

The Impact of Credit Risk and Capital Adequacy on Profitability: The Mediating Role of Net Interest Margin

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Abstract

Bank profitability is essential for maintaining financial-sector stability and supporting sustainable economic intermediation. This study examines the effects of credit risk and capital adequacy on profitability and investigates the mediating role of net interest margin in conventional commercial banks listed on the Indonesia Stock Exchange during 2022–2024. A quantitative causal-associative design was employed using secondary financial data. The population consisted of 42 banks, from which 34 banks were selected through purposive sampling, producing 102 observations. Data were analyzed using path analysis with LISREL 10.20. The results show that Non-Performing Loans (NPL) significantly affect Return on Assets (ROA), whereas the Capital Adequacy Ratio (CAR) has no significant direct effect on ROA. NPL does not significantly affect Net Interest Margin (NIM), while CAR has a significant effect on NIM. Furthermore, NIM significantly and positively affects ROA. The mediation analysis indicates that NIM does not mediate the relationship between NPL and ROA but significantly mediates the relationship between CAR and ROA. These findings demonstrate that profitability is primarily associated with credit quality and intermediation performance, while capital adequacy contributes indirectly through its ability to strengthen net interest income generation and improve banking profitability. These results provide practical implications for effective bank financial management.

INTRODUCTION

In recent years, the financial sector has been dominated by the banking industry and financing institutions. Banking plays a very strategic role in driving the country's economy (Arthesa & Handiman, 2009). The role of banking in advancing a country's economy is enormous. Almost all sectors that carry out financial activities, whether individuals, institutions, social organisations, or companies, always need banking services. In carrying out their operational activities, banks must compete to maintain business continuity, so increasing profits becomes a very important aspect (Putrianingsih & Yulianto, 2016). According to the Financial Services Authority, banks perform their role by collecting funds from the public and then distributing credit to improve welfare. Banks must provide the best service to survive and generate maximum profits (OJK, 2024).

Although profitability is a crucial factor in the sustainability of banking businesses, Indonesia's position as one of the countries with the largest financial systems in the region is still below that of several ASEAN countries in terms of financial sector depth. Indonesia's ratio of banking assets to Gross Domestic Product (GDP) is only 59.5%, still lagging far behind Malaysia (198.6%), Thailand (146.6%), and Singapore (572.1%) (Victoria, 2022). This condition indicates that Indonesia's banking intermediation capacity remains suboptimal and could limit the scope for long-term profitability growth. The low depth of the financial sector

also confirms that increasing profitability is not only an operational necessity but also an important indicator in strengthening the competitiveness of the national banking sector so that it can keep pace with developments in the financial sector in the ASEAN region (Elena, 2023).

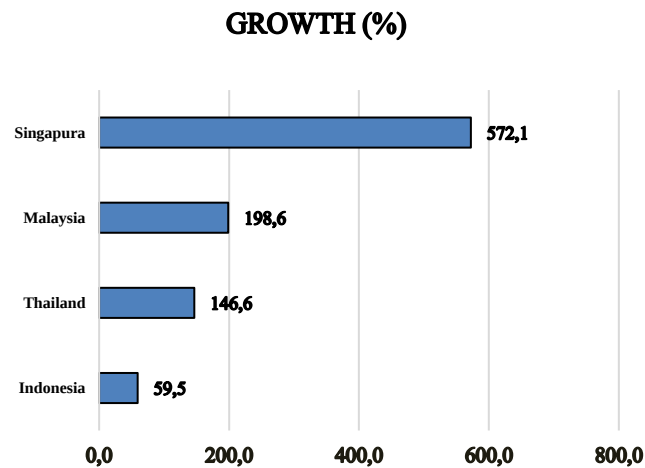


Figure 1. Ratio of banking assets to GDP

The lag in the depth of the financial sector is even more relevant when looking at the profitability trends of Indonesian banks, which have fluctuated in recent years. Annual data from the Financial Services Authority shows that the profitability ratio of Indonesian banks stood at 2.39% in 2022, increased to 2.74% in 2023, but declined again to 2.34% in 2024. This unstable pattern indicates that although Indonesia's profitability is relatively healthy, its performance is not guaranteed to be consistent (OJK, 2024). The year-to-year variability of the ratio indicates that banking profitability is highly sensitive to changes in economic conditions and industry structure, so it is necessary to consider several factors that affect profitability, including credit risk, capital adequacy, and net interest margin (Al Azizi & Martha, 2024). Return on Assets (ROA) is a metric used to assess the profitability of banking companies, as it is more representative of profitability (Pranowo et al., 2020).

Banks face credit risk when customers fail to repay their debts or loans upon maturity (Sudiyatno & Fatmawati, 2013). An increase in the credit risk ratio will reduce asset quality and decrease interest income, thereby negatively impacting profitability. Conversely, a low ratio indicates good credit risk management and contributes positively to an increase in the profitability ratio (Rusnaini et al., 2019). In this study, the financial ratio used to measure credit risk is Non-Performing Loan (Fitria & Sari, 2012). A higher NPL indicates a low quality of the financing distribution process carried out by the bank, while a lower NPL indicates a lower credit risk borne by the bank (Kasmir, 2016).

On the other hand, capital adequacy reflects a bank's financial strength in bearing the risk of loss. Banks with higher capital adequacy ratios tend to have more stable financial performance and a greater ability to absorb operational risk (Berger et al., 1995). The higher the ratio, the greater the bank's ability to withstand potential losses, which in turn can increase profits and improve financial performance (Astutiningsih & Baskara, 2019). An indicator often used to measure a bank's capital adequacy is the Capital Adequacy Ratio (Modigliani & Miller, 1959). CAR can be used to assess the adequacy of banks' capital in supporting risk-bearing

assets (Benny, 2014). This is because banks will be able to bear the risks of risky assets (Armelia, 2011).

In addition, net interest margin plays an important role in determining banks' profitability. This ratio measures the bank's management's ability to generate net interest income (Purnamasari & Renanda, 2022). The higher this ratio, the greater the interest income earned from productive assets managed by the bank, thereby reducing the likelihood of the bank experiencing problems (Rachmawati, 2014). Banks with high ratios tend to have high intermediation efficiency and can maintain profits even amid interest rate fluctuations and rising funding costs (Moudud-Ul-Huq et al., 2018; Phan et al., 2018; Simoens & Vennet, 2019). Therefore, net interest margin is highly relevant as a mediating variable that explains how credit risk and capital adequacy affect profitability through the interest spread-setting mechanism (Ho & Saunders, 1981).

Various studies on the effect of internal bank factors on Profitability show mixed results. Some studies find that NPL has a significant effect on ROA (Assegaff et al., 2026). However, others, such as Kalkan, (2025) and Sondakh et al. (2021), conclude that NPL actually has a significant negative effect on ROA. Inconsistent results are also seen in the capital adequacy variable, where Research by Butola et al. (2022) and Caka et al. (2025) shows that CAR has a significant positive effect on ROA, while Diansari et al. (2025) and Wibowo et al. (2019) find that CAR has no effect or a negative effect on ROA. These differing findings indicate a Research gap in the direct relationship between NPL and CAR on ROA. Therefore, it is important to consider indirect mechanisms that may explain these variations in results, one of which is Net Interest Margin (NIM) as a potential mediating variable that bridges the effects of credit risk and capital adequacy on a bank's ability to generate profits.

Previous studies on the effects of NPL and CAR on NIM have yielded mixed results. (Syahru, 2006) concluded that NPL has a significant effect on NIM, while Nugrahaning & Wahyudi, (2016) found that NPL has a significant negative effect on NIM. Meanwhile, Research by Astohar et al. (2019) and Ferly et al. (2023) found that CAR has a positive effect on NIM, whereas Research by Puspitasari et al. (2021) found no effect, further complicating the relationship between the variables. On the other hand, Research by Nguyen & Vu, (2025) and Nurwulandari et al. (2022) concluded that NIM has a positive effect on ROA. However, Sudarmawanti & Pramono, (2017) found that NIM has no significant effect on ROA. The inconsistency of the relationship in the path of Influence of NPL on NIM, the Influence of CAR on NIM, and the Influence of NIM on ROA, as well as the relevance of NIM in the bank's income structure, makes the placement of NIM as a mediating variable an important novelty that is worth re-testing in the Indonesian banking conditions of 2022-2024.

To reinforce the scientific contribution, this study offers novelty by selecting a more specific object, namely, conventional banks, unlike many previous studies that often combine conventional and Islamic banks in a single analysis model. This focus provides methodological advantages because conventional banks exhibit more homogeneous risk characteristics, intermediation patterns, interest structures, and net interest margin formation, yielding more precise and representative findings. The novelty of this study is also reinforced by the use of Net Interest Margin as a mediating variable, which has not been comprehensively explored in the context of conventional banking in Indonesia.

Given the diversity of empirical findings and the structural dynamics faced by the

banking sector in recent years, the urgency of this Research has become increasingly apparent. This is inseparable from the strategic role of the banking sector as a key pillar of national economic stability. Banks not only function as intermediary institutions, but also serve as important instruments in maintaining exchange rate stability, the effectiveness of monetary policy transmission, and contributing to the formation of Gross Domestic Product (GDP). However, the dominance of banks is accompanied by serious challenges, including an increase in non-performing loans, the risk of asset quality deterioration, liquidations, and bank acquisitions driven by capital and efficiency pressures. This condition emphasises the importance of Research that examines the fundamental factors that determine bank profitability, particularly Credit Risk, Capital Adequacy, and Net Interest Margin, which have previously been identified as strategic components in maintaining financial performance and the sustainability of the banking industry. Based on this, this study aims to analyse the effect of Credit Risk and Capital Adequacy on Profitability and to examine the mediating role of Net Interest Margin in strengthening the relationship between these variables in conventional banks in Indonesia from 2022 to 2024.

Signaling Theory

Signaling theory was developed by Spence, (1973) in his work Job Market Signaling, stating that companies with better information about their own performance will be encouraged to convey this information to parties outside the company. According to Brigham & Houston, (2014), a signal is an action taken by a company to give external parties an indication of how management views the company's prospects. These signals take the form of information about what management has done to realize the owners' wishes. According to Sudana & Sallama, (2015), signaling theory holds that companies that can generate profits tend to increase their debt. Highly profitable banks, with strong fundamentals, are a positive signal of the bank's health.

The Effect of Credit Risk on Profitability

Credit risk generally arises from non-performing loans (NPLs) (Puspitasari, 2014). High levels of credit risk can cause serious problems for bank management, as there is no recovery of the bank's main assets; if credit risk increases, profitability will decline (Million et al., 2015). Research conducted by Ambarawati & Abundanti, (2018), Choerudin et al. (2016), and Puspitasari, (2014) concluded that NPL has a significant effect on ROA. This means that if NPL increases, it will cause the bank's ROA to decline, so that the first hypothesis (H1) in this study can be formulated as follows:

H1: Credit risk has a significant effect on profitability.

The Effect of Capital Adequacy on Profitability

Capital adequacy describes a bank's ability to maintain sufficient capital to cover potential losses arising from investing funds in risky productive assets, as well as for financing fixed assets and investments Lukitasari & Kartika, (2014). The higher the CAR, the better the company's credit performance, as the funds available to cover bad debts are also greater (Veithza et al., 2013). Investors and companies will reap increased profits if the return on debt used to increase operating profits exceeds the interest that must be paid (Wardiah, 2013). Previous studies examining the relationship between capital adequacy and profitability conducted by Abiola & Olausi, (2014), Francis, (2013), and Primadewi & Suputra, (2015) show that capital adequacy has a positive effect on profitability. Based on this explanation, the

second hypothesis (H2) in this study can be formulated as follows:

H2: Capital adequacy has a significant effect on profitability.

The Effect of Credit Risk on Net Interest Margin

Non-Performing Loan (NPL) is one of the measurement tools that comprise the productive asset quality ratio (Sudarmawanti & Pramono, 2017). The NPL ratio shows the level of non-performing loans owned by banks. If banks' NPL levels are high, this condition will reduce banks' interest income (Nugrahaning & Wahyudi, 2016). Research by Ghosh et al. (2001), Peria & Mody, (2003), and Sidabalok & Viverita, (2010) found that NPL positively affects Net Interest Margin. This indicates that an increase in NPL can reduce a bank's net interest income, so that the third hypothesis (H3) of this study can be formulated as follows:

H3: Credit risk has a significant effect on net interest margin.

The Effect of Capital Adequacy on Net Interest Margin

Capital Adequacy Ratio (CAR) is a ratio that shows the extent to which all of a bank's risk-bearing assets (loans, securities investments, receivables from other banks) are financed from the bank's own capital funds in addition to funds obtained from sources outside the bank, such as public funds, loans (debt), and others (Wardiantika & Kusumaningtias, 2014). The higher the CAR, the better the bank's ability to bear the risk of each credit/productive asset, weighted for risk (Rahmani, 2017). This is supported by Research by Khanh & Tra, (2015), Nasserinia et al. (2015), and Purba & Triaryati, (2017), which states that CAR has a positive effect on NIM, so that the fourth hypothesis (H4) of this study can be formulated as follows:

H4: Capital adequacy has a significant effect on net interest margin.

The Effect of Net Interest Margin on Profitability

Interest income from productive assets controlled by banks will increase when NIM is higher, thereby lowering the percentage of banks declared to be in trouble (Pandia, 2012). A higher NIM will lead to higher banking company profits, so it can be said that NIM affects ROA in banking companies (Widyastuti & Aini, 2021). A bank's profits will increase if its NIM changes significantly. This means that the bank's financial performance will improve (Sinung et al., 2016). Previous studies conducted by Bilal et al. (2013), Christiano et al. (2014), and Purwoko & Sudiyatno, (2013) show that NIM has a significant effect on ROA. This means that the greater the net interest income (NIM), the greater the profit obtained, so that the fifth hypothesis (H5) of this study can be formulated as follows:

H5: Net interest margin has a significant effect on profitability.

The Effect of Credit Risk on Profitability through Net Interest Margin

Banks with high NIMs indicate higher profit margins from their credit collection and distribution activities (Haryanto et al., 2021). Excessively high NPL rates can reduce banks' profitability (Fahmi, 2016). Previous studies by Ascarya & Yumanita, (2010) and Wibisono & Wahyuni, (2017) found that NIM can mediate the effect of NPL on ROA. This means that high NPLs lead to a large number of non-performing loans, thereby reducing interest income and affecting the profits generated, which also decline. From this description, the sixth hypothesis (H6) of this study can be formulated as follows:

H6: Credit risk has a significant effect on profitability through net interest margin.

The Effect of Capital Adequacy on Profitability through Net Interest Margin

CAR shows the extent to which the decline in bank assets can still be covered by available bank equity. The higher the CAR, the better the bank's condition (Sudarmawanti &

Pramono, 2017). The higher the NIM ratio, the greater the interest income from productive assets managed by the bank, thereby reducing the likelihood of problems and improving its performance (Almilia et al., 2005). Research on the effect of CAR on ROA mediated by NIM has been studied by Anindiansyah et al. (2020), who stated that NIM significantly mediates the effect of CAR on ROA, so that the seventh hypothesis (H7) for this study can be formulated as follows:

H7: Capital adequacy has a significant effect on profitability through net interest margin.

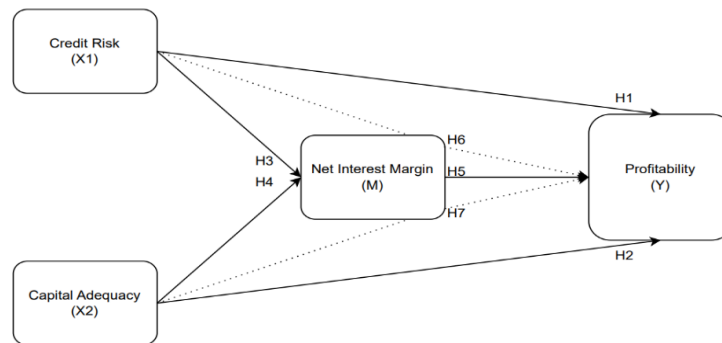


Figure 2. Conceptual Framework Model

METHOD

The Research method used in this study was quantitative Research. According to (Sugiyono, 2018), quantitative methods are based on the positivist philosophy and aim to describe and test hypotheses formulated by researchers. The Research design is an associative causal quantitative approach. Associative Research is intended to reveal causal relationships between two or more variables (Sugiyono, 2015). The data used in this study are secondary data, obtained from the literature in the form of books, opinions or thoughts of other parties, and articles from libraries and the internet. The data collected include NPL, CAR, NIM, and ROA for the 2022-2024 Research period. The following are the operational variables:

Tabel 1. Operational Variables

Variable	Measurement	Reference
Return on Asset (Y)	$ROA = \frac{\text{Earning Before Tax}}{\text{Total Assets}}$	Dewi, (2010)
Non-Performing Loan (X ₁)	$NPL = \frac{\text{Non-Performing Loan}}{\text{Total Loans}}$	Setiaji & Meiranto, (2015)
Capital Adequacy Ratio (X ₂)	$CAR = \frac{\text{Capital}}{\text{Risk-Weighted Assets}}$	Kasmir, (2019)
Net Interest Margin (M)	$NIM = \frac{\text{Net Interest Margin}}{\text{Earning assets}}$	Rokhim & Wulandary, (2013)

According to Sugiyono, (2018), the population is the area of generalization of objects that have certain qualities and characteristics, as determined by the researcher, to be studied, and from which conclusions are drawn. The population in this study comprises conventional commercial banks listed on the Indonesia Stock Exchange during 2022-2024, totaling 42 banks. The sampling technique used is purposive sampling, which involves selecting samples based on criteria relevant to the Research objectives. The sample criteria used are as follows:

Tabel 2. Purposive Sampling

No	Sample Criteria	Excluded	Included
1	Conventional commercial banks listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 period	-	42
2	Banks not under special regulatory supervision	2	40
3	Banks are publishing complete annual financial reports for the 2022–2024 period	-	40
4	Banks that did not incur losses during the 2022–2024 period	5	35
5	Banks reporting positive net interest income	1	34
	Final sample		34
	Total observations (34x3)		102

Source: Author observation

Based on the established purposive sampling criteria, 34 conventional commercial banks that met all requirements were selected as the Research sample.

The analysis model used was a path analysis in LISREL 10.20. Path analysis is a method for examining the direct and indirect effects of a set of exogenous variables on a set of endogenous variables. Through this path analysis, each variable can be identified, and the structure of the effects of these variables can be diagrammatically represented through a path diagram. According to the LISREL format, model suitability testing is conducted using the Goodness-of-Fit-Test (GFT), while individual testing is conducted using the t-test statistic (Kusnendi, 2008). The path analysis model in this study is formulated as follows:

$$ROA_{it} = \beta_0 + \beta_1 (NIM)_{it} + \beta_2 (NPL)_{it} + \beta_3 (CAR)_{it} + \varepsilon_{it} \dots (1)$$

$$NIM_{it} = \alpha_0 + \alpha_1 (NPL)_{it} + \alpha_2 (CAR)_{it} + \mu_{it} \dots (2)$$

Note:

ROA : Return on Assets

NIM : Net Interest Margin

NPL : Non-Performing Loan

CAR : Capital Adequacy Ratio

i : Bank *i*

t : Time Period (2022–2024)

ε_{it} μ_{it} : Error terms

RESULTS AND DISCUSSION

Path Analysis Results

Based on the formulated analysis model, the relationships among the variables in this study are further visualized in a path diagram. Path diagrams are used to systematically describe the direction and magnitude of direct and indirect effects among the exogenous and endogenous variables under analysis. In this study, Non-Performing Loans (NPL) and Capital Adequacy Ratio (CAR) act as exogenous variables, Net Interest Margin (NIM) as a mediating variable, and Return on Assets (ROA) as the main endogenous variable. This path diagram was compiled from parameter estimates obtained with LISREL 10.20, so that each displayed coefficient reflects the strength of the causal relationship between the variables in the Research model.

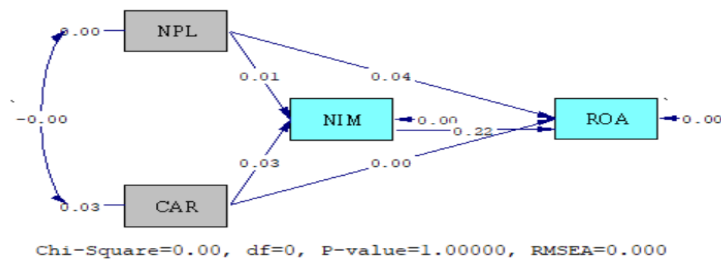


Figure 3. Parameter Estimation
Source: Data Processing Result

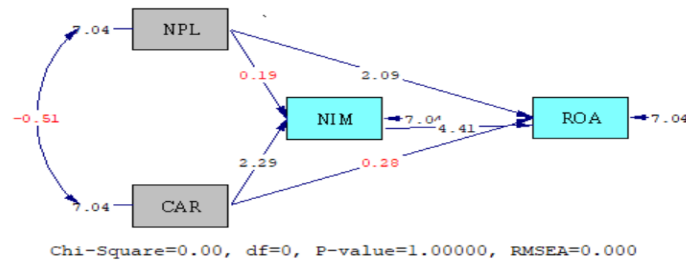


Figure 4. T-Statistic Value
Source: Data Processing Result

Hypothesis Testing

Based on the path analysis model estimates shown in the previous diagram, the next step is to decompose the effects and test the hypotheses to determine the direction, magnitude, and significance of the relationships among the variables in the Research model. A summary of the hypothesis-testing results, including parameter estimates, coefficient of determination values, and conclusions on the acceptance or rejection of hypotheses, is presented systematically in the following table.

Tabel. 3 Hypothesis Test Decomposition

Hypothesis	Influence of Variables	Parameter Estimation	T-Count	T-Table	Conclusion
H ₁	NPL → ROA	0.04	2.09	1.98	Significant
H ₂	CAR → ROA	0.001	0.28	1.98	Not Significant
H ₃	NPL → NIM	0.01	0.19	1.98	Not Significant
H ₄	CAR → NIM	0.03	2.29	1.98	Significant
H ₅	NIM → ROA	0.22	4.41	1.98	Significant
H ₆	NPL → NIM → ROA	0.00	0.19	1.98	Not Significant
H ₇	CAR → NIM → ROA	0.01	2.03	1.98	Significant

Source: Data Processing Result

Based on the results of the hypothesis test decomposition presented in the table, four of the seven proposed hypotheses were accepted, and three were rejected. The test was conducted by comparing the t-count value with the t-table value of 1.98 at the 5% significance level.

- Hypothesis 1, which tests the effect of Non-Performing Loans (NPL) on Return on Assets (ROA), shows a coefficient value of 0.04. The positive direction of the relationship indicates that a 0.04% increase follows a 1% increase in credit risk in Profitability. The t-value = 2.09 (> 1.98) indicates a significant effect of credit risk on Profitability. This means that H0 is rejected.
- Hypothesis 2, which tests the effect of Capital Adequacy Ratio (CAR) on Return on Assets (ROA), shows a coefficient value of 0.017. The positive direction of the relationship indicates that if Capital Adequacy increases by 1%, Profitability will increase by 0.017%. The t-value = 0.28 (< 1.98), so the effect of Capital Adequacy on Profitability is not significant. This means that H0 is accepted.
- Hypothesis 3, which tests the effect of NPL on Net Interest Margin (NIM), shows a coefficient value of 0.0074. The positive direction of the relationship indicates that if Credit Risk increases by 1%, Net Interest Margin will increase by 0.0074%. The t-value = 0.19 (< 1.98), indicating an insignificant effect of Credit Risk on Net Interest Margin. This means that H0 is accepted.
- Hypothesis 4, which tests the effect of CAR on NIM, shows a coefficient value of 0.08. The positive direction of the relationship indicates that if Capital Adequacy increases by 1%, Net Interest Margin will increase by 0.08%. The t-value = 2.29 (> 1.98), so the effect of Capital Adequacy on Net Interest Margin is significant. This means that H0 is rejected.
- Hypothesis 5, which tests the effect of NIM on ROA, shows a coefficient value of 0.22. The positive direction of the relationship indicates that if the net interest margin increases by 1%, it will be followed by an increase in Profitability of 0.22%. The t-value = 4.41 (> 1.98), indicating that the net interest margin has a significant effect on Profitability. This means that H0 is rejected.
- Hypothesis 6 shows that the effect of the Credit Risk variable on Profitability through Net Interest Margin has an indirect path coefficient of 0.0016 and a t-value of 0.19. This value is smaller than 1.98. This result indicates that Net Interest Margin has an insignificant effect on mediating Credit Risk and Profitability, so H0 is accepted.
- Hypothesis 7 shows that the effect of the Capital Adequacy variable on Profitability through Net Interest Margin shows an indirect path coefficient value of 0.017 with a t value of 2.03. This value is greater than 1.98. This result indicates that Net Interest Margin has a significant effect on mediating Capital Adequacy and Profitability, so H0 is rejected.

Coefficient of Determination

According to the conceptual model used in this study, there are two structural equations. These equations quantitatively describe the magnitude of the direct Influence of each independent variable on the dependent variable, as well as the model's ability to explain the variation in endogenous variables as indicated by the coefficient of determination (R^2). The first structural equation involves endogenous variables in the form of Profitability and several exogenous variables, namely credit risk (NPL), capital adequacy (CAR), and net interest margin (NIM). The following are the results of the first structural equation:

$$ROA = 0.22*NIM + 0.040*NPL + 0.0017*CAR, \text{ Errorvar.} = 0.00012, R^2 = 0.21$$

(0.049) (0.019) (0.0060) (0.00)

4.41 2.09 0.28 7.04

The calculation shows that the R-squared value is 0.21. This indicates that 21% of the

variation in business value is attributable to credit risk, capital adequacy, and net interest margin. Given the existing structural coefficient values, these three variables contribute positively to increased Profitability. Furthermore, for the second structural equation, the endogenous variable considered is net interest margin (NIM), while the exogenous variables include credit risk (NPL) and capital adequacy (CAR). The following are the results of the structural equation:

$$\text{NIM} = 0.0074 \cdot \text{NPL} + 0.028 \cdot \text{CAR}, \text{Errorvar.} = 0.00050, R^2 = 0.050$$

(0.039) (0.012) (0.00)

0.19 2.29 7.04

An R^2 value of 0.050 indicates that the variables of credit risk and capital adequacy can explain 5.0% of the variation in Net Interest Margin. In comparison, the remaining 95.0% is influenced by other factors outside the Research model, such as interest rate conditions, operational efficiency, funding structure, and the level of banking competition. Although the model's explanatory power is relatively low, these results still provide empirical evidence of the importance of capital adequacy in determining the banking Net Interest Margin.

The Effect of Credit Risk on Profitability

The test results show that Non-Performing Loans (NPLs) have a significant effect on Return on Assets (ROA), thus supporting hypothesis H1. This finding reflects the actual financial performance of the sample banks, where a decline follows an increase in NPLs in Profitability. Empirically, high NPLs indicate a large proportion of problem loans, including substandard, doubtful, and loss loans, which prevent interest income from being recognised optimally because these loans are classified as non-accrual. This condition directly reduces net interest income, which is one of the components of bank profit. In addition, an increase in NPLs encourages banks to form provisions for impairment losses, which are recorded as operating expenses in the income statement, thereby putting significant pressure on pre-tax profits. Meanwhile, the bank's total assets did not experience a comparable decline because non-performing loans are still recorded as assets on the balance sheet. As a result, the decline in profit, as the numerator, and the high total assets, as the denominator, caused ROA to decline. Thus, the results of this test show that NPLs play an important role in determining bank Profitability through the mechanism of asset quality decline and increased provisioning expenses. The findings of this study align with those of Ambarawati & Abundanti, (2018), Choerudin et al. (2016), and Puspitasari, (2014), who concluded that NPLs have a significant effect on ROA.

The Effect of Adequacy on Profitability

The test results show that the Capital Adequacy Ratio (CAR) has no significant effect on Return on Assets (ROA), so hypothesis H2 is rejected. This finding shows that a bank's capital adequacy level does not necessarily directly increase Profitability. Empirically, based on the financial statements of sample banks for the 2022–2024 period, a high CAR reflects a bank's ability to absorb risk of loss rather than as a source of profit. Large core capital is generally invested in low-risk assets, such as securities or current accounts at Bank Indonesia, which yield relatively small returns. In addition, some banks with high CARs actually show conservative credit expansion, so that potential interest income is not optimal. As a result, even though banks have strong capital levels, net profit does not increase significantly, so it is unable to drive an increase in ROA. These findings align with several studies by Diansari et al. (2025)

and Wibowo et al. (2019), which indicate that CAR does not affect Profitability because its main role is to maintain capital stability. However, studies by Butola et al. (2022) and Caka et al. (2025) find a significant effect of CAR on ROA, and this difference can be explained by differences in capital utilisation strategies across banks.

The Effect of Credit Risk on Net Interest Margin

The test results show that Non-Performing Loans (NPLs) have no significant effect on Net Interest Margin (NIM), so hypothesis H3 is rejected. Based on the financial statement tabulation, although several banks experienced an increase in NPL, the NIM remained relatively stable. This indicates that banks can maintain their interest margins by adjusting lending rates, repricing productive assets, and efficiently managing third-party funds. In other words, the increase in non-performing loans does not directly reduce the interest margin because banks still earn interest income from performing loans and other productive instruments. In addition, the impact of NPLs is primarily reflected in increased provisioning expenses rather than a decrease in interest margins. Therefore, NPLs have no significant direct effect on NIM. The results of this study are consistent with those of the previous study by Nugrahaning & Wahyudi, (2016), which found that NPLs have a significant negative effect on NIM. Meanwhile, Research by Syahru, (2006) found that NPLs affect NIM, showing different findings. This difference can be explained by the fact that banks during the Research period had strong risk management capabilities, thereby minimizing the impact of NPLs on NIM.

The Effect of Capital Adequacy on Net Interest Margin

The test results indicate that the Capital Adequacy Ratio (CAR) has a significant effect on the Net Interest Margin (NIM), thereby supporting hypothesis H4. This finding indicates that strong capital adequacy allows banks to expand credit more aggressively and selectively in sectors with higher returns. Based on financial reports, banks with higher CARs have greater flexibility in disbursing productive loans without capital risk pressure, thereby increasing net interest income. In addition, strong capital increases market confidence and reduces the cost of funds, which ultimately widens the gap between interest income and interest expenses. This condition explains why CAR plays a significant role in increasing NIM. These results are consistent with several previous studies by Khanh & Tra, (2015), Nasserinia et al. (2015), and Purba & Triaryati, (2017), which indicate that CAR has a positive effect on NIM, with capital supporting interest income and NIM stability.

The Effect of Net Interest Margin on Profitability

The test results indicate that Net Interest Margin (NIM) has a significant effect on Return on Assets (ROA), thereby supporting hypothesis H5. This finding confirms that NIM is the most dominant factor in determining bank Profitability. Based on the income statement, net interest income is the main contributor to bank operating profit. An increase in NIM reflects the bank's efficiency in managing productive assets and third-party funds, enabling it to generate higher interest income than it incurs in interest expenses. When NIM increases, pre-tax profit rises proportionally, while total assets remain relatively stable, thereby increasing ROA. NIM is a dominant factor in determining bank Profitability because interest income is the main source of bank revenue. Therefore, NIM is the main channel through which intermediation performance is transmitted to bank Profitability. The results of this study are consistent with several previous studies by Bilal et al. (2013), Christiano et al. (2014), and Purwoko & Sudiyatno, (2013), which show that NIM has a significant effect on ROA.

The Effect of Credit Risk on Profitability through Net Interest Margin

The test results show that NIM is unable to mediate the effect of NPL on ROA, thus rejecting hypothesis H6. Empirically, the impact of NPL on ROA is more dominant through a direct channel in the form of increased provisioning and decreased profits, rather than through a decrease in interest margin. Based on financial reports, even though NPLs increased, banks were still able to maintain NIM through interest rate management and funding structure. However, the increase in impairment losses due to NPLs still directly depressed net profit. Therefore, NIM does not act as an intermediary mechanism in the relationship between NPLs and ROA. These results differ from several studies by Ascarya & Yumanita, (2010) and Wibisono & Wahyuni, (2017), which found that credit risk can affect Profitability through the interest income channel.

The Effect of Capital Adequacy on Profitability through Net Interest Margin

The test results show that NIM mediates the effect of the Capital Adequacy Ratio (CAR) on Return on Assets (ROA), thereby accepting hypothesis H7. This finding indicates that the effect of CAR on Profitability is not direct, but rather through an increase in bank intermediation performance. Based on financial reports, banks with high CARs can allocate credit more efficiently and reduce funding costs, thereby increasing NIM. The increase in NIM then affects operating profit and net profit, ultimately increasing ROA. Thus, NIM serves as a transmission channel linking capital adequacy to bank Profitability. This finding aligns with the Research by Anindiansyah et al. (2020), which found that NIM significantly mediates the effect of CAR on ROA.

CONCLUSION

This study aimed to examine the effects of Non-Performing Loans (NPL) and Capital Adequacy Ratio (CAR) on Return on Assets (ROA), with Net Interest Margin (NIM) serving as a mediating variable in conventional commercial banks listed on the Indonesia Stock Exchange during the 2022–2024 period. The results indicate that NPL has a significant effect on ROA, demonstrating that credit risk remains an important determinant of bank profitability. In contrast, CAR does not have a significant direct effect on ROA, suggesting that a higher level of capital adequacy alone does not necessarily improve profitability. The findings also reveal that NIM has a significant positive effect on ROA, indicating that the effectiveness of banks in generating interest income from productive assets plays a crucial role in enhancing financial performance. Furthermore, CAR is found to have a significant effect on NIM, whereas NPL does not significantly influence NIM. These results suggest that adequate capital supports the bank's intermediation function and contributes to the generation of interest margins, while changes in credit risk do not directly affect the bank's ability to generate interest income. The mediation analysis further shows that NIM successfully mediates the relationship between CAR and ROA, indicating that the impact of capital adequacy on profitability occurs indirectly through improved intermediation performance. However, NIM does not mediate the relationship between NPL and ROA, implying that the effect of credit risk on profitability occurs directly rather than through changes in interest margins. Overall, the study concludes that bank profitability is primarily driven by credit quality and intermediation performance. While capital adequacy does not directly increase profitability, it contributes indirectly by strengthening the bank's ability to generate net interest income. These findings highlight the

importance of effective credit risk management and efficient intermediation activities in sustaining and improving bank profitability.

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