Ilomata International Journal of Tax and Accounting

RECEIVED 21 February 2026
ACCEPTED 2 April 2026
PUBLISHED 30 April 2026

CITATION
Mawarni A, Mardiyani, (2026). Intermediation Efficiency and Bank Profitability: Evidence from Foreign Exchange Private Banks. Ilomata International Journal of Tax and Accounting. 7 (2), 1-9. doi: 10.61194/ijtc.v7i2.2175

TYPE Original Research
PUBLISHED 30 April 2026
DOI 10.61194/ijtc.v7i2.2175
VOL 7 Issue 2 April 2026

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Intermediation Efficiency and Bank Profitability: Evidence from Foreign Exchange Private Banks

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Abstract

The Banking sector holds a crucial role in safeguarding financial system stability while fostering economic growth through its intermediation function. However, banking profitability in Indonesia has fluctuated due to intense competition for funds, slower credit expansion, and rising operational cost pressures. This study analyzes the effects of Third Party Funds (TPF) and asset growth on bank profitability, proxied by ROA, and examines whether NIM mediates these relationships in private foreign exchange commercial banks. This study contributes by focusing on IDX-listed private foreign exchange banks during 2022-2024 and testing NIM as a mediatior between TPF, Asset Growth, and ROA using a unified path model. Empirical evidence focusing on this bank segment and recent observation period remains limited in the Indonesian banking profitability literature. This research adopts a quantitative approach, using secondary financial statement data for the 2022-2024 period, and selects samples purposively from 17 banks. Data were analyzed using path analysis with LISREL 8.8. The findings indicate that TPF and asset growth significantly affect ROA. TPF also significantly influences NIM, while asset growth does not. Moreover, NIM significantly affects ROA but fails to mediate the effects of TPF and asset growth on profitability. These results imply that profitability improvement is driven mainly through direct fund utilization and productive asset expansion rather than interest margin mechanisms.

KEYWORDS

thrid-party funds (tpf), asset growth, return on assets (roa), net interest margin (nim)..

Introduction

The banking industry contributes significantly to financial system stability and national economic development (kasmir, 2018). As intermediaries, banks channel funds from the public with excess funds to parties in need of financing (Siamat, 2019). Through their intermediation function, banks mobilize surplus funds from the public and allocate them to sectors requiring financing (Boyd, 2017). Thus, the health and performance of the banking industry often reflect a country's overall economic stability (Alireza et al., 2023).

The banking sector in Indonesia is currently facing intense competition to raise funds from the public, amid declining purchasing power and limited credit growth (bank indonesia, 2024). This situation contributes to a decline in banking profitability due to increasingly thin income margins and operational efficiency that is not yet fully optimal (OJK, 2024). This fierce competition also pushes banks to continuously adjust their fund management and financing strategies to maintain performance stability amid global economic pressures.

According to data from the Financial Services Authority (OJK), the profitability level of the national banking sector has shown a fluctuating pattern over the past three years, with the ROA ratio recorded at 2.43% in 2022 (Otoritas Jasa Keuangan, 2023), rising to 2.74% in 2023 (Indonesia Stock Exchange, 2024), and then falling again to 2.69% in 2024 (OJK, 2024). This pattern indicates that the effectiveness of bank asset management in generating profits remains suboptimal. The decline is primarily due to increased operating costs, a slowdown in credit growth, and a rise in expected credit losses (ECL) that put pressure on banks' net income (Nurtiandriyani Simamora & Khomarul Hidayat, 2024).

Profitability serves as a primary indicator of a bank's financial performance, as it demonstrates management's ability to efficiently allocate and utilize assets to generate profit (Subekti wahyu panji & Kusuma Wardana, 2022). The Return on Assets (ROA) ratio is a fundamental metric for assessing how effectively a company's productive assets generate net income. A higher ROA indicates superior asset utilization and overall bank performance (Mardiyani et al., 2025). Furthermore, (Tofan et al., 2022) found that increases in ROA are associated with enhanced management efficiency and greater financial stability for banks during periods of economic pressure.

Given these conditions, it is crucial to examine the factors that influence banking profitability, particularly Third-Party Funds and asset growth, both of which play significant roles in determining a bank's ability to generate profit (kasmir, 2018). An increase in TPF that is not accompanied by the distribution of productive loans can reduce intermediation efficiency, as excess funds are not optimally allocated to earning assets and do not generate proportional interest (Rejekiningsih et al., 2022). Meanwhile, high Asset Growth does not necessarily guarantee increased profitability if asset quality is not well managed and operational efficiency is low (Siamat, 2019). Net Interest Margin (NIM) is conceptualized as a mediating variable within the banking intermediation mechanism. Increases in Third-Party Funds modify the bank's funding cost structure, while Asset Growth shapes the composition and yield of earning assets. Both mechanisms are anticipated to influence NIM. As net interest income constitutes a major component of operating profit, changes in NIM are expected to impact Return on Assets (ROA)

(Endri et al., 2020). While alternative channels, such as fee-based income, credit risk, and cost efficiency, may also affect profitability, the present study focuses on the interest-based intermediation pathway to isolate the margin transmission mechanism.

Previous research has investigated factors affecting banking profitability, with a focus on Third-Party Funds and Asset Growth, but the findings remain inconclusive. Nevertheless, most prior studies have examined these relationships separately and within different banking segments or time periods, creating a contextual and methodological gap. (Tofan et al., 2022) reported that Third-Party Funds exert a positive and significant influence on Return On Assets (ROA), indicating that a bank's capacity to mobilize public funds enhances its intermediation function and profitability. In addition, research by (Isik et al., 2018) indicates that optimally managed Asset Growth can drive profitability by expanding bank operational activities. However, (Maulina et al., 2022) reported that Third-Party Funds do not exert a significant influence on ROA, while (Nurullah et al., 2024) observed that Asset Growth does not significantly impact profitability.

In addition to the direct impact on profitability, several studies also highlight the role of intermediation efficiency as reflected through the Net Interest Margin (NIM). Research by (Susilawati & Nurulrahmatiah, 2021) found that NIM has a significant effect on ROA, indicating that the efficiency in managing interest income is an essential factor in increasing bank profits. Meanwhile, (Hardianti, 2024) showed that Third-Party Funds affect NIM, and (Nurhasanah, 2017) stated that Asset Growth positively affects NIM if directed towards productive assets. However, research by (Rembet & Baramuli, 2020) reported inconsistent evidence concerning the effect of net interest margin (NIM) on profitability, as measured by return on assets (ROA). This finding indicates that the relationship between NIM and profitability may be contingent upon specific bank characteristics and prevailing market conditions. These differences in empirical findings indicate that the relationship among Third-Party Funds, Asset Growth, Net Interest Margin, and profitability remains inconsistent, warranting further study to gain a more comprehensive understanding.

To fill this research gap, this study focuses on private foreign exchange commercial banks. This type of bank has a larger scale of operations, engages in international transactions, and is more sensitive to changes in interest rates and global economic conditions (Subekti wahyu panji & Kusuma Wardana, 2022). With these characteristics, private foreign exchange commercial banks provide a relevant context for examining how financial intermediation efficiency, as reflected in NIM, can strengthen the relationship between TPF, Asset Growth, and profitability.

This study provides an incremental empirical contribution by simultaneously examining the effects of Third-Party Funds and Asset Growth on profitability through Net Interest Margin (NIM) within a unified structural model. While prior studies have explored partial relationships such as TPF–ROA, Asset Growth–ROA, or NIM–ROA most have not integrated these variables into a single mediation framework. By testing both the direct and indirect relationships concurrently, this study offers a more comprehensive empirical assessment of whether NIM functions as an intermediation efficiency channel linking funding structure and asset expansion to profitability performance. Therefore, the study refines existing evidence on banking profitability determinants rather than proposing a fundamentally new theoretical model. In addition, the findings are expected to provide practical implications for regulators and bank management in designing fund management policies and enhancing asset utilization efficiency to support the stability and competitiveness of the national banking industry.

The Influence of Third-Party Funds on Return On Assets (ROA)

Third-Party Funds (TPF) are defined as the primary source of bank funds from the public, cluding demand deposits, savings deposits, and other deposits (Kasmir, 2018). The level of TPF serves as an indicator of public trust in the banking sector. According to the agency theory proposed by (Panda & Leepsa, 2017), posits that conflicts may arise when managers (agents) do not consistently act in the best interests of owners or fund providers (principals), necessitating efficient management and monitoring mechanisms to minimize agency costs. Research by (Meliza, 2023) found that TPF exerts a positive and significant effect on the profitability of rural banks. Similar results were reported by (Fitriana et al., 2024), findings suggest that increased fund accumulation enhances a bank's capacity to distribute credit and raise net interest income. In addition, (Tofan et al., 2022) emphasize that stable TPF growth can directly increase Return On Asset (ROA) by expanding the capacity for financial intermediation. Thus, management effectiveness in managing Third-Party Funds becomes a vital factor in enhancing bank profitability. Drawing upon these empirical findings, the following hypothesis is proposed:

H1: Third-Party Funds have a significant impact on Profitability (ROA)

The Influence of Third-Party Funds on Net Interest Margin (NIM)

Beyond influencing profitability, Third-Party Funds also affect intermediation efficiency, as reflected by the Net Interest Margin (NIM). According to (Rasyid, 2017), reports that an increase in Third-Party Funds is directly proportional to a bank's capacity to generate net interest income, assuming the funds are allocated productively. Research by (Lengkoan et al., 2018) demonstrate that Third-Party Funds have a positive and significant effect on NIM in the banking sector, suggesting that higher levels of Third-Party Funds are associated with higher net income for banks. Furthermore, similar findings were reported by (Hardianti, 2024), which confirms that the growth of Third-Party Funds strengthens banks' ability to optimize interest-based income through more efficient management of

funding costs and earning assets, thereby improving the Net Interest Margin. This indicates that TPF plays a strategic role in increasing NIM as a key indicator of banking intermediation efficiency. Therefore, based on these findings, the following second hypothesis is proposed:
H2: Third-Party Funds have a significant impact on Net Interest Margin (NIM)

The Influence of Asset Growth on Return on Assets (ROA)

Asset Growth illustrates the extent to which a bank can expand its operational activities by increasing its productive assets. According to (Siamat, 2019), Asset Growth indicates a bank's ability to utilize collected funds into revenue-generating assets. From an agency theory perspective, managers as agents have discretion in asset expansion decisions, while principals expect these decisions to enhance firm value and financial performance. However, agency conflicts may arise when asset growth is not managed efficiently, potentially leading to suboptimal allocation and higher agency costs (Panda & Leepsa, 2017). Research by (Subekti wahyu panji & Kusuma Wardana, 2022) found that asset growth has a significant positive effect on ROA in Islamic banks. Additionally, research by (Aryani & isgiyarta, 2020) found that asset growth positively affects profitability among banks registered with the Financial Services Authority, as asset expansion enables banks to expand their financing distribution capacity and operational income. However, agency theory also emphasizes that inefficient Asset Growth can create conflicts of interest and, as a result, does not always lead to increased profitability. Accordingly, Asset Growth accompanied by efficient management is expected to improve bank profitability performance. Based on this, the following hypothesis is proposed:
H3: Asset Growth is significantly associated with ROA

The Influence of Asset Growth on Net Interest Margin (NIM)

In addition to affecting profitability, Asset Growth also influences banking intermediation efficiency, as reflected in the Net Interest Margin. Research by (Putra et al., 2020) explains that asset growth can become one of the determinants of Net Interest Margin, particularly when asset expansion is directed toward interest-earning productive assets. The study by (Nurhasanah, 2017) also shows that Asset Growth, when accompanied by optimized productive asset management, positively affects the Net Interest Margin, as increased assets enable banks to boost net interest income sustainably. Another finding, also reinforced by (Nurullah et al., 2024), is that an increase in efficiently managed productive assets can enhance banking intermediation efficiency, as reflected in a higher Net Interest Margin. Therefore, optimal Asset Growth becomes an essential factor in improving banking intermediation efficiency. Based on these findings, the fourth hypothesis is formulated:
H4: Asset Growth has a significant impact on Net Interest Margin (NIM)

The Influence of Net Interest Margin (NIM) on Return On Assets (ROA)

Net Interest Margin (NIM) serves as an indicator of a bank's efficiency in managing net interest income relative to its productive assets. NIM demonstrates the institution's capacity to sustain a profitable interest spread between interest income and interest expenses (Siamat, 2019). Research by (Mardiyani et al., 2020) found that NIM has a significant positive effect on Return on Assets (ROA), suggesting that higher NIM is associated with greater bank profitability. This result is also supported by (Astohar & Tri Sumiyanti, 2019), who argue that an increase in NIM signifies enhanced operational efficiency in intermediation activities, thereby directly contributing to profitability. Additionally, research by (Jati et al., 2022) confirm that NIM is a primary factor influencing bank profits, as an optimal NIM enables banks to increase operational income without a corresponding rise in risk. Therefore, the fifth hypothesis is proposed:
H5: Net Interest Margin (NIM) has a significant impact on profitability (ROA)

The Effect Third-Party Fund and Asset Growth on Return On Assets (ROA) through Net Interest Margin (NIM)

Furthermore, Net Interest Margin (NIM) serves as a mediating variable that explains the mechanism of the relationship between banking intermediation activities and profitability (ROA). From an agency theory perspective, management acts as an agent who is responsible for managing funds and earning assets on behalf of principals to generate optimal financial returns. Agency theory highlights that efficiency outcomes, including interest margin performance, reflect how well agents align their decisions with principals' interests and minimize agency costs (Panda & Leepsa, 2017). Previous research by (Salsabila et al., 2024) showed that NIM is used as a mediating variable in analyzing the effect of financial performance on ROA, making interest margin efficiency an essential factor in increasing bank profits. These findings are reinforced by (Purnamasari & Renanda, 2022) research, which found that NIM affects ROA and serves as a link between fund management and banking profitability. In line with this, (Subekti wahyu panji & Kusuma Wardana, 2022) found that NIM also mediates the relationship between Asset Growth and profitability. Similar evidence was reported by (Wahyudin et al., 2021), who emphasized that NIM can function as an intervening variable in explaining profitability mechanisms in banking. However, agency theory also suggests that if management decisions are not efficiently monitored, interest margin performance may weaken due to suboptimal asset allocation or higher funding costs, thereby reducing NIM's mediating role (Panda & Leepsa, 2017).
H6: Third-Party Fund has a significant impact on Profitability (ROA) through the Net Interest Margin (NIM)
H7: Asset Growth has a significant impact on Profitability (ROA) through the Net Interest Margin (NIM)

The conceptual framework illustrating the relationships among variables and hypotheses H1–H7 is presented in Figure 1.

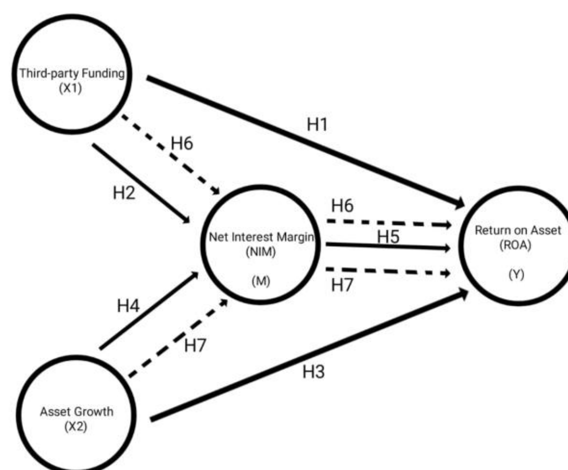


Figure 1. Framework Conseptual

Methods

This study uses a quantitative approach to objectively measure the relationship between variables through statistical analysis. This quantitative method is used to test theories and

Table 1. Operational Variable

Variable	Measurement	Source
Thrid-Party Funds (X1)	Current Account + Savings + Time Deposit	(kasmir, 2018)
Asset Growth (X2)	$\frac{\text{Asset t} - \text{Asset (t} - 1)}{\text{Asset (t} - 1)} \text{ x } 100\%$	(Siamat, 2019)
Net Interest Margin (M)	$\frac{\text{Net Interest Income}}{\text{Earning Asset}} \text{x} 100\%$	(kasmir, 2018)
Return On Asset (Y)	$\frac{\text{Earning Before Tax}}{\text{Total Asset}} \text{ x } 100\%$	(Siamat, 2019)

Source: Data processed by author (2026)

produce findings that can be generalized (Creswell & Creswell, 2018; Neuman, 2020). The type of research employed is causal-associative research, which aims to analyze relationships and influences among variables, as well as cause-and-effect relationships, using numerical data that can be empirically measured (Sugiyono, 2017). This study utilizes secondary data derived from the annual financial reports of publicly listed commercial banks, as published by the Indonesia Stock Exchange (IDX) for the period 2022 to 2024. In accordance with the selected research approach, all variables are operationalized to ensure clear and consistent measurement. The operationalization of variables aims to translate theoretical concepts into quantitative indicators that can be observed and analyzed statistically (Sekaran, U., & Bougie, 2016; Sugiyono, 2017). The research variables utilized in this study are summarized in Table 1.

All variable measurements follow commonly used financial ratio formulations in banking research to ensure comparability with prior empirical studies.

The study population consists of all private foreign exchange banks listed on the Indonesia Stock Exchange (IDX) during the 2022–2024 observation period (N = 32). Purposive sampling was conducted using predefined criteria. Banks were selected if they had completed an initial public offering (IPO) by 2022 to ensure data availability for the entire observation period, reported profits during 2022–2024 to enable comparability of profitability performance, and exhibited consistently increasing total assets during the same period to identify banks undergoing operational expansion. This criterion was applied to ensure that the selected banks represent institutions experiencing operational expansion, thereby providing a more consistent basis for analyzing the relationship between asset growth and profitability while reducing extreme fluctuations that could distort statistical estimation. This sampling criterion was also considered appropriate because the asset growth variable is measured using a growth formula that may produce negative values when a bank experiences a decline in total assets. Such negative values may result in extreme observations that could bias the statistical estimation. Therefore, selecting banks that demonstrate increasing asset trends helps ensure more stable data and allows the analysis to better capture the relationship between asset growth and profitability. Applying these criteria led to the exclusion of 15 banks, Seventeen banks met all selection criteria and provided complete financial statements for three consecutive years. Therefore, the total number of observations (n) was 51 (17 banks × 3 years).

Path analysis was performed using LISREL 8.8 to investigate the causal relationships among variables in the proposed research model. This method was chosen because it facilitates the evaluation of complex structural relationships by estimating both direct and indirect effects and testing mediation mechanisms within a unified model framework (Moqbel, 2020). This approach extends multiple regression by simultaneously estimating path coefficients for each causal relationship specified in the structural model. The analysis procedure began with developing a path diagram that reflects the hypothesized relationships, followed by estimating the structural coefficients using the maximum likelihood estimation method and evaluating their statistical significance through t-values. The coefficient of determination (R^2) was employed to evaluate the extent to which the independent variables account for variance in the dependent variable.

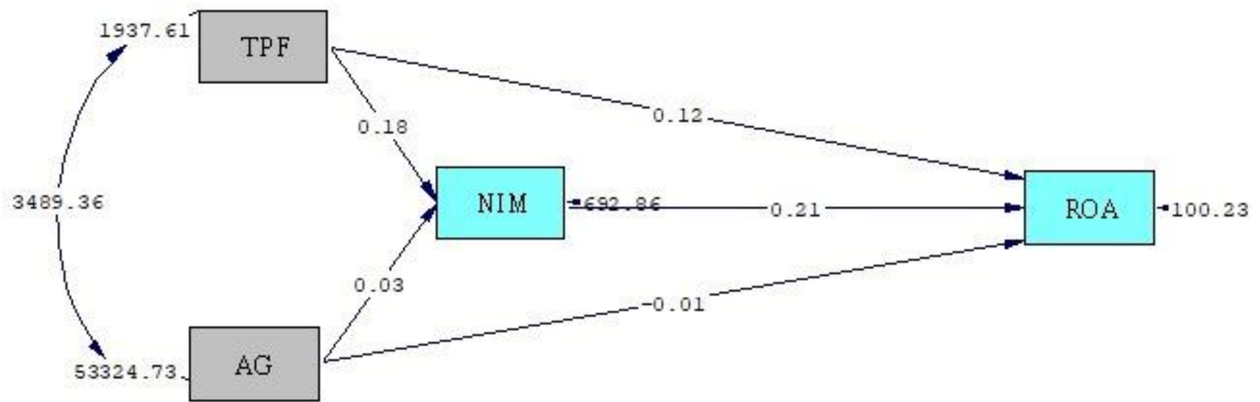
Furthermore, the Sobel test was employed to examine the significance of the mediation (Di Maria et al., 2024). The Sobel test was selected because it is frequently used in mediation analysis within structural path models to evaluate the significance of indirect relationships between variables. In this study, the data consist of secondary financial ratio data derived from published financial statements, and the results of the normality test indicate that the data are normally distributed. Therefore, parametric statistical testing can be applied, making the Sobel test an appropriate method for assessing mediation effects in the estimated model. Although bootstrap confidence intervals are also recommended in some recent mediation studies, the Sobel test remains a widely accepted approach for testing mediation effects when the assumptions of parametric analysis are satisfied.

Figure 2. Estimated Output

Result and Discussion

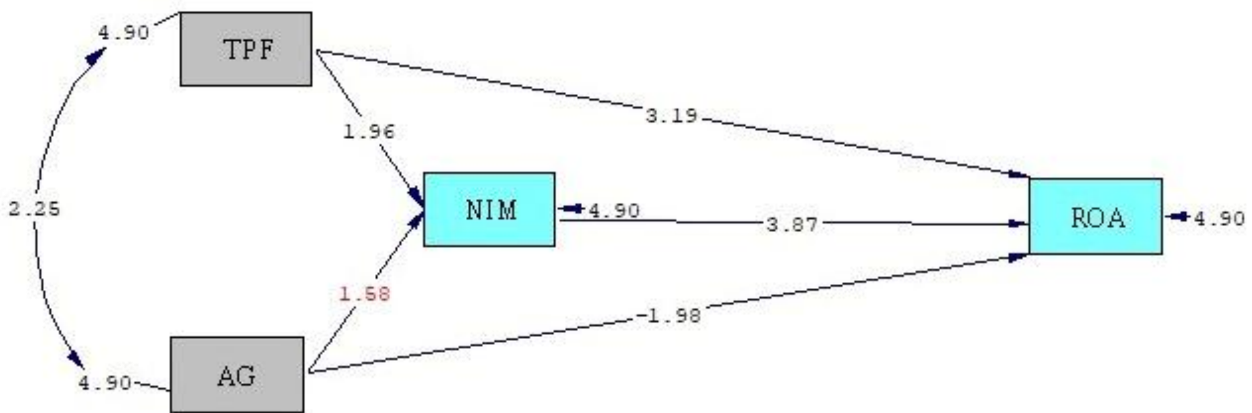
This study used a sample of 17 private foreign exchange commercial banks listed on the Indonesia Stock Exchange that met the criteria, namely PT. Bank Central Asia Tbk., PT. Bank Danamon Tbk., PT. Bank OCBC NISP Tbk., PT. Bank Permata Tbk., PT. Bank Pan Indonesia Tbk., PT. Bank Jago Tbk., PT. Bank IBK Indonesia, PT. Bank MNC Internasional, PT. Bank JTrust Indonesia Tbk., PT. Bank of Indonesia Tbk., PT. Bank Mayapada Tbk., PT. Bank Woori Saudara Indonesia 1906 Tbk., PT. Allo Bank Indonesia Tbk., PT. Bank Ganesha Tbk., PT. Bank Victoria Tbk., PT. Krom Bank Indonesia Tbk., and PT. Bank Nationalnobu Tbk. The present study examines the role of Net Interest Margin (NIM) as a mediating variable in the relationship between Third-Party Funds (TPF), Asset Growth, and profitability in private foreign exchange commercial banks. Path analysis using LISREL version 8.8 was employed to assess both direct and indirect effects among the variables.

Data processing was carried out by constructing path diagrams and estimating structural models using the Simplis



Source: Data processed by author (2026)

Figure 3. T-Value Output



Source: Data processed by author (2026)

Table 2. Summary of Structural Equation Estimation

Hypothesis	Influence of variable	Path Coeficient	T-Statistic	T-table	Conclusion
H1	TPF → ROA	0,12	3,19	1,96	Accepted
H2	TPF → NIM	0.18	1.96	1,96	Accepted
H3	AG → ROA	-0,01	-1.98	1,96	Accepted
H4	AG → NIM	0.03	1.68	1,96	Rejected
H5	NIM → ROA	0.21	3.87	1,96	Accepted
H6	TPF → NIM →ROA	0.18 * 0.21 = 0,0378	Z sobel = 1,74	1,96	Rejected
H7	AG →NIM →ROA	0.028 * 0.21 = 0,00588	Z sobel = 1,44	1,96	Rejected

Source: Procesed Data (2026)

syntax. The analysis process followed standard path analysis steps, including the formation of a correlation matrix, calculation of the inverse matrix, and estimation of path coefficients as shown in the following figure 2 and Figure 3.

Based on the LISREL 8.8 data analysis, here is a summary of the structural equations, including the estimated parameters and T-statistics. The resulting table is shown in Table 2.

Table 2 presents several important findings regarding the relationships among Third-Party Funds, Asset Growth, and Return on Assets (ROA) through Net Interest Margin (NIM) as a mediating variable.

Table 2 indicates that Third Party Funds (TPF) exhibit a path coefficient of 0.12 on Return on Assets (ROA), with a T-statistic of 3.19. As this T-statistic exceeds the critical value of 1.96, Third Party Funds are found to have a significant effect on ROA; therefore, H1 is accepted, and H0 is rejected. For the relationship between Third Party Funds and Net Interest Margin (NIM), the path coefficient is 0.18 with a T-statistic of 1.96. Based on a two-tailed test at the 5% significance level (α = 0.05), the critical value is 1.96; thus, the result meets the decision rule ($|t| \geq 1.96$), corresponding to $p \leq 0.05$. Therefore,

Third Party Funds can be considered to have a statistically significant effect on NIM, supporting H2 and rejecting H0. The association between Asset Growth and ROA shows a path coefficient of −0.013 with a T-statistic of −1.98. Based on a two-tailed test at the 5% significance level (α = 0.05), the absolute T-value (|−1.98| = 1.98) exceeds the critical value of 1.96, indicating statistical significance ($p \leq 0.05$). However, the negative coefficient suggests that higher asset growth is associated with lower ROA in this sample. In contrast, the relationship between asset growth and NIM presents a path coefficient of 0.028 and a T-statistic of 1.68. As this value is less than 1.96, asset growth does not significantly affect NIM; thus, H4 is rejected, and H0 is accepted. Finally, Net Interest Margin (NIM) shows a path coefficient of 0.21 with ROA and a T-statistic of 3.87. Given that this T-statistic is greater than 1.96, NIM significantly affects ROA, leading to the acceptance of H5 and the rejection of H0.

The Sobel Test results presented in Table 3 indicate that hypothesis H6, which posits an indirect effect of Third Party Funds on Return On Assets (ROA) through Net Interest Margin (NIM), is not supported. The Sobel Z value of 1.74 is less than the critical value of 1.96 at the 0.05 significance level. Therefore, NIM does not mediate the relationship between Third Party Funds (TPF) and ROA; H6 is rejected, and the null hypothesis (H0) is accepted. Similarly, the Sobel Test for the relationship between Asset Growth and ROA through NIM yields a Sobel Z value of 1.44, which is also below the 1.96 threshold at the 5% significance level. This finding demonstrates that NIM does not mediate the relationship between Asset Growth and profitability, leading to the rejection of H7 and the acceptance of H0.

Based on the LISREL data processing results, a structural equation consisting of 2 sub-structures was obtained. The testing for Substructure 1 and Substructure 2 will be explained in more detail below:

Testing path coefficient of substructure 1:

The analysis results, derived from the measurement of substructure 1, are interpreted as follows:

Return On Asset = 0.21*NIM +0.12*TPF -0.013*AG, Errorvar.= 100.23, R^2 = 0.42

(0.055) (0.036) (0.0068) (20.46)
3.87 3.19 -1.98 4.90

Based on this equation, an R2 score (coefficient of determination) of 0.42 was obtained, indicating that the estimated percentage of ROA is simultaneously influenced by Third-Party Funds (TPF), Asset Growth, and NIM to the extent of 42%. Meanwhile, the partial effect of 0.12 indicates the extent to which profit is explained by Third-Party Funds (TPF). In contrast, the partial effect of -0.013 suggests the extent to which Asset Growth explains profit. Meanwhile, the NIM value is 0.21 with respect to ROA.

Testing path coefficient of substructure 2:

Based on the findings from the measurement of substructure 2, the analysis results are interpreted as follows:

Net Interest Margin = 0.18*TPF + 0.028*AG, Errorvar = 692.86 , R^2 = 0.17

(0.092) (0.018) (141.43)
1.96 1.58 4.90

Based on this equation, an R2 score (coefficient of influence) of 0.17 is obtained, indicating that the estimated percentage of NIM is influenced by Third-Party Funds (TPF) and Asset Growth simultaneously by 17%. Meanwhile, the partial influence of 0.18 reflects the profit-generating ability explained by Third-Party Funds (TPF), whereas the partial influence of 0.028 reflects that explained by Asset Growth.

The Effect of Third-Party Fund on Profitability (ROA)

Research shows that Third Party Funds (TPF) have a strong impact on Return On Assets (ROA). This means a bank's ability to attract public funds, especially through savings, current accounts, and deposits, is key to its profitability. Since TPF is the main source of funding for banks, higher TPF levels allow banks to extend more loans, which are the main assets that generate interest income. In addition to increasing the volume of productive assets, the rise in TPF also enables banks to manage their funding structures more efficiently. The dominance of public funds, especially relatively lower-cost funds, helps banks reduce funding costs and optimize net interest income. This condition improves asset utilization and profitability, reflected in an increase in ROA. This result is in line with the research by (Fitriana et al., 2024) and (Tofan et al., 2022), who reported that third-party funds significantly influence banking profitability. Therefore, an increase in TPF corresponds with higher bank profitability.

The effect of Third-Party Fund on Net Interest Margin (NIM)

The research results show that Third-Party Funds (TPF) have a significant effect on Net Interest Margin (NIM). The results suggest that an increase in public funds, comprising demand deposits, savings, and time deposits, directly influences the bank's funding structure. When calculating Net Interest Margin (NIM), Third-Party Funds represent the primary source of interest expense. Therefore, the composition and cost of each deposit type determine the extent of the difference between the bank's interest income and interest expense. Operationally, the dominance of low-cost TPF, especially in demand deposits and savings, enables the bank to reduce interest expenses and increase net interest income from productive assets, such as loans. Efficient management of third-party funds results in a more optimal interest spread, thereby increasing NIM. These findings align with the research of (Lengkoan et al., 2018), which demonstrated that Third-Party Funds significantly affect banking net interest margin (NIM). (Hardianti, 2024) also reported similar results, indicating that Third-Party Funds are correlated with an increase in the interest margin.

The Effect of Asset Growth on Profitability (ROA)

The results show a statistically significant but negative association between asset growth and profitability (ROA). This finding indicates that although banks experienced asset expansion during the observation period, such growth did not necessarily improve profitability. Rapid asset expansion may increase operational costs, funding requirements, and risk exposure, which can temporarily reduce financial performance. In addition, asset growth may also include non-earning or low-productivity assets, such as excess liquidity or idle funds that generate limited returns. Consequently, although total assets increase, the income generated may not grow proportionally, resulting in a decline in ROA. These findings are consistent with those of (Isik et al., 2018) and (Subekti wahyu panji & Kusuma Wardana, 2022), who found that Asset Growth significantly influences bank profitability across institutions with different operational characteristics.

The effect of Asset Growth on Net Interest Margin (NIM)

The research findings indicate that asset growth does not significantly affect the net interest margin (NIM). This result implies that an increase in a bank's total assets during the observation period does not, in itself, lead to a higher net interest margin. This may indicate that the observed Asset Growth was not solely driven by an increase in interest-earning productive assets, such as loans and securities, but potentially also involved growth in non-earning assets such as cash, balances at Bank Indonesia, fixed assets, and other components that do not directly generate interest income. Additionally, an increase in productive assets that is not

accompanied by higher yields or efficient interest rate setting can also limit the rise in NIM. When productive assets increase but credit interest rates remain relatively stable or are pressured by competition, interest income increases modestly, while productive assets in the NIM calculation rise. This condition prevents the Net Interest Margin from growing significantly. This result is consistent with the findings of (Bagiana et al., 2019), who reported that Asset Growth does not significantly affect the Net Interest Margin (NIM) at Regional Development Banks in Indonesia.. However, it differs from the studies by (Nurhasanah, 2017) and (Putra et al., 2020), which stated that asset growth does affect the Net Interest Margin (NIM). This is because asset growth in those studies focused more on the expansion of earning and interest-bearing assets, accompanied by higher yields. Hence, Asset Growth had a positive impact. The findings of this study suggest that the expansion of private commercial banks' foreign-exchange-denominated assets is not solely attributable to growth in productive, interest-bearing assets with higher returns. Consequently, this expansion does not significantly enhance the net interest margin.

The effect of Net Interest Margin on Profitability (ROA)

Empirical evidence indicates that Net Interest Margin (NIM) significantly influences bank profitability, as measured by Return On Assets (ROA). This result demonstrates that NIM serves as a primary indicator of banking intermediation performance because it directly represents the difference between interest income generated from productive assets, such as loans and interest-bearing securities, and interest expenses paid on third-party funds. As this margin increases, the bank's net interest income rises, resulting in higher net profit from asset management. An increase in NIM strengthens ROA performance because net interest income is a significant component of bank operating profit, while total assets remain relatively constant or increase proportionally. Banks with high NIM demonstrate the ability to efficiently manage the interest rate structure of assets and liabilities, both through optimizing loan yields and controlling funding costs. This condition enhances the ability of assets to generate profit, as evidenced by the increase in return on assets (ROA). These findings align with the research of (Jati et al., 2022), which demonstrated that net interest margin (NIM) significantly affects ROA. Furthermore, the study by (Susilawati & Nurulrahmatiah, 2021) underscores the critical role of NIM in improving bank profitability.

The effect of the Third-Party Fund on ROA through NIM

The mediation test results demonstrate that Net Interest Margin (NIM) does not mediate the relationship between Third Party Funds (TPF) and Return On Assets (ROA). This outcome indicates that increases in TPF have a direct impact on bank profitability, independent of the net interest margin. TPF, comprising savings, demand deposits, and time deposits, represents the principal funding source for the development of productive assets. When TPF increases, banks can directly channel these funds into loans or financing that generate interest income, thus increasing net profit even though changes in NIM are relatively limited. The lack of NIM mediation indicates that an improvement in the spread between interest income and interest expense does not always accompany an increase in TPF. Under certain conditions, an increase in TPF is also accompanied by a rise in interest expenses, especially when funds grow primarily from time deposits with relatively high funding costs. As a result, net interest income does not increase proportionally with productive assets, so NIM does not function as the primary channel in boosting profitability. Similar findings were reported by (Hardianti, 2024) and (Rembet & Baramuli, 2020), indicating that an increase in Third-Party Funds can directly affect profit performance, with NIM not mediating.

Meanwhile, research with different results was conducted by (Salsabila et al., 2024), showing that NIM mediates in conventional banks with relatively more efficient funding and interest margin management, so NIM serves as a link between Third-Party Funds and profitability, and in the study by (Purnamasari & Renanda, 2022) it is stated that NIM can function as a mediating variable in the relationship between financial performance and profitability in Islamic banks. which has different revenue generation mechanisms and cost structures, making the role of intermediation more dominant. Meanwhile, in this study, using foreign-exchange private commercial banks, the increase in Third-Party Funds more quickly impacts profits, directly through credit expansion. At the same time, relatively high funding costs limit the rise in NIM, so NIM does not function as a mediating variable.

The effect of Asset Growth on ROA through NIM

The research results demonstrate that Net Interest Margin does not mediate the relationship between Asset Growth and profitability, although Asset Growth significantly influences Return On Assets (ROA). These findings indicate that increases in bank assets can enhance profitability through a direct mechanism, rather than via the Net Interest Margin. Within the banking report structure, Asset Growth may result from increases in non-interest-earning productive assets or in interest-earning assets with relatively stable yields, which do not necessarily widen the gap between interest income and interest expense. Furthermore, this condition indicates that the increase in net profit is driven more by business volume growth and overall asset utilization than by improved interest margin efficiency; meanwhile, in calculating NIM, the interest margin efficiency increases.

Meanwhile, in calculating NIM, an increase in productive assets that is not accompanied by a rise in credit yields or a decrease in funding costs results in net interest income not increasing proportionally with productive assets. As a result, NIM does not act as an intermediary between Asset Growth and profitability. This condition causes NIM to remain stagnant and profits to be relatively flat, so NIM does not serve as a link between Asset Growth and profitability. These results are in line with (Nurhasanah, 2017) and (Rembet & Baramuli, 2020), who stated that Asset Growth can directly influence profit performance without going through NIM, This variable serves as a mediator in the relationship between asset growth and profitability. However, inconsistent findings were reported by (Putra et al., 2020) and (Salsabila et al., 2024), who showed that Net Interest Margin acts as a mediator between Asset Growth and profitability. This is due to differences in the characteristics of banks and the financial structures being analyzed. Both studies examined banks with more efficient capital structures and interest-bearing asset management, so Asset Growth was accompanied by increases in yield and interest margins, This approach enables the Net Interest Margin to function as a mediating variable. In contrast, in the foreign exchange market, private commercial banks in this study, Asset Growth is not fully accompanied by increases in loan yields or funding cost efficiency, so profit growth occurs through a direct path, bypassing the Net Interest Margin.

Conclusion

This study investigates the effects of Third-Party Funds and Asset Growth on the profitability of private foreign exchange commercial banks, considering Net Interest Margin as a potential mediating variable. The findings demonstrate that Third-Party Funds, Asset Growth, and Net Interest Margin each significantly influence profitability. Third-Party Funds

significantly affect Net Interest Margin, while Asset Growth does not. Furthermore, the relationship between Asset Growth and Return on Assets is negative, indicating that higher asset expansion tends to reduce profitability during the observation period. Furthermore, Net Interest Margin does not function as a mediating variable, indicating that the effects of Third-Party Funds and Asset Growth on profitability are primarily direct.

This study emphasizes that the increase in banking profitability is determined not only by the optimization of Third-Party Fund collection but also by the growth of productively managed assets. Therefore, banks are advised to improve the efficiency and effectiveness of fund utilization, as the findings indicate that Third-Party Funds and Asset Growth have direct effects on ROA, while NIM does not serve as a significant mediating mechanism. This suggests that profitability improvements may depend more on overall fund deployment efficiency than on interest margin optimization alone. Such improvements are expected to strengthen Asset Growth's contribution to sustainable profitability.

The present study is limited by the range of variables, sample selection, and duration of observation. Future research should incorporate additional variables, including credit risk, operational efficiency, and macroeconomic factors, and broaden both the sample and observation period to provide a more comprehensive analysis of the determinants of banking profitability

Author contributions

Aulia Mawarni: conceived and designed the research, collected and managed the data, performed statistical analysis, and interpreted the results. Additionally, Aulia Mawarni drafted the manuscript, with a focus on the introduction, methodology, results, and discussion sections.

Mardiyani: provided academic supervision in research design, methodological validation, and interpretation of findings. Mardiyani also contributed to the critical revision and editing of the manuscript to ensure academic quality, coherence, and compliance with publication standards, and offered guidance on research limitations and implications for future studies.

All authors are responsible for every aspect of the work and have reviewed and approved the final version of the manuscript.

Funding

This study was fully supported by the authors' personal funds, without any financial assistance from institutions, organizations, or external parties. All stages of the research including data collection, research design, analysis, interpretation of findings, and manuscript preparation were conducted independently by the authors. The authors confirm that there was no external involvement or influence in any aspect of the study. This statement is provided to ensure transparency and to affirm the independence of the research process.

Acknowledgements

The authors would like to express their sincere appreciation to the Indonesia Stock Exchange (IDX) and the official corporate websites for providing access to the financial data used in this study. The authors are also grateful to Mrs. Mardiyani for her academic guidance and valuable input throughout the research process. In addition, the authors acknowledge all individuals who contributed constructive feedback and support during the preparation of this manuscript

Conflict of interest

The authors declare that no professional, financial, or personal conflicts of interest exist that could compromise the objectivity or independence of this study. No individual or organization holds a vested interest in the outcomes of this research. Additionally, the authors confirm the absence of personal or institutional relationships that could have influenced the research process, data analysis, or interpretation of the findings. This disclosure affirms the authors' commitment to integrity, transparency, and credibility, and confirms that the research was conducted independently and without undue external influence.

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