

The Role of Firm Size as a Moderating Variable in the Relationship Between Net Interest Margin, Liquidity, and Solvency on Profitability

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Abstract

This study was conducted to examine the effect of Net Interest Margin (NIM), liquidity, and solvency on the level of profitability of conventional commercial banks listed on the Indonesia Stock Exchange (IDX) during the period 2022–2024. In addition, this research aims to assess the role of firm size as a moderating variable in the relationship between these three financial variables and profitability. The sample was selected using a purposive sampling technique, resulting in 36 banks that met the research criteria. The analytical method employed a quantitative approach, utilizing SmartPLS version 4 to process the data and test the structural model. The results indicate that Net Interest Margin has a positive and statistically significant effect on profitability. Liquidity shows a positive but statistically insignificant effect, while solvency exhibits a negative and statistically insignificant influence on profitability. Firm size, as a moderating variable in the relationship between Net Interest Margin and profitability, demonstrates a negative but insignificant moderating effect. Similarly, in the relationships between liquidity and profitability as well as solvency and profitability, firm size shows a positive but insignificant moderating role. These findings suggest that although firm size may reflect operational strength and financial stability, it does not necessarily strengthen the impact of financial variables on profitability. This study contributes to the banking sector by emphasizing the importance of efficient Net Interest Margin management as a primary determinant of profitability.

Keywords : Net Interest Margin, Liquidity, Solvency, Profitability, Firm Size

I. Introduction

The current condition of the Indonesian economy inevitably affects corporate profitability. Companies undertake various strategic efforts to achieve higher levels of profitability, as the ability to generate substantial profits can attract investors to allocate their capital. Increased investor interest subsequently raises demand for the company's shares, which positively influences corporate sustainability and firm value. Conversely, when profits decline, investors may hesitate to invest or may even withdraw their funds, ultimately reducing the company's value and long-term viability (Aci et al., 2021). Corporate growth is often unstable; a company may experience profit increases in one year and declines in the following year. Several factors influence profitability, including capital structure, sales growth, firm size, Net Interest Margin (NIM), liquidity, and solvency.

Within a country's financial system, the banking sector serves as a fundamental pillar with a strategic role in driving overall economic activity. Banks perform essential functions such as credit distribution, mobilization of public funds, and provision of various financial services. One of the key indicators considered by banks in improving profitability is Net Interest Margin. NIM is a performance measure that reflects the professionalism and effectiveness of bank management in generating net interest income. This ratio is used to assess a bank's ability to manage its earning assets in order to obtain net interest income. A higher Net Interest Margin indicates greater potential for profit generation (Frianto, 2012).

Liquidity is another important factor influencing bank profitability. Liquidity refers to a ratio that indicates a company's ability to meet its short-term obligations in a timely manner (Taswan, 2006). Adequate liquidity ensures operational stability; however, excessive liquidity may reduce earning opportunities.

Solvency also plays a significant role in determining profitability, either positively or negatively. One of the primary indicators used to measure bank solvency is the Capital Adequacy Ratio (CAR), which represents the bank's capital strength in absorbing potential losses arising from its business activities (Kasmir, 2019). A strong solvency position enhances financial resilience and may support profitability, although excessive capital holdings may limit return optimization.

Table I. LDR, CAR, NIM, and ROA Values for the Period 2022–2024

No	Stock Code	Company Name	Year	ROA	LDR	CAR	NIM
1	BABP	Bank MNC Internasional	2022	1.04	76.96	23.62	4.95
			2023	0.71	75.68	31.00	4.15
			2024	0.50	77.57	24.53	3.30
2	BBHI	Allo Bank Indonesia Tbk	2022	3.55	163.19	79.53	6.70
			2023	4.76	150.77	83.35	9.01
			2024	4.48	122.69	82.58	8.88
3	BCIC	Bank JTrust Indonesia Tbk	2022	0.17	76.11	14.86	2.77
			2023	0.06	74.61	14.04	2.67
			2024	0.26	78.25	13.89	2.30

Source: Annual Reports of companies listed on the Indonesia Stock Exchange (2022–2024)

Based on the table above, the Return on Assets (ROA) of Bank MNC Internasional shows a consistent decline over the three-year period, decreasing from 1.04% to 0.50%. Meanwhile, the ROA of Allo Bank Indonesia fluctuated, increasing from 3.55% to 4.76% and then slightly declining to 4.48%. Similarly, Bank JTrust Indonesia experienced fluctuations in ROA, recording 0.17%, 0.06%, and 0.26% over the respective years.

In terms of Net Interest Margin (NIM), issuers BABP and BCIC exhibited a declining trend, whereas BBHI showed an increase. However, despite the increase in NIM, ROA still demonstrated fluctuations, indicating that higher NIM does not automatically guarantee stable profitability.

Regarding liquidity, measured by the Loan to Deposit Ratio (LDR), BABP and BCIC maintained ratios within the range of 70% to 80%, suggesting relatively balanced liquidity management. In contrast, BBHI recorded LDR levels above 120%, reflecting a more aggressive lending strategy.

For solvency, proxied by the Capital Adequacy Ratio (CAR), BABP maintained CAR levels between 20% and 30%, BBHI recorded a significantly high CAR of around 80%, while BCIC maintained CAR levels of approximately 14%. These variations indicate differences in capital strength and risk management strategies among the banks. Overall, numerous factors may influence profitability, including interest margin efficiency, liquidity management, and capital adequacy.

Companies categorized as large firms generally possess substantial total assets. Firm size serves as an indicator to measure the scale of a company's operations and reflects the magnitude of the business entity (Riyanto, 2013). Based on the background and the phenomena observed, this study is entitled: "The Moderating Role of Firm Size in the Relationship Between Net Interest Margin, Liquidity, and Solvency and Profitability."

2. Literature Review and Hypotheses Development

This study is grounded in the premise that profitability represents a key indicator of banking performance and sustainability. In the banking sector, profitability reflects the effectiveness of management in utilizing financial resources to generate earnings. As emphasized in the study, profitability in this research is measured using Return on Assets (ROA), which indicates management efficiency in managing total assets to produce net income.

2.1 Net Interest Margin and Profitability

Net Interest Margin (NIM) is a crucial indicator of banking performance, as it reflects the bank's ability to generate net interest income from its productive assets. According to Frianto (2012), NIM measures the effectiveness of bank management in creating a spread between interest income earned from lending activities and interest expenses paid on third-party funds. A higher NIM indicates more efficient asset–liability management and stronger intermediation performance. From a financial intermediation perspective, banks primarily earn income from interest-based activities. Therefore, an increase in NIM should directly enhance profitability, as greater spreads translate into higher net income. Empirical findings presented in the study also show that NIM has a positive and significant effect on profitability. Based on this theoretical and empirical foundation, the following hypothesis is formulated:

H1: Net Interest Margin has a positive and significant effect on profitability.

2.2 Liquidity and Profitability

Liquidity reflects a bank's ability to meet its short-term obligations. Taswan (2006) explains that liquidity ratios indicate whether a bank can fulfill its financial commitments in a timely manner. In banking research, liquidity is often proxied by the Loan to Deposit Ratio (LDR), which measures the proportion of loans extended relative to third-party funds. Theoretically, higher lending activities (reflected in LDR) may increase interest income and consequently profitability. However, excessive lending may also elevate credit risk, particularly when credit quality deteriorates and non-performing loans (NPLs) rise. Thus, while liquidity management can positively influence profitability, the relationship may not always be statistically significant, depending on risk exposure and operational efficiency. Accordingly, the second hypothesis is proposed:

H2: Liquidity has a positive effect on profitability.

2.3 Solvency and Profitability

Solvency refers to a bank's ability to absorb potential losses and sustain long-term financial stability. Kasmir (2019) states that the Capital Adequacy Ratio (CAR) is a primary indicator used to measure a bank's capital strength. A higher CAR indicates stronger capital resilience and risk-bearing capacity. From a prudential banking perspective, adequate capital enhances public confidence and reduces the likelihood of financial distress. However, excessively high capital levels may indicate inefficient capital allocation, as funds are retained as buffers rather than invested in productive activities. Consequently, the relationship between solvency and profitability may be either positive or negative, depending on how effectively capital is managed. Based on this reasoning, the following hypothesis is developed:

H3: Solvency has an effect on profitability.

2.4 The Moderating Role of Firm Size

Firm size reflects the scale of operations and organizational capacity. According to Riyanto (2013), firm size can be measured through total assets, which represent the magnitude of a business entity. Larger firms generally possess broader operational networks, diversified income sources, better access to funding, and stronger risk management systems. In the banking context, firm size may strengthen or weaken the relationship between financial indicators and profitability. Large banks often generate income not only from interest margins but also from fee-based services and other non-interest income streams. Therefore, the influence of NIM on profitability may differ between small and large banks. Similarly, liquidity and solvency management strategies may produce varying impacts depending on the bank's operational scale. Given that firm size can alter the direction and strength of financial relationships, it is positioned as a moderating variable in this study. Accordingly, the following hypotheses are formulated:

H4: Firm size moderates the relationship between Net Interest Margin and profitability.

H5: Firm size moderates the relationship between liquidity and profitability.

H6: Firm size moderates the relationship between solvency and profitability.

3. Method

This study employs a quantitative research approach, focusing on conventional commercial banks listed on the Indonesia Stock Exchange (IDX) during the period 2022–2024 that publish the required financial statements. The data utilized in this research are secondary data derived from the banks' annual financial reports. The total population consists of 41 banks, of which 36 banks were selected as the research sample using purposive sampling techniques, as they met the predetermined criteria. The primary focus of this study is to examine the moderating role of firm size in the relationship between Net Interest Margin, liquidity, and solvency on profitability. The data analysis was conducted using SmartPLS version 4, applying the Structural Equation Modeling (SEM) approach to evaluate both the measurement model and the structural model.

4. Result and Discussion

This study employed the Partial Least Squares (PLS) method, a multivariate statistical technique that enables the simultaneous analysis of relationships among multiple independent and dependent variables. PLS was selected due to its suitability for relatively small sample sizes, its non-reliance on normal data distribution assumptions, and its robustness in addressing multicollinearity issues. These advantages make PLS an appropriate analytical tool for testing the proposed structural model and answering the research questions effectively.

4.1 Effect of Net Interest Margin on Profitability

The findings reveal that Net Interest Margin (NIM) has a positive and statistically significant effect on profitability. This is evidenced by an original sample coefficient of 0.646 and a p-value of 0.000, which is below the 0.05 significance threshold. The positive coefficient indicates that higher NIM leads to higher profitability, as measured by Return on Assets (ROA).

This result suggests that the efficiency of interest intermediation plays a crucial role in enhancing bank performance. Banks that are able to generate a higher spread between interest income from loans and interest expenses on third-party funds demonstrate effective asset–liability management. Consequently, improved intermediation efficiency directly contributes to increased profitability. These findings reinforce the argument that NIM serves as a primary determinant of financial performance in the banking sector.

4.2 Effect of Liquidity on Profitability

The analysis shows that liquidity has a positive but statistically insignificant effect on profitability, with an original sample value of 0.090 and a p-value of 0.0542. Although the direction of the relationship is positive, it does not meet the required significance level.

Theoretically, higher loan disbursement should increase interest income and thus profitability. However, in practice, the impact appears inconsistent. High credit expansion does not automatically guarantee improved profitability, as it may be accompanied by increased credit risk, higher non-performing loans (NPLs), or elevated funding costs. This indicates that liquidity management alone is insufficient to drive profitability without strong credit quality control and effective risk management. Banks must therefore balance aggressive lending strategies with prudent liquidity risk management to ensure sustainable financial performance.

4.3 Effect of Solvency on Profitability

The results indicate that solvency has a negative but statistically insignificant effect on profitability, with an original sample coefficient of -0.266 and a p-value of 0.413. Although banks generally maintain Capital Adequacy Ratios (CAR) above the regulatory minimum, higher solvency does not significantly enhance profitability.

This finding implies that excess capital reserves may reduce efficiency in asset utilization. When banks hold substantial capital buffers, these funds may not be fully allocated to productive activities, thereby limiting potential returns. While strong solvency is essential for long-term financial stability and risk absorption, it does not automatically translate into higher profitability. Effective capital management strategies are therefore necessary to optimize returns while maintaining financial resilience.

4.4 Moderating Role of Firm Size in the Relationship Between Net Interest Margin and Profitability

The moderating effect of firm size on the relationship between NIM and profitability is negative and statistically insignificant, with a coefficient of -0.256 and a p-value of 0.074. This indicates that firm size does not significantly strengthen the positive effect of NIM on profitability.

Although larger banks typically benefit from broader operational capacity, diversified business portfolios, and better access to funding sources, the results suggest that the importance of NIM may diminish in larger institutions. This may be attributed to the increasing contribution of non-interest income, such as fee-based

income, which reduces reliance on interest margins. Additionally, large banks often face more complex cost structures and higher operational expenses, potentially weakening the direct impact of NIM on profitability.

4.5 Moderating Role of Firm Size in the Relationship Between Liquidity and Profitability

The findings show that firm size positively but insignificantly moderates the relationship between liquidity and profitability (coefficient = 0.118; p-value = 0.423). Although the direction is positive, the moderating effect is not statistically significant.

This suggests that in large-scale banks, liquidity does not serve as a dominant determinant of profitability. Larger institutions often adopt conservative liquidity policies to maintain financial stability, while simultaneously relying on diversified revenue streams. As a result, the influence of liquidity on profitability becomes less pronounced. This finding highlights that firm size does not substantially enhance the effectiveness of liquidity management in improving profitability.

4.6 Moderating Role of Firm Size in the Relationship Between Solvency and Profitability

The moderating effect of firm size on the relationship between solvency and profitability is positive but statistically insignificant, with a coefficient of 0.246 and a p-value of 0.379.

Although large banks typically possess stronger capital resilience, superior risk management systems, and broader access to financing, firm size does not significantly strengthen the impact of solvency on profitability. This implies that high capital adequacy in large banks does not automatically lead to higher returns. Instead, excessive capital may remain underutilized if not managed efficiently.

Overall, the findings demonstrate that while firm size reflects operational scale and financial strength, it does not significantly moderate the relationships between Net Interest Margin, liquidity, solvency, and profitability. Among the examined variables, Net Interest Margin emerges as the most influential determinant of profitability. These results underscore the importance of improving interest intermediation efficiency as a strategic priority for enhancing bank financial performance.

5. Conclusion

This study highlights the importance of a comprehensive understanding of internal factors influencing banking profitability. The dynamics between financial performance and firm characteristics indicate that not all variables play a consistent role across different organizational contexts, particularly when influenced by firm size. Therefore, in making strategic decisions, banking institutions must consider not only the strength of individual financial indicators but also how organizational characteristics such as firm size may modify the direction and magnitude of these relationships.

In this research, the analyzed variables include Net Interest Margin (NIM), liquidity, solvency, profitability, and firm size as a moderating variable. NIM reflects the effectiveness of banks in maximizing earning assets to generate net interest income, making it a crucial indicator in assessing financial intermediation performance. Liquidity represents the bank's capacity to meet short-term obligations, typically measured using the Loan to Deposit Ratio (LDR), which indicates the proportion of loans extended relative to third-party funds. Solvency, measured through the Capital Adequacy Ratio (CAR), demonstrates the bank's capital strength in absorbing potential losses. Profitability is proxied by Return on Assets (ROA), which measures management effectiveness in utilizing assets to generate earnings. Meanwhile, firm size functions as a moderating variable that may strengthen or weaken the relationship between financial variables and profitability, as operational scale can influence the effectiveness of financial strategies implemented by the institution.

The findings provide important implications for bank management and regulators in formulating policies that are more adaptive to organizational structure and scale. Large-scale banks should reassess the effectiveness of asset management and revenue strategies, while optimizing operational efficiency to maintain profitability. Moreover, risk management and capital allocation strategies must be implemented in a balanced manner to ensure not only financial resilience but also sustainable value creation. From a regulatory perspective, policymakers should promote transparency and efficiency within the banking industry by designing regulations that take into account institutional differences among banks.

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