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DETERMINANTS OF RETURN ON ASSETS IN BANKING COMPANIES LISTED ON THE INDONESIA STOCK EXCHANGE

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Abstract

This study aims to examine the effects of Non-Performing Loans (NPL), Shareholder Equity Ratio (SER), Solvency Ratio (SVR), and Liquidity Ratio (LR) as independent variables on Return on Assets (ROA) among banking companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period. A quantitative research approach was employed using secondary data obtained from the annual reports of the selected companies. The study sample comprised 33 banking companies, resulting in a total of 165 observations. Data were analyzed using panel data regression with the Random Effect Model (REM), processed through EViews version 13.0. The findings indicate that NPL and SVR have a negative and statistically significant effect on ROA, while LR has a positive and statistically significant effect on ROA. In contrast, SER does not exhibit a statistically significant effect on ROA.

Keywords: Shareholder Equity Ratio, Solvency Ratio, Return on Asset, Non-Performing Loan, Liquidity

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INTRODUCTION

Amid the dynamics of global economic integration, the banking sector plays a pivotal role as a financial intermediary by mobilizing public liquidity through deposit and savings instruments. These funds are subsequently allocated in the form of loans and financing, serving not only as a source of profitability but also as a key driver of national economic growth. The primary objective of banking operations is to maximize profitability, reflecting management's efficiency in optimizing available resources (Ratnasari et al., 2025). Consequently, the stability of banking performance largely depends on an institution's ability to mitigate risks related to solvency, liquidity, and credit quality while maintaining sustainable profitability in an increasingly competitive financial environment.

The stability and sustainability of banking operations can be assessed through financial performance. Profitability ratios constitute essential indicators for evaluating a bank's effectiveness in transforming its business activities into earnings (Nurfauziah et al., 2025). Among these indicators, Return on Assets (ROA) is widely recognized as a key measure of financial performance because it reflects the efficiency with which a bank utilizes its total assets to generate profits. Given that banking institutions manage substantial asset portfolios, including loans and investment securities, ROA provides a comprehensive assessment of management's ability to employ these assets productively.

The effectiveness of bank management in enhancing asset productivity and generating sustainable profits is reflected in its Return on Assets (ROA). This measure is particularly important in the banking industry due to the large volume of assets under management, such as loan portfolios and marketable securities, which require prudent and efficient administration. Consistent with the findings of Abusharbeh (2025), a higher ROA indicates greater managerial effectiveness in utilizing organizational resources to generate earnings. Similarly, Kasmir (2025) argues that net income represents the direct outcome of the efficient utilization of total assets. In practice, fluctuations in ROA are influenced by a bank's ability to manage credit risk through effective control of Non-Performing Loans (NPL), strengthen its capital structure through the Shareholder Equity Ratio (SER), and maintain long-term financial stability as reflected by the Solvency Ratio (SVR). The effective integration of these financial management practices ultimately supports the long-term stability and growth prospects of banking institutions.

The quality of earning assets in the banking sector is directly represented by the Non-Performing Loan (NPL) ratio. An increase in NPL indicates borrowers' inability to fulfill their repayment obligations on time and may signal

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deficiencies in the bank's credit assessment and risk management processes. According to Wijayanto et al. (2025), rising non-performing loans compel banks to increase their Allowance for Impairment Losses, thereby reducing operating profits. This condition not only decreases interest income but also increases provisioning expenses, limiting liquidity and reducing operational flexibility. Furthermore, Arhinful et al. (2025) argue that persistent credit risk undermines market confidence and constrains future lending activities, ultimately reducing Return on Assets (ROA) through the inefficient utilization of productive assets.

The Shareholder Equity Ratio (SER) measures the proportion of a bank's assets financed by shareholders' equity relative to its liabilities. This ratio serves as an important indicator of a bank's financial strength and its capacity to absorb operational losses without excessive reliance on debt or external financing. Rand, Sikhosana, and Lill (2025) contend that a higher SER reflects a stronger capital position, thereby enhancing a bank's resilience against various financial risks, including fluctuations in credit quality. Accordingly, adequate equity functions as a financial buffer that supports the continuity of banking operations during periods of economic uncertainty.

Moreover, the Shareholder Equity Ratio (SER) reflects investors' confidence in the financial fundamentals and long-term prospects of banking institutions. A strong equity base enables banks to expand lending activities prudently while maintaining a stable funding structure amid market volatility. Robust capitalization also provides management with greater strategic flexibility by reducing dependence on short-term financial obligations. As reported by Ayu Yulanda and Napisah (2025), improvements in the SER contribute positively to Return on Assets (ROA) because productive assets can be managed more efficiently when supported by a solid capital foundation.

A bank's ability to meet its long-term financial obligations, particularly under liquidation scenarios, is measured by the Solvency Ratio (SVR). This ratio serves as an indicator of financial independence and reflects a bank's resilience in responding to economic shocks (Ben Abdallah & Bahloul, 2025). A stable solvency position provides management with greater flexibility to invest in productive assets, thereby improving operational efficiency and enhancing Return on Assets (ROA). Nevertheless, Rachidy and Rasoi Nomenjanahary (2025) suggest that excessively high solvency ratios may indicate the underutilization of financial leverage. Since an appropriate level of debt financing can enhance profitability, the relationship between SVR and ROA is not necessarily linear but depends on managerial financial strategies and the broader business environment in which banks operate.

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Based on the aforementioned background and empirical phenomena, this study, entitled *Determinants of Return on Assets in Banking Companies Listed on the Indonesia Stock Exchange*, aims to examine the effects of Non-Performing Loans (NPL), Shareholder Equity Ratio (SER), Solvency Ratio (SVR), and Liquidity Ratio (LR), introduced as a novel explanatory variable, on Return on Assets (ROA) among banking companies listed on the Indonesia Stock Exchange (IDX).

LITERATURE REVIEW

Non-Performing Loans

In the banking industry, the Non-Performing Loan (NPL) ratio serves as a key indicator for assessing credit risk by comparing non-performing loans with total loans outstanding. An increase in the NPL ratio reflects a deterioration in asset quality, which may systematically constrain a bank's ability to generate profits. This adverse effect primarily arises from reduced interest income and higher loan loss provisions that banks must allocate to cover potential defaults. Empirical evidence provided by Ng et al. (2023) shows that, among banking companies listed on the Indonesia Stock Exchange (IDX) during the 2016–2020 period, NPL was negatively associated with Return on Assets (ROA), although the relationship was not statistically strong. These findings suggest that while deteriorating loan quality may reduce profitability, the magnitude of its impact depends on the prevailing macroeconomic environment and the period under examination. Similar evidence is reported by Kalkan (2025) in Türkiye and Arhinful, Mensah, et al. (2025) in the United States, both of whom conclude that rising non-performing loans significantly reduce banks' financial performance. Theoretically, this relationship is explained by declining interest income and increasing provisioning expenses, both of which reduce operational efficiency. In contrast, Rama Ali et al. (2024) found a positive relationship between NPL and ROA among Indonesian state-owned banks. This finding suggests that external factors, including government support, prudent risk management, and diversified revenue sources, may mitigate the adverse effects of non-performing loans. Therefore, the relationship between NPL and ROA is not universal but depends on institutional characteristics, managerial policies, and prevailing macroeconomic conditions.

Shareholder Equity Ratio

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The Shareholder Equity Ratio (SER) measures the proportion of a bank's operations financed by shareholders' equity relative to its liabilities. From a theoretical perspective, a strong capital base enhances a bank's resilience against financial risks while supporting its ability to generate profits. This argument is supported by Almanaseer (2024) in Jordan and Arhinful, Amin, et al. (2025), who found that stronger equity positions are positively associated with improvements in Return on Assets (ROA). However, Coleman (2023) reported contrasting evidence by identifying a negative relationship between SER and profitability. These inconsistent findings indicate that the contribution of equity capital to financial performance is not universal. Instead, its effectiveness depends largely on managerial decisions regarding capital allocation, risk management strategies, and the prevailing macroeconomic environment. Consequently, the extent to which shareholders' equity enhances ROA is determined by how efficiently the available capital is transformed into productive business activities.

Solvency Ratio

The Solvency Ratio (SVR) reflects a firm's capacity to meet its long-term financial obligations and withstand the risk of insolvency. In general, a sound solvency position indicates a strong financial structure capable of supporting sustainable business operations. Hor and Lim (2025), together with Bui et al. (2023), reported a positive relationship between solvency and Return on Assets (ROA), suggesting that stronger solvency enhances financial performance. Conversely, Rossela et al. (2024) and Nguyen (2024) documented a negative association between solvency and profitability. These contrasting findings imply that the effect of solvency on financial performance is context-dependent and may vary across industries, research methodologies, and the control variables employed in empirical analyses. Accordingly, the influence of solvency on profitability should be interpreted within the broader institutional and economic environment in which firms operate.

Liquidity Ratio

Liquidity is a critical aspect of banking operations because it reflects a bank's ability to meet its short-term financial obligations while maintaining normal business activities. Adequate liquidity enables banks to satisfy withdrawal demands, extend new loans, and respond effectively to unexpected funding needs without disrupting operational stability. Maintaining an appropriate level of liquidity therefore contributes to public confidence and supports the sustainability of banking operations.

From a financial performance perspective, an adequate Liquidity Ratio (LR) allows banks to manage cash flows more efficiently and minimize liquidity

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risk, thereby improving operational performance and profitability. However, maintaining excessive liquidity may result in idle assets that generate relatively low returns, reducing the efficient utilization of productive resources. Consequently, the relationship between liquidity and Return on Assets (ROA) is not necessarily linear but depends on how effectively management balances liquidity needs with profit-generating activities. An optimal liquidity position enables banks to maintain financial stability while maximizing the productive use of their assets, ultimately contributing to improved profitability.

RESEARCH METHOD

Conceptual Framework

The relationship between credit risk and profitability has produced mixed findings in the recent literature. Rachidy et al. (2025) and Wijayanto et al. (2025) reported a positive association between Non-Performing Loans (NPL) and Return on Assets (ROA), whereas Atisu et al. (2024) documented a negative relationship. These inconsistent findings suggest that the impact of credit risk on profitability is highly contingent upon banks' risk management practices and the quality of their loan portfolios. Similar inconsistencies are observed for the Shareholder Equity Ratio (SER). Mahisi and Usman (2024) as well as Chau et al. (2025) found that stronger equity positions contribute positively to profitability, while Rachidy et al. (2025) reported a negative relationship. These contrasting results indicate that financing policies and capital structures do not necessarily generate uniform outcomes across banking institutions. Likewise, with respect to the Solvency Ratio (SVR), Panjaitan (2024) and Rachidy et al. (2025) identified a positive effect on profitability, whereas Afriyenti et al. (2024) found evidence of a negative association. These findings imply that the effectiveness of solvency depends largely on how banks utilize financial leverage and allocate their assets efficiently.

With regard to the Liquidity Ratio (LR), Abusharbeh (2025) and Al-Salih (2024) reported a positive and significant relationship with Return on Assets (ROA), suggesting that adequate liquidity supports operational stability and enhances financial performance. In contrast, Aditya et al. (2025) documented a negative relationship, indicating that excessive liquidity may result in idle funds and reduce the efficient utilization of productive assets. Overall, the divergent findings regarding NPL, SER, SVR, and LR demonstrate that the determinants of ROA are not universal. Rather, the effects of these variables are influenced by managerial decision-making, banks' portfolio structures, and the prevailing macroeconomic environment during the period of analysis. Based on the

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theoretical and empirical relationships among these variables, the conceptual framework of this study is presented as follows.

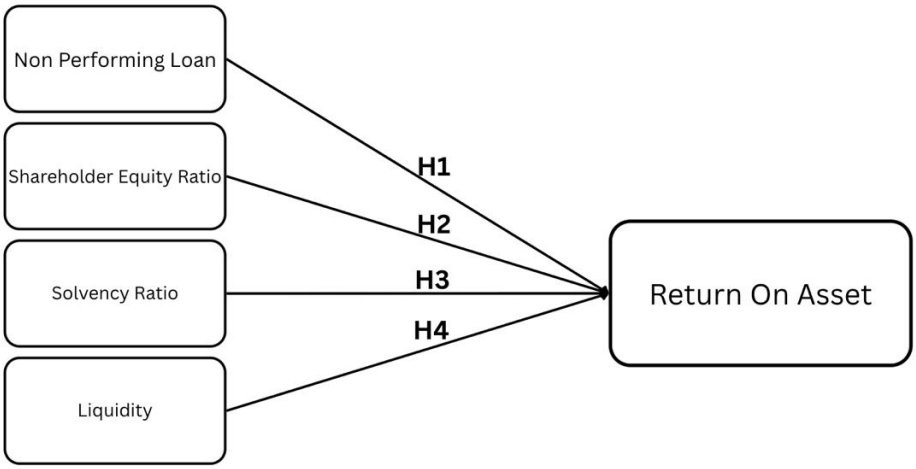

Figure 1.
Conceptual Framework

Hypothesis Development

The Effect of Non-Performing Loans on Financial Performance

The relationship between Non-Performing Loans (NPL) and profitability has produced mixed findings in the international banking literature. Ng et al. (2023) found that, among banking companies listed on the Indonesia Stock Exchange (IDX) during the 2016–2020 period, NPL was negatively associated with financial performance, although the relationship was not statistically significant. In contrast, Rama Ali et al. (2024) reported a significant positive relationship between credit risk and Return on Assets (ROA) among Indonesian state-owned banks. This finding differs substantially from the evidence presented by Kalkan (2025) in the Turkish banking sector and Arhinful, Mensah, et al. (2025) in the United States, both of whom concluded that non-performing loans consistently reduce bank profitability and financial performance in the short term. Collectively, these studies suggest that although NPL generally exerts an adverse effect on profitability, the magnitude and direction of its impact depend on institutional characteristics, regulatory frameworks, and the market environment in which banks operate.

H_1: Non-Performing Loans (NPL) have a significant effect on Return on Assets (ROA).

The Effect of Shareholder Equity Ratio on Financial Performance

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The relationship between equity financing and financial performance has been widely discussed in the finance literature. Almanaseer (2024), in a study of Jordanian firms, and Arhinful, Amin, et al. (2025) found that a stronger Shareholder Equity Ratio (SER) contributes positively to improvements in Return on Assets (ROA). In contrast, Coleman (2023) reported a negative relationship between equity financing and profitability. These inconsistent findings indicate that the effect of capital structure is not universal but varies according to economic conditions, institutional risk profiles, and the period under investigation. Accordingly, the contribution of shareholders' equity to financial performance depends on how effectively equity capital is utilized to support productive business activities.

H_2: Shareholder Equity Ratio (SER) has a significant effect on Return on Assets (ROA).

The Effect of Solvency Ratio on Financial Performance

The relationship between the Solvency Ratio (SVR) and financial performance has also yielded inconsistent empirical evidence. Hor and Lim (2025), together with Bui et al. (2023), found that stronger solvency positions are positively associated with Return on Assets (ROA), suggesting that financially sound institutions are better equipped to generate sustainable profitability. Conversely, Rossela et al. (2024) and Nguyen (2024) documented a negative relationship, arguing that excessively high solvency may reflect the underutilization of financial leverage and reduce returns on assets. These conflicting findings indicate that the impact of solvency on profitability is influenced by differences in financial strategies, institutional characteristics, and macroeconomic conditions.

H_3: Solvency Ratio (SVR) has a significant effect on Return on Assets (ROA).

The Effect of Loan-to-Deposit Ratio on Financial Performance

The efficiency of financial intermediation, as reflected by the Loan-to-Deposit Ratio (LDR), has been widely recognized as an important determinant of banking profitability. Sam et al. (2025), together with Wijayanto et al. (2025) and Latif et al. (2022), reported that a well-managed LDR contributes positively to Return on Assets (ROA). From a theoretical perspective, banks that effectively transform deposits into productive earning assets while maintaining adequate liquidity are more likely to achieve superior financial performance. However, Amarasinghe (2022) argued that excessively aggressive lending policies may adversely affect profitability. This view is supported by Obeidat et al. (2021), who suggested that an excessively high LDR may weaken liquidity, increase

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provisioning costs, and elevate default risk, thereby reducing net income. Therefore, the effect of LDR on ROA depends largely on management's ability to maintain an appropriate balance between credit expansion and liquidity management.

H_4: Loan-to-Deposit Ratio (LDR) has a significant effect on Return on Assets (ROA).

Data Analysis Method

The panel data regression model employed in this study was adapted from the model proposed by Twairesh (2025) and is specified as follows:

ROA = -0.077337 - 0.009437**NPL** + 0.005544**SER** - 0.010040**SVR** + 0.117416**LR**

Information:

β = Constant (Intercept)
β_{1-4} = Coefficients
ROA = Return on Asset
NPL = Non-Performing Loan
SER = Shareholder Equity Ratio
SVR = Solvency Ratio
LR = Liquidity
I = Intercept
t = Period (Time)
Ɛ = Error Term

Based on the empirical findings, the following conclusions can be drawn:

1. **Non-Performing Loans (NPL)** have a negative and statistically significant effect on **Return on Assets (ROA)**.
2. **Shareholder Equity Ratio (SER)** does not have a statistically significant effect on **Return on Assets (ROA)**.
3. **Solvency Ratio (SVR)** has a negative and statistically significant effect on **Return on Assets (ROA)**.
4. **Liquidity Ratio (LR)** has a positive and statistically significant effect on **Return on Assets (ROA)**.

RESEARCH METHOD

This study employs a hypothesis-testing research design to examine the causal relationships between the independent variables—Non-Performing Loans (NPL), Shareholder Equity Ratio (SER), Solvency Ratio (SVR), and Liquidity Ratio

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(LR)—and the dependent variable, Return on Assets (ROA). The analytical framework proposed by Rachidy et al. (2025), which was originally developed in the context of the African banking industry, serves as the foundation for this study. To enhance the relevance and applicability of the model, it is adapted to reflect the institutional characteristics and regulatory environment of banking companies listed on the Indonesia Stock Exchange (IDX). This contextual adaptation is intended to provide a more comprehensive understanding of the relationships among the study variables within Indonesia's banking sector and to identify the key determinants of bank profitability.

Variables and Measurement

The operationalization of variables in this study is designed to establish measurable quantitative indicators representing the relationships between the independent variables and the dependent variable. Defining these indicators is essential to ensure measurement accuracy, data consistency, and the reliability of the empirical model. Each variable is measured using financial ratios that have been widely adopted in the banking and finance literature, thereby facilitating objective analysis and ensuring comparability across the sample firms.

Table 1.
Variables and Measurement

Type of Variables	Variable Name	Symbol	Formula	Reference
Variabel Dependen	*Return On Asset*	ROA	$\frac{Net\ Income}{Total\ Asset}\ x\ 100\%$	Rachidy et al,. (2025)
Variabel Independen	*Non Perfroming Loan*	NPL	$\frac{Non\ Performing\ Loan}{Total\ Loans}\ x\ 100\%$	Rachidy et al,. (2025)
	Shareholder Equity Ratio	SER	$\frac{Total\ Asset}{Total\ Equity}\ x\ 100\%$	Rachidy et al, (2025)
	Solvency Ratio	SVR	$\frac{Total\ Liabilitas}{Total\ Assets}$	(Rachidy et al, 2025)
	Liquidity	LR	$\frac{Total\ Loans}{Total\ Deposits}\ x\ 100\%$	(Isinta, 2025)

RESULTS AND DISCUSSION

Data Collection Method

This study utilizes secondary data obtained from publicly available and verified sources. Specifically, the data were collected through a systematic review of annual financial reports published on the official website of the Indonesia Stock Exchange (IDX). The use of secondary data ensures the credibility and reliability

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of the analysis, as the financial information has been audited and publicly disclosed. Furthermore, the use of historical financial data enhances research efficiency in terms of both time and resources, as the required information is readily accessible for academic purposes through the official IDX database (www.idx.co.id).

Sampling Method

The sample for this study was selected using a purposive sampling technique, whereby the sample was determined based on predefined selection criteria. This approach was adopted to ensure that the selected observations were relevant to the research objectives and adequately represented the phenomenon under investigation. By applying purposive sampling, the study was able to identify banking institutions that met the required characteristics, thereby improving the validity and reliability of the empirical analysis. The sample selection criteria are as follows:

1. Conventional banks that were continuously listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period.
2. Conventional banks that continuously published audited annual financial reports throughout the 2020–2024 period.

Table 2.
Sample Selection Using the Purposive Sampling Method

Description	Number
Banking companies listed on the Indonesia Stock Exchange (IDX) during the 2020–2024 period	47
Islamic banks	(4)
Conventional banks with incomplete financial statement data during the observation period	(8)
Total sample (analysis units)	**35**
Total observations over the five-year period	**140**

Model Selection Tests

Chow Test

The Chow test is employed to determine the most appropriate panel data estimation model between the Common Effects Model (CEM) and the Fixed Effects Model (FEM). The primary objective of this test is to assess whether cross-sectional heterogeneity should be explicitly accounted for or whether a pooled regression model is sufficient. Specifically, the Chow test evaluates two competing hypotheses: the null hypothesis (H_0), which assumes that there are no individual-specific effects across cross-sectional units, and the alternative

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hypothesis (H_1), which suggests the presence of individual-specific effects. If the null hypothesis is rejected, the Fixed Effects Model (FEM) is considered more appropriate because it accounts for the unique characteristics of each cross-sectional unit. Conversely, failure to reject the null hypothesis indicates that the Common Effects Model (CEM) provides a more appropriate and efficient specification for the data.

The hypotheses of the Chow test are formulated as follows:
H_0: *Common Effect Model*
H_a: *Fixed Effect Model*
The decision criteria for the Chow test are as follows:

- If the Cross-section Chi-square probability is greater than or equal to 0.05 (5% significance level), H_0 is not rejected, indicating that the Common Effects Model (CEM) is the appropriate model.
- If the Cross-section Chi-square probability is less than 0.05 (5% significance level), H_0 is rejected, indicating that the Fixed Effects Model (FEM) is the appropriate model.

Based on the results of the Chow test, the Cross-section Chi-square probability is 0.0000, which is lower than the 5% significance level (0.05). Therefore, H_0 is rejected (H_1 is accepted), indicating that the Fixed Effects Model (FEM) is the most appropriate estimation model for this study.

Hausman Test

Following the Chow test, the Hausman test is conducted as the next stage in the panel data model selection procedure. The Hausman test is designed to compare the Fixed Effects Model (FEM) and the Random Effects Model (REM) in order to determine which model provides more consistent parameter estimates.

Specifically, the test examines whether the individual-specific effects are correlated with the explanatory variables included in the model. If a significant correlation is detected, the assumptions underlying the Random Effects Model (REM) are violated, indicating that the Fixed Effects Model (FEM) is the more appropriate specification because it accounts for unobserved individual heterogeneity. Conversely, if no significant correlation is found, the Random Effects Model (REM) is preferred due to its greater estimation efficiency. The hypotheses of the Hausman test are formulated as follows:
H_0: *Random Effect Model*
H_a: *Fixed Effect Model*
Decision Criteria:

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- If the Cross-section Random probability is greater than or equal to 0.05 (5% significance level), H_0 is not rejected, indicating that the Random Effects Model (REM) is the appropriate estimation model.
- If the Cross-section Random probability is less than 0.05 (5% significance level), H_0 is rejected, indicating that the Fixed Effects Model (FEM) is the appropriate estimation model.

Based on the results of the Hausman test, the Cross-section Random probability is 0.2062, which is greater than the 5% significance level (0.05). Therefore, H_0 is not rejected (H_1 is rejected), indicating that the Random Effects Model (REM) is the most appropriate estimation model for this study.

Lagrange Multiplier Test

The final stage of the panel data model selection procedure involves the Lagrange Multiplier (LM) test, which is conducted to determine the most appropriate model between the Random Effects Model (REM) and the Common Effects Model (CEM). The primary objective of the LM test is to examine whether individual-specific random effects are present in the residuals of the panel regression model. Specifically, the test evaluates whether the variation across cross-sectional units is sufficiently significant to justify the use of the Random Effects Model or whether the Common Effects Model provides an adequate specification under the assumption of cross-sectional homogeneity. Selecting the appropriate estimation model is essential to ensure efficient parameter estimates and to accurately represent the underlying structure of the panel data. The hypotheses of the Lagrange Multiplier test are formulated as follows:

H_0: The appropriate model is the Common Effect.

H_a: The appropriate model is Random Effect.

If the cross-section Breusch–Pagan probability is less than $\alpha = 0.05$, H_0 is rejected. This indicates that H_a is accepted, and the Random Effect Model (REM) is the most appropriate model.

If the cross-section Breusch–Pagan probability is greater than $\alpha = 0.05$, H_0 is accepted. This indicates that H_a is rejected, and the Common Effect Model (CEM) is the most appropriate model.

Based on the Lagrange Multiplier test, the results show that the cross-section Breusch–Pagan probability is 0.0031, which is less than 0.05. Therefore, H_0 is rejected, and H_a is accepted, indicating that the Random Effect Model (REM) is the appropriate model to be used.

Data Analysis Method

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Coefficient of Determination Test (Adjusted R^2)

Based on the goodness-of-fit evaluation, the adjusted R-squared value was 0.418174. This result indicates that the research model, which incorporates Non-Performing Loan (NPL), Shareholder Equity Ratio (SER), Solvency Ratio (SVR), and Liquidity (LR), explains 41.8174% of the variation in Return on Assets (ROA). The remaining 58.1826% of the variation is attributable to other factors not included in the current model. Although external variables contribute substantially to the unexplained variation, the findings demonstrate that the combination of the independent variables has adequate explanatory power with respect to the profitability performance of the firms. These results suggest that credit risk management, capital structure, solvency, and liquidity are fundamental determinants influencing overall financial performance.

Simultaneous Significance Test (F-Test)

The statistical analysis shows that the probability value of the F-statistic is 0.000000, which is well below the significance level of 0.05. This finding provides empirical evidence that Non-Performing Loan (NPL), Shareholder Equity Ratio (SER), Solvency Ratio (SVR), and Liquidity (LR) jointly have a statistically significant effect on Return on Assets (ROA). The results confirm that the combined influence of these four variables adequately explains the variation in the firms' financial performance. Given the highly significant probability value, the estimated regression model is considered to exhibit a good fit and is both valid and reliable for explaining the phenomenon examined in this study.

RESULTS AND DISCUSSION

Descriptive Statistical Analysis

The descriptive statistics of the Return on Assets (ROA) variable reveal considerable disparities in profitability performance among the sampled banks. The highest ROA was recorded by PT Bank Mestika Dharma Tbk (BBMD) in 2020, reaching 0.182223, whereas the lowest value of −0.739864 was reported by PT Bank JTrust Indonesia Tbk (BCIC) during the same period. Overall, the average ROA was 0.008945. Notably, the standard deviation of 0.071291, which exceeds the mean value, indicates substantial data dispersion and the presence of extreme observations (outliers). These findings suggest significant heterogeneity in asset utilization efficiency across the banking institutions included in the sample, reflecting fundamental differences in each bank's ability to generate profits amid economic fluctuations.

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The descriptive analysis of the Non-Performing Loan (NPL) variable indicates variations in asset quality across the sampled banks. The highest NPL ratio was 0.099410, recorded by PT Bank KB Bukopin Tbk (BBKP) in 2021. Conversely, the lowest value of 0.000000 was observed for PT Bank Jago Tbk (ARTO) in 2020, reflecting minimal credit risk exposure during that period. On average, the banking industry recorded an NPL ratio of 0.027232, with a standard deviation of 0.016527. Although differences in credit quality exist among the institutions, the distribution of NPL values is relatively more stable than that of ROA. This finding indicates that while profitability performance varies considerably, credit risk management practices across the sampled banks tend to be more standardized.

The descriptive statistics for the Shareholder Equity Ratio (SER) illustrate considerable variation in the capital structures of the sampled banks. The highest SER value of 18.07140 was reported by PT Bank Tabungan Negara Tbk (BBTN) in 2020, whereas the lowest value of 1.492513 was recorded by PT Bank Jago Tbk (ARTO) in 2021. The average SER was 6.220122, with a standard deviation of 2.799341. This relatively high level of dispersion reflects substantial differences in internal financing strategies, indicating that each banking institution adopts a distinct capital structure to support its operational sustainability.

The descriptive analysis of the Solvency Ratio (SVR) provides an overview of the banks' capacity to meet their long-term financial obligations. The highest SVR value of 0.900745 was achieved by PT Bank Nationalnobu Tbk (NOBU) in 2021, while the lowest value of 0.298692 was recorded by PT Bank Jago Tbk (ARTO) during the same year. Overall, the average SVR was 0.741215, with a relatively low standard deviation of 0.100466. This modest level of dispersion indicates that the distribution of SVR values is more concentrated and stable than that of ROA. These findings suggest a relatively homogeneous solvency structure among the sampled banks, with limited variation in their long-term financial resilience.

The descriptive statistics of the Loan Ratio (LR) reveal substantial disparities in lending activities among the sampled banks. The highest LR value of 416,420.9 was reported by PT Bank KB Bukopin Tbk (BBKP) in 2021, whereas the lowest value of 11.98281 was recorded by PT Bank Capital Indonesia Tbk (BACA) during the same period. The average LR was 6,475.256, while the standard deviation reached 44,688.86, indicating an extremely wide dispersion and the presence of significant outliers. These findings suggest considerable differences in lending strategies across banks, with some institutions adopting highly aggressive lending policies while others remain relatively conservative.

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Such disparities have direct implications for the risk profiles and financial stability of the respective banking institutions in responding to changing market conditions.

Table 3.
Descriptive Statistics

	ROA	NPL	SER	SVR	LR
Mean	0.008945	0.027232	6.220122	0.741215	6475.256
Median	0.009148	0.026317	6.080943	0.766932	80.27610
Maximum	0.182223	0.099410	18.07140	0.900745	416420.9
Minimum	-0.739864	0.000125	1.724925	0.399650	28.46297
Std. Dev.	0.071291	0.016527	2.799341	0.100466	44688.86

Source: Processed using **EViews 13.0**.

Individual Significance Test (t-Test)

The t-test was conducted to examine the partial significance of each independent variable on the dependent variable. The significance level (α) was set at 0.05. If the probability value (p-value) is less than 0.05, the null hypothesis (H_0) is rejected, indicating that the independent variable has a statistically significant individual effect on the dependent variable. Conversely, if the p-value exceeds 0.05, H_0 cannot be rejected, suggesting that the variable does not have a statistically significant effect. This approach enables a comprehensive assessment of which independent variables significantly explain variations in the dependent variable.

Effect of Non-Performing Loan on Return on Assets

The regression results indicate that the Non-Performing Loan (NPL) variable has a probability value of 0.0011, which is significantly below the 5% significance level. The regression coefficient of −0.009437 confirms that NPL has a significant negative effect on Return on Assets (ROA). This finding implies that an increase in the ratio of non-performing loans is associated with a decline in bank profitability, as higher credit risk requires larger loan loss provisions, thereby reducing earnings. These results are consistent with the findings of Ng et al. (2023), who reported that higher NPL ratios adversely affect the financial performance of Indonesian banks.

In contrast, Rama Ali et al. (2024) found a positive relationship between NPL and ROA among Indonesian state-owned banks. This discrepancy suggests that the impact of credit risk on profitability is not uniform across banking institutions. Differences in risk mitigation practices, government intervention, and borrower characteristics may explain the variation in findings. Therefore, the

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effectiveness of credit risk management and institutional factors plays a crucial role in determining whether NPL serves as a constraint on bank performance or merely reflects operational risk.

Effect of Shareholder Equity Ratio on Return on Assets

The partial regression analysis shows that the Shareholder Equity Ratio (SER) has a probability value of 0.1971, which exceeds the 5% significance level. Therefore, SER does not have a statistically significant effect on Return on Assets (ROA) within the scope of this study. This finding indicates that variations in the proportion of shareholders' equity are not a primary determinant of profitability among the sampled banks.

This result differs from the findings of Almanaseer (2024) and Arhinful, Amin, et al. (2025), who reported that stronger equity capitalization enhances profitability. Likewise, the present finding does not support the conclusion of Coleman (2023), who found that a greater reliance on equity negatively affects financial performance. The absence of a significant relationship suggests that the association between capital structure and profitability is context-dependent. External factors, including market penetration, dividend policy, and managerial flexibility in responding to economic conditions, may have a greater influence on ROA than the composition of equity capital alone.

Effect of Solvency Ratio on Return on Assets

The regression analysis confirms that the Solvency Ratio (SVR) has a statistically significant effect on profitability, with a probability value of 0.0003, which is well below the 5% significance level. The regression coefficient of −0.010040 indicates a significant negative relationship, implying that an increase in the solvency ratio reduces Return on Assets (ROA). Theoretically, this finding suggests that greater reliance on long-term liabilities may reduce financial performance due to higher interest expenses and increased leverage-related risks. These findings are consistent with Rossela et al. (2024), who also reported a negative relationship between solvency and bank profitability.

However, this result contrasts with the findings of Bui et al. (2023) and Hor and Lim (2025), who concluded that higher solvency improves profitability. The inconsistency among these studies indicates that the contribution of debt financing to profitability depends on the efficiency of capital allocation and prevailing macroeconomic conditions. Differences in risk management strategies and funding cost structures across banking institutions may explain why solvency does not consistently produce positive effects on financial performance.

Effect of Liquidity on Return on Assets

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The empirical results demonstrate that Liquidity, proxied by the Loan Ratio (LR), has a statistically significant effect on bank profitability. This is evidenced by a probability value of 0.0061, which is below the 0.05 significance level. The positive regression coefficient of 0.117416 indicates that higher lending activity is associated with higher Return on Assets (ROA). Operationally, this finding suggests that banks' ability to transform deposits into productive loans serves as an important driver of profitability.

These findings support the conclusions of Haris et al. (2024) and Nam and Tuyen (2024), who argued that effective and well-managed liquidity contributes positively to banks' financial performance. Nevertheless, Eltweri et al. (2024) emphasized that the relationship is not unconditional, as excessive liquidity may negatively affect profitability if not supported by sound risk management practices. These differing findings suggest that the optimal level of liquidity depends on operational strategies and macroeconomic conditions, requiring banks to balance profit maximization with the maintenance of adequate liquidity and financial stability.

Table 4.
Regression t-Test Results

Independent Variables	Dependent Variable		
	Return on Asset		
	Coefficient	Probability	Conclusion
Constant	-0.077337	-	-
NPL	-0.009437	0.0011	Significantly Negative
SER	0.005544	0.1971	Not Significant
SVR	-0.010040	0.0003	Significantly Negative
LR	0.117416	0.0061	Significantly Positive

Source: Processed Data (2025)

CONCLUSION

Based on the findings of this study, several practical implications can be drawn for financial managers and investors in supporting business decision-making.

a. Implications for Financial Managers

The findings provide a practical framework for financial managers in formulating strategic policies to enhance profitability. Given the significant negative effects of Non-Performing Loan (NPL) and Solvency Ratio (SVR) on Return on Assets (ROA), bank management should strengthen credit monitoring

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mechanisms and improve the efficiency of long-term debt management to prevent financing costs from reducing profitability. Conversely, the positive effect of the Liquidity Ratio (LR) suggests that banks should optimize the allocation of third-party funds into productive lending activities through well-managed expansion strategies. Although the Shareholder Equity Ratio (SER) does not exhibit a significant direct effect on ROA in this study, maintaining a strong capital structure remains essential for mitigating systemic risk and sustaining stakeholder confidence over the long term.

b. Implications for Investors

For investors, the findings serve as a useful reference for portfolio selection within the banking sector. Investment decisions should prioritize banks with strong credit risk management, as reflected by low Non-Performing Loan (NPL) ratios, since these are important indicators of sustainable profitability. Investors should also exercise caution when evaluating banks with excessively high Solvency Ratios (SVR), as excessive leverage may increase financial burdens and hinder asset growth. In contrast, banks that demonstrate effective liquidity management, as indicated by a positive Liquidity Ratio (LR), are more likely to provide stable profitability and dividend prospects. Although the Shareholder Equity Ratio (SER) was not found to have a significant direct impact on ROA, it remains an important indicator of capital strength and financial resilience, helping protect investors from extreme market volatility.

Recommendations

This study has several limitations that should be considered when interpreting its findings. First, the explanatory power of the model is limited to four fundamental variables, namely Non-Performing Loan (NPL), Shareholder Equity Ratio (SER), Solvency Ratio (SVR), and Liquidity Ratio (LR). Consequently, other relevant internal and external factors may also influence bank profitability but were not incorporated into the empirical model. Second, the study is limited by the observation period, sample size, and reliance on secondary data, making the findings context-specific. Therefore, caution should be exercised when generalizing the results to a broader banking industry or different economic environments.

Based on these limitations, several recommendations are proposed for future research. Future studies are encouraged to extend the observation period using longitudinal data and conduct comparative analyses across different categories of banks to obtain a more comprehensive understanding of the determinants of bank profitability. For banking practitioners, greater emphasis should be placed on reducing Non-Performing Loans (NPL), improving the

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efficiency of the Solvency Ratio (SVR), and optimizing the Liquidity Ratio (LR), as these variables have been shown to be significant determinants of profitability.

Furthermore, future research should incorporate additional microeconomic and macroeconomic variables, such as the Capital Adequacy Ratio (CAR), Operating Expenses to Operating Income (BOPO), Net Interest Margin (NIM), and bank size, to provide a more comprehensive analytical framework. Including these additional variables is expected to reduce omitted variable bias and offer a more holistic understanding of the factors influencing banking performance, thereby providing more reliable insights for financial managers, policymakers, and investors.

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