competitiveness. For investors, the results of this study illustrate that a bank's ability to manage liquidity and operational risks, and to maintain an efficient business scale, are important factors in assessing its health and financial performance prospects.

However, this study has several limitations that should be considered when interpreting the results. First, the observation period was relatively short, covering only five years, and thus did not fully capture the long-term dynamics and economic cycles that can impact bank financial performance. Second, the independent variables used in this study were limited to

credit risk, liquidity risk, and operational risk, along with several control variables such as bank size, inflation, and GDP growth. Therefore, it was not possible to account for other factors that could potentially influence bank financial performance. Therefore, further research is recommended to extend the study period to seven to ten years to obtain more comprehensive results. Furthermore, future research is expected to include other variables, such as lending interest rates, capital structure, corporate governance quality, and other macroeconomic factors, to deepen our understanding of the determinants of bank financial performance. By expanding the scope of variables and the research period, it is hoped that the results of this study will provide a more in-depth contribution to the development of academic literature and provide a basis for better decision-making for bank management, investors, and policymakers.

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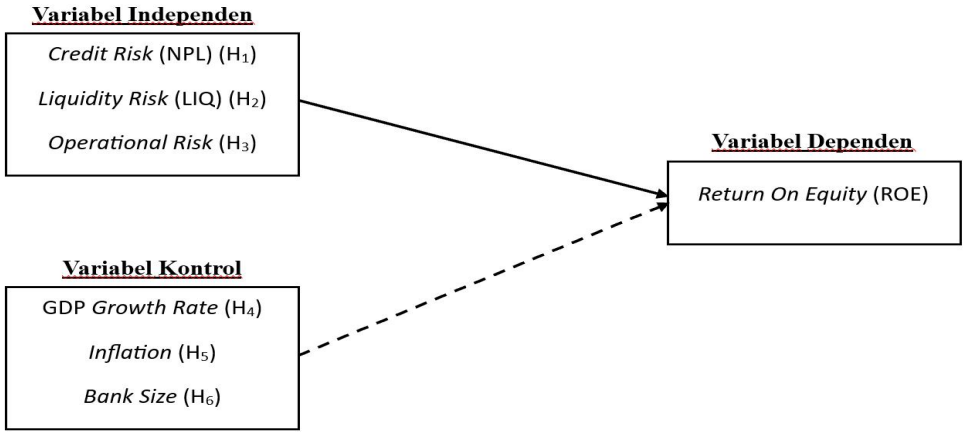
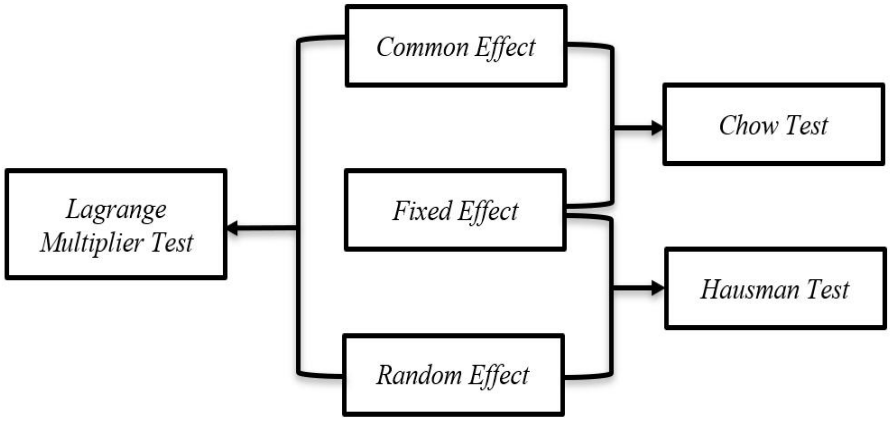
GAMBAR, GRAFIK DAN TABEL



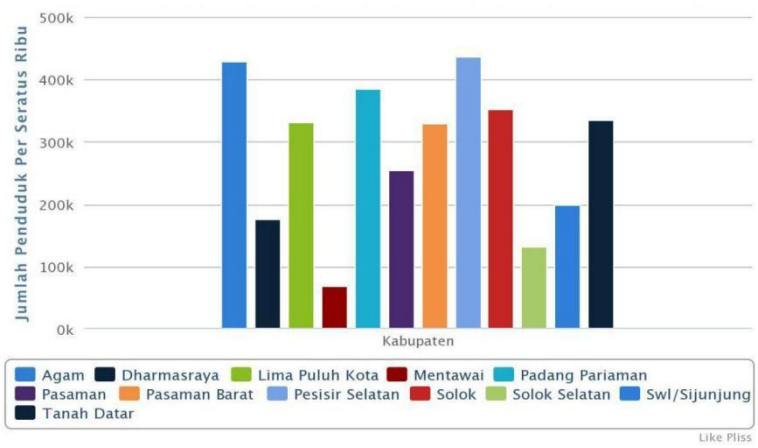
Gambar 1



Gambar 2

Tabel 1 Hasil Analisis Statistik Deskriptif

	N	Mean	Median	Maximum	Minimum	Std.Dev.
ROE	215	0.025882	0.038663	0.209361	-1.239266	0.148223
CRE	215	0.032366	0.027831	0.222658	0.000126	0.026114
LIQ	215	0.912617	0.828807	5.279067	0.296057	0.490600
OPE	215	0.904511	0.863338	2.878609	0.337341	0.328564
SIZE	215	31.55917	31.03642	35.42552	27.99652	1.724382
INFL	215	0.026480	0.018700	0.055100	0.015700	0.014799
GGDP	215	0.03404	0.050300	0.053100	-0.020700	0.028011



Grafik 1. Populasi Sumatera Barat menurut Kabupaten pada 2007
Sumber: www.bps.go.id

Tabel 1. Desain Eksperimental dan Hipotesis 3a dan 3b

Authority Head Factors	Religious Character Education Factor: Not Following Religious Character Education	Religious Character Education Factor: Following Religious Character Education
Authority Cheating	SEL 1	SEL 2
No Authority Cheating	SEL 3	SEL 4