I-ECONOMICS: A Research Journal on Islamic Economics
ISSN 2548-5601, e-ISSN 2548-561X
Vol 11 No 1 June 2025

DETERMINANTS OF INCOME DIVERSIFICATION IN INDONESIAN ISLAMIC BANKS: AN ARDL APPROACH

Muhammad Deni Putra*[1], Muhammad Dedat Dingkoroci Akasumbawa[2], Laelani Rukmana[3]
[1]UIN Mahmud Yunus, Batusangkar, West Sumatra, Indonesia
[2,3]STAI NW Samawa, Sumbawa Besar, Nusa Tenggara Barat, Indonesia
Coresponding e-mail: *mdeniputra@uinmybatusangkar.ac.id

Abstract

The increasing competition and evolving regulatory landscape in the Islamic banking sector have prompted banks to diversify their income sources beyond traditional financing activities. This study investigates the determinants of income diversification in Indonesian Islamic banks by examining the influence of bank-specific and macroeconomic factors. The research is grounded in the need to enhance financial stability and sustainability in the dual banking system of Indonesia, where Islamic banks operate alongside conventional counterparts but face structural and operational limitations. The study employs the Autoregressive Distributed Lag (ARDL) approach using monthly panel data covering the period from January 2014 to February 2024. The results indicate that in the short run, income diversification is significantly influenced by NPF and inflation, suggesting that risk and price instability reduce income diversification efforts. In the long run, ROA and exchange rate show a positive and significant relationship with income diversification, highlighting the importance of profitability and exchange rate stability. CAR and SIZE do not show significant influence in either the short or long run. This study contributes to the limited empirical research on income diversification in Islamic banks in emerging economies. It also offers policy insights by identifying factors that could support diversification strategies, which are crucial for improving competitiveness and resilience in the Islamic banking industry.

Key Words: Islamic Banks, Income Diversification, Banks Spesific Factors, Macroeconomics Factors.

INTRODUCTION

Recent changes in banking regulations and policies, along with the global shift towards a universal banking system, have opened new opportunities for Islamic banks to diversify their income sources (Tok & Yesuf, 2022). Investigating income diversification in Islamic banking is particularly compelling, given its rapid growth despite initially operating on a relatively small scale. Significant recent literature has explored the motives behind income diversification in conventional banking. The Islamic economy in Indonesia has been developing since the establishment of Bank Muamalat on May 1, 1992. As of January 2020, there were 14 Islamic banks and 20 Islamic banking units (UUS) operating in Indonesia. The performance of these institutions remained stable in the fourth quarter of 2020. In 2021, the merger of three state-owned Islamic banks was considered a positive initial step to expand market reach and improve liquidity access through the parent banks; however, competition among Islamic banks remains weak, limiting industry acceleration and necessitating capacity expansion within Islamic banks (Abasimel, 2023).

Diversification enables banks to become more resilient during crises by, for instance, extending credit to innovative and promising firms. However, if all banks pursue similar diversification strategies and invest in alike portfolios, inter-bank overlap may occur, potentially threatening financial stability, especially amid economic shocks. Additionally, diversification can reduce risks in banking as long as income sources or assets are not directly correlated. Conventional banks typically face various risks, including credit risk, liquidity risk, operational risk, and market risk (Khan et al., 2023).

Financial institutions offer a wide range of products and services to harness the benefits of diversification, whose main advantages include increased profitability and economies of scale (Sururi et al., 2025). Profitability itself is often a key driver for diversification. From a size perspective, larger banks tend to be more diversified than smaller ones, which aligns with the notion that economies of scale are a primary motivation for diversification (Dávila & Walther, 2020). The capacity of Islamic banks can be evaluated by their ability to manage credit and liquidity risks effectively. Uncontrolled credit risk has been a significant cause of bank failures, as evidenced during the global financial crisis of 2008 (Aditya Kurnia Indrajaya et al., 2022).

Income diversification is a crucial strategy for banks, including Islamic banks, to manage risks and enhance financial stability. Several studies have explored the determinants of income diversification (Lahouel et al., 2024; Mala et al., 2023; Wang & Lin, 2021). These determinants can be classified into microeconomic and macroeconomic factors. On the microeconomic side, Capital Adequacy Ratio (CAR) is considered a key determinant. A high CAR reflects a bank's capital strength to absorb risks, enabling business expansion and product innovation that can boost non-traditional income. Financing to Deposit Ratio (FDR) also influences income diversification, as it indicates the bank's ability to channel collected funds to productive sectors; an optimal FDR supports income stability (Gafrej & Boujelbéne, 2022). Conversely, high Non-Performing Financing (NPF) signals credit risk that can hinder income diversification since potential losses prompt banks to exercise caution in expanding their operations (Tarawneh et al., 2024). Bank size (SIZE) remains a major factor, as larger banks generally enjoy economies of scale, broader market access, and greater capacity to develop diverse business lines that increase non-interest income. Profitability, measured by Return on Assets (ROA), is essential in shaping bank diversification policies; higher profitability increases the potential for diversifying income sources (Li et al., 2021).

From a macroeconomic perspective, variables such as inflation (INF) and exchange rate (EXC) also play significant roles. High inflation can erode purchasing power and increase operational costs, complicating banks' efforts to maintain a diversified business portfolio. Exchange rate fluctuations, especially in an open economy like Indonesia, introduce value risks and affect banks' income exposures related to international transactions or foreign currency denominations. Previous studies have demonstrated that low inflation and stable exchange rates are favorable to bank income (Paltrinieri et al., 2021). Income diversification varies across banks depending on their business models and economic environments. Traditional activities (e.g., deposits and loans) are generally considered stable despite being exposed to significant credit and liquidity risks. Although Islamic banks have made progress in developing Sharia-compliant financial products, the risk determinants specific to Islamic banking remain underexplored, particularly in developing countries such as Indonesia (Sururi & Haryono, 2024).

Despite several studies investigating income diversification from different angles Najam et al. (2022) and Mala et al. (2023), research focusing specifically on the determinants of income diversification in Islamic banking within developing countries like Indonesia remains relatively scarce. Islamic banks possess unique characteristics related to their business models, regulatory frameworks, and limited financial instruments, resulting in diversification dynamics that differ from conventional banks (Gafrej & Boujelbéne, 2022). Therefore, this study offers several important contributions and implications. First, it enriches the existing literature by providing empirical analysis of the factors influencing income diversification in Islamic banks, particularly in Indonesia as a developing country with a dual financial system. Second, it employs the Autoregressive Distributed Lag (ARDL) approach, enabling simultaneous examination of both short and long-term relationships, a method still infrequently used in Islamic banking diversification studies. Third, by integrating microeconomic and macroeconomic variables, the study offers a comprehensive understanding of the determinants shaping income diversification strategies amid economic dynamics and challenges facing the Islamic financial system. Consequently, the findings are expected to serve as valuable references for regulators, Islamic bank management, and future researchers in formulating policies and strategies that support the sustainable strengthening of Islamic banks' income structures.

LITERATURE REVIEW

This study is grounded in two main theoretical frameworks: the theory of financial intermediation and modern portfolio theory. The theory of financial intermediation highlights the bank's function in channeling funds from surplus to deficit units (Khafagy, 2023), where income diversification is a strategic response to intensifying competition, evolving customer preferences, and macroeconomic volatility. By diversifying income, banks can reduce reliance on traditional margin-based earnings and strengthen alternative revenue streams, such as fee-based services and investment returns (Pham et al., 2021).

Modern portfolio theory suggests that financial institutions can optimize their risk-return profiles through diversification across various assets and income sources, enabling them to better absorb macroeconomic shocks (Henriques & Neves, 2021). However, the application of these theories in the context of Islamic banking requires explicit consideration of Shariah principles. Islamic banks operate under unique constraints rooted in Shariah compliance, which prohibits interest (riba), excessive uncertainty (gharar), and speculative activities (maysir). These banks must also adhere to profit-and-loss sharing (PLS) models and avoid conventional hedging instruments, fundamentally altering their approach to risk management and income diversification. The maqāṣid al-sharīʿah (objectives of Islamic law) further emphasize ethical, social, and economic justice, guiding banks to prioritize risk-sharing and real economic activity over purely financial gains.

Consequently, the drivers and outcomes of income diversification in Islamic banks differ from those in conventional banks. For example, the absence of interest-based products and hedging instruments limits the range of diversification strategies available to Islamic banks. Instead, they rely more heavily on fee-based services, equity-based financing, and investment in Shariah-compliant assets. These constraints necessitate a careful examination of both internal (microeconomic) and external (macroeconomic) determinants of income diversification, particularly in developing economies such as Indonesia, where regulatory and financial market infrastructures for Islamic finance are still evolving.

By explicitly linking the study's hypotheses to Islamic finance principles and acknowledging the distinct operational environment of Islamic banks, this research provides a more nuanced understanding of how diversification strategies are shaped by Shariah compliance and the maqāṣid al-sharīʿah. This approach also clarifies why conventional diversification drivers may not fully apply to Islamic banks, highlighting the need for tailored business models that align with both financial theory and Islamic values.

Capital Adequacy Ratio and Income Diversification

The Capital Adequacy Ratio (CAR) reflects a bank's resilience against financial distress and its ability to absorb unexpected losses. A higher CAR suggests that the bank maintains a strong capital buffer, enabling it to engage in a wider range of financial activities with reduced risk exposure. Well-capitalized banks are generally more flexible in allocating funds toward income-generating innovations, including non-traditional products and services that can enhance income diversification. This aligns with the findings of Githaiga (2022), who observed that banks with higher CAR tend to diversify their income to stabilize earnings. For Islamic banks, which operate under profit-and-loss sharing principles and often face limited hedging options, maintaining a robust CAR is especially vital. A stronger capital position can facilitate expansion into new markets and products, consistent with the principles of financial intermediation theory.

H_1: CAR has a positive impact on income diversification in Indonesian Islamic Bank

Liquidity Risk and Income Diversification

The Financing to Deposit Ratio (FDR) serves as a key liquidity indicator, reflecting the proportion of deposits utilized in financing activities. A moderate FDR implies efficient fund utilization, which can contribute to stable earnings. However, an excessively high FDR may signal overexposure to credit risk, limiting the bank's ability to allocate resources for income diversification (Gafrej & Boujelbéne, 2022). Islamic banks, in particular, face challenges in liquidity management due to the absence of conventional interest-bearing instruments. Prior studies Pham et al. (2021) suggest that FDR

influences the bank's capacity to engage in diversified business activities, depending on how effectively liquidity is managed. Inadequate liquidity can force banks to rely on limited revenue sources, thereby reducing diversification.
H_2: FDR has a significant effect on income diversification in Indonesian Islamic banks.

Default Risk and Income Diversification

Non-Performing Financing (NPF) reflects the quality of a bank's financing portfolio and directly impacts profitability and operational sustainability. A high NPF level indicates an increased credit risk, which not only requires larger loan loss provisions but also constrains the bank's willingness and ability to invest in alternative income streams. Paltrinieri et al. (2021) have emphasized that poor asset quality limits banks' capacity to diversify because resources are diverted to cover losses and manage risk. For Islamic banks, where profit-sharing and asset-backed contracts dominate, maintaining asset quality is crucial to ensure consistent earnings. An elevated NPF ratio may also erode customer trust and discourage investment in innovative services (Rahmania et al., 2024). Thus, improving financing performance is a prerequisite for successful income diversification.
H_3: NPF has a negative effect on income diversification in Indonesian Islamic banks.

Profitability and Income Diversification

Return on Assets (ROA) measures how effectively a bank utilizes its assets to generate net income. A higher ROA suggests superior management performance, stronger profitability, and better financial health (Jihadi et al., 2021). Profitable banks have greater internal capital and risk tolerance, enabling them to pursue non-traditional business activities, such as investment services, digital banking, and advisory functions. Najam et al. (2022) provide empirical support for the positive association between ROA and income diversification, emphasizing that profitability is both a precondition and a consequence of diversified income structures. In the case of Islamic banks, higher ROA can signal successful implementation of Shariah-compliant financing models, thereby allowing for further expansion into diverse income-generating sectors.
H_4: ROA has a positive effect on income diversification in Indonesian Islamic banks.

Bank Size and Income Diversification

Bank size is often used as a proxy for economies of scale, operational capacity, and access to resources. Larger banks are generally more capable of investing in technology, human capital, and financial innovation, which facilitate the development of diverse income streams (Cuong et al., 2020). Moreover, larger institutions tend to have more established networks, allowing them to engage in complex financial services beyond traditional intermediation. Studies by Sururi & Haryono (2024) suggest that bank size plays a critical role in enabling diversification by reducing per-unit operational costs and increasing scope economies. For Islamic banks, size may also correlate with brand strength and the ability to absorb regulatory and market risks, allowing them to develop a more balanced income structure.
H_5: SIZE has a positive effect on income diversification in Indonesian Islamic banks.

Inflation and Income Diversification

Inflation introduces uncertainty in the macroeconomic environment, affecting both operating costs and customers' purchasing power. In periods of rising inflation, banks may seek to stabilize earnings by diversifying into inflation-resilient income sources, such as fee-based services or investment returns linked to real assets. Ashraf et al. (2023) highlight that inflation can prompt banks to reconfigure their income portfolios as a response to margin compression. For Islamic banks, which cannot charge interest, inflationary pressures may further erode real returns on financing. Thus, a proactive diversification strategy can act as a hedge against inflation-induced volatility.
H_6: INF has a negative effect on income diversification in Indonesian Islamic banks.

Exchange Rate and Income Diversification

Exchange rate volatility can expose banks to significant financial risks, especially those engaged in cross-border transactions or with foreign currency assets and liabilities. A fluctuating exchange rate may affect the value of foreign income streams and financing repayments denominated in foreign currencies. According to Gafrej & Boujelbéne (2022), banks operating in open economies often diversify their income sources as a risk management strategy to cushion against currency shocks. For Islamic banks in Indonesia, the lack of sophisticated hedging tools makes income diversification a crucial buffer against exchange rate instability. Moreover, exchange rate movements can affect investor confidence and demand for Shariah-compliant products, thereby influencing income generation.

H_7: EXC has a negative effect on income diversification in Indonesian Islamic banks.

RESEARCH METHOD

Data & Variables Measurement

This study employs a quantitative research approach, utilizing numerical data processed through statistical analysis tools. Secondary data were collected from the official websites of the Financial Services Authority of Indonesia (OJK), which provide financial statements of Islamic banks in Indonesia, as well as statistical reports from Bank Indonesia (BI) and the Ministry of Trade of the Republic of Indonesia. The observation period spans from January 2014 to February 2024, with data recorded on a monthly basis. The dependent variable in this study is income diversification, measured as the ratio of non-operating income to total income. The independent variables consist of microeconomic factors, namely Capital Adequacy Ratio (CAR), Financing to Deposit Ratio (FDR), Default Risk represented by Non-Performing Financing (NPF), Profitability measured by Return on Assets (ROA), and Bank Size (SIZE). Additionally, this study incorporates macroeconomic factors, including Inflation Rate (INF) and Exchange Rate (EXC). Table 1 summarizes the operational definitions and measurement methods of the variables used in this research.

Tabel 1.1
Variables Measurement

Variables	Definition	Measurement	Not.	Source
Dependent	Income Diversification	Non-Operational income to total income	NONI	Financial Services Authority (OJK)
Banks Spesific Factors	Capital Adequacy	Capital Adequacy Ratio	CAR	Financial Services Authority (OJK)
	Liquidity Risk	Financing to Deposite Ratio	FDR	
	Default Risk	Non Performing Financing to Total Outstanding	NPF	
	Profitability	Return On Assets	ROA	
	Bank Size	Logatirma Natural Total Aset	SIZE	
Macroeconomic factors	Inflations	Inflation Rate	INF	Bank Indonesia (BI) & the Ministry of Trade of the Republic of Indonesia
	Kurs	Exchange Rate	EXC	

Source: Author's Compilation (2025)

Data Analysis Techniques

This study employs the Autoregressive Distributed Lag (ARDL) approach for panel data analysis. The ARDL method is chosen because it can simultaneously estimate both short-run and long-run relationships between the dependent and independent variables, even when the variables have different orders of integration, specifically stationary at level (I(0) or first difference I(1), provided that none are

integrated of order two I(2). Prior to estimating the ARDL model, unit root tests for panel data such as Levin-Lin-Chu (LLC) or Im-Pesaran-Shin (IPS), are conducted to ensure that none of the variables contain second-order unit roots (Banda, 2021). Subsequently, cointegration testing is performed using the Bound Testing approach to determine whether a long-run equilibrium relationship exists between income diversification and the independent variables (CAR, FDR, NPF, ROA, SIZE, INF, and EXC). If cointegration is confirmed, the ARDL model can be estimated, yielding two key outputs: short-run coefficients represented by the lagged differenced variables, and long-run coefficients captured by the levels of the variables. To validate the robustness and stability of the model, parameter stability tests, including the CUSUM and CUSUM of Squares tests, are applied.

The general form of the ARDL model used in this study is as follows:

$$\Delta NONI_t = \alpha_0 \sum_{i=1}^{p} \alpha_{1i} \Delta NONI_{t-i} + \sum_{i=1}^{q2} \alpha_{2i} \Delta CAR_{t-i} + \sum_{i=1}^{q3} \alpha_{3i} FDR_{t-i} + \sum_{i=1}^{q4} \alpha_{4i} NPF_{t-i} + \sum_{i=1}^{q5} \alpha_5 \Delta ROA_{t-i} + \sum_{i-1}^{q6} \alpha_6 \Delta SIZE_{t-i} + \sum_{i-1}^{q7} \alpha_7 \Delta INF_{t-i} + \sum_{i-1}^{q8} \alpha_8 \Delta EXC_{t-i} + \beta_1 NONI_{t-i} + \beta_2 CAR_{t-i} + \beta_3 FDR_{t-i} + \beta_4 NPF_{t-i} + \beta_5 ROA_{t-i} + \beta_6 SIZE_{t-i} + \beta_7 INF_{t-i} + \beta_8 EXC_{t-i} + V_{1t}$$

The mathematical triangle notation (Δ) represents the first-difference operator, and $V1t$ denotes the white noise disturbance term. Once a cointegration relationship is established, the ARDL approach can be represented using an Error Correction Model (ECM) as follows:

$$\Delta Y_t = \alpha_0 \sum_{i=1}^{p} \alpha_{1i} \Delta Y_{t-i} + \sum_{i=1}^{q2} \alpha_{2i} \Delta CAR_{t-i} + \sum_{i=1}^{q3} \alpha_{3i} \Delta FDR_{t-i} + \sum_{i=1}^{q4} \alpha_{4i} NPF_{t-i} + \sum_{i=1}^{q5} \alpha_5 \Delta ROA_{t-i} + \sum_{i-1}^{q6} \alpha_6 \Delta SIZE_{t-i} + \sum_{i-1}^{q7} \alpha_7 \Delta INF_{t-i} + \sum_{i-1}^{q8} \alpha_8 \Delta EXC_{t-i} + \theta ECT_{t-i} + \varepsilon_{t-1}$$

where θ epresents the adjustment coefficient, and ECT denotes the error correction term. The variable Y refers to the three dependent variables used in this study, abbreviated as Y for simplicity. The coefficient of the error correction term is expected to be negative and statistically significant as confirmation of the presence of a long-run cointegration relationship.

RESULT AND DISCUSSION

Result

Table 2 shows that income diversification (NONI) has a low mean value of 0.0093 and a small standard deviation, indicating that Islamic banks in the sample still rely heavily on core income, with limited efforts toward diversifying income sources. The capital adequacy ratio (CAR) averages 20.84%, well above regulatory requirements, showing strong capital buffers, though variation remains significant. The non-performing financing (NPF) ratio is 3.59%, suggesting moderate credit risk exposure. Meanwhile, return on assets (ROA) is relatively low at 1.48%, reflecting modest profitability among the banks. Exchange rate (EXC) shows the highest variation, indicating macroeconomic volatility that may influence financial performance. Overall, the descriptive statistics suggest that while capital strength is solid, income diversification and profitability remain areas for improvement.

Table 2.
Descriptive Statistics

Variable	Mean	Max.	Min.	Std. Dev.	Obs.

NONI	0.009252	0.065376	0.000620	0.007092	98
CAR	20.84117	26.28166	14.72000	3.500435	98
FDR	79.31642	89.32000	68.97524	4.327109	98
NPF	3.593014	6.170000	2.052008	1.033195	98
ROA	1.484663	2.175460	0.160000	0.506755	98
SIZE	12.77316	13.29583	12.25302	0.289561	98
INF	3.122143	5.950000	1.320000	1.089916	98
EXC	14308.65	16367.00	12998.00	754.8974	98

Source: Data processed (2025)

Based on the results presented in Table 3, all variables in this study are non-stationary at level but become stationary after first differencing, as indicated by both the Augmented Dickey-Fuller (ADF) and Phillips-Perron (PP) tests. This suggests that all variables are integrated of order one, I(1), and none are integrated of order two, I(2). The consistency between the two testing methods strengthens the reliability of the stationarity assessment. This finding confirms that the core requirement for applying the Autoregressive Distributed Lag (ARDL) model is met, as the ARDL approach accommodates a combination of I(0) and I(1) variables, but not I(2). Therefore, it is appropriate to proceed with cointegration testing and the estimation of the ARDL model, as the data meet the necessary prerequisites for time series analysis involving variables with different levels of integration.

Table 3.
Unit Root Test Result

Variable	Augmented Dickey-Fuller		Phillips-Perron	
	Level	First Difference	Level	First Difference
NONI	-8.015229***	-11.20330***	-8.179258***	-35.36652***
CAR	-1.129792	-10.19575***	-1.113667	-10.19575***
FDR	-2.142808	-10.95765***	-2.142808	-10.94873***
NPF	-2.173620	-5.970092***	-1.147322	-13.46705***
ROA	-1.617719	-11.43363***	-1.520378	-11.42746***
SIZE	-0.773790	-6.447903***	-0.384557	-13.01875***
INF	-2.691119*	-3.580787***	-2.178673	-9.379938***
EXC	-2.081882	-11.25861***	-1.746435	-16.85965***

Note: *, **, ***, denote significant at 1%, 5%, and 10%
Source: Data processed (2025)

Table 4 presents the results of the ARDL Bound Test for cointegration. The calculated F-statistic value of 11.13993 is significantly higher than the upper critical bounds at the 1%, 5%, and 10% significance levels. This clearly indicates the existence of a long-run cointegration relationship among the variables. Given this result, it can be concluded that the variables move together over the long term. Therefore, it is appropriate to proceed with the estimation of the ARDL model using the Error Correction Model (ECM) approach, which allows for analyzing both the short-run dynamics and long-run equilibrium relationships within the model framework.

Table 4.
Bound test Cointegration

F-statistic	K	Significant Level	Critical Bounds		Cointegration
			Lower Bound I(0)	Upper Bound I(1)	
11.13993	7	1%	2.73	3.9	Yes
		5%	2.17	3.21	Yes
		10%	1.92	2.89	Yes

Source: Data processed (2025)

Table 5 presents the short-run and long-run estimation results of the determinants of income diversification in Islamic banks using the ARDL model. In the short run, CAR shows a marginally significant negative effect at the second lag, suggesting that higher capital adequacy two periods prior slightly constrains diversification activities, possibly due to conservative capital policies. The FDR exhibits a significant negative impact both contemporaneously and at lag one, indicating that a higher proportion of financing relative to deposits limits income diversification by emphasizing traditional banking activities. NPF shows a mixed effect, with the second lag positively influencing diversification, implying that past increases in credit risk may prompt banks to diversify income sources as a compensatory strategy. ROA negatively and significantly affects diversification, meaning that more profitable banks tend to focus on core income streams and reduce diversification efforts in the short term. INF also negatively impacts diversification, reflecting the difficulties banks face in maintaining diversified income during periods of rising prices. EXC have a positive but marginally significant effect, suggesting that currency volatility encourages diversification to mitigate exchange rate risk. The error correction term is negative and highly significant, confirming a stable long-run equilibrium with a swift adjustment speed.

In the long run, FDR continues to negatively affect income diversification, reinforcing the tendency of banks with higher financing-to-deposit ratios to concentrate on traditional financing activities. ROA maintains its negative relationship, indicating that sustained profitability reduces the incentive for diversification. Inflation remains a significant negative determinant, showing that prolonged inflationary pressures hinder diversification capacity. Exchange rate volatility maintains a positive but marginal influence, consistent with its role in motivating diversification as a risk management tool. Other variables such as CAR, NPF, and SIZE do not show significant long-term effects. Overall, these results suggest that Islamic banks' income diversification strategies are influenced by both internal financial ratios and macroeconomic conditions, with risk management considerations playing a key role in shaping diversification behavior in both the short and long run.

Table 5.
Short-run and Long-run Estimation results

Variables	Coeff.	t-Statistic	Prob.
NONI(-1)	-0.059612	-0.557346	0.5789
CAR	0.001130	1.087691	0.2801
CAR(-1)	0.000897	0.686077	0.4947
CAR(-2)	-0.001887*	-1.815803	0.0732
FDR	-0.000549**	-2.379821	0.0198
NPF	0.002772	0.770508	0.4433
NPF(-1)	-0.002320	-0.562419	0.5754
NPF(-2)	0.007810**	2.189484	0.0316
NPF(-3)	-0.000269	-0.066084	0.9475
NPF(-4)	-0.006453*	-1.904601	0.0605
ROA	-0.008993**	-2.405324	0.0185
SIZE	0.011407	1.032908	0.3048
INF	-0.004727**	-2.346028	0.0215
INF(-1)	0.003073	1.553404	0.1244
EXC	3.02E-06*	1.871503	0.0650
CointEq(-1)	-1.059612***	-10.51391	0.0000
Variables	**Coeff.**	**t-Statistic**	**Prob.**
CAR	0.000132	0.169041	0.8662
FDR	-0.000518**	-2.445588	0.0167
NPF	0.001455	0.547223	0.5858

ROA	-0.008487**	-2.413843	0.0181
SIZE	0.010765	1.044877	0.2993
INF	-0.001562**	-2.451351	0.0165
EXC	2.85E-06*	1.903131	0.0607
C	-0.118390	-0.907858	0.3667

Note: *, **, ***, denote significant at 1%, 5%, and 10%
Source: Data processed (2025)

Figure 2 displays the results of the CUSUM and CUSUM of Squares (CUSUMQ) tests. The CUSUM line remains within the 5% significance boundaries throughout the period, indicating stability in the model's coefficients. Similarly, the CUSUMQ plot also lies within the critical bounds, suggesting that there is no structural break in the variance of the residuals. Together, these results confirm that the estimated ARDL model is structurally stable over time and reliable for inference.

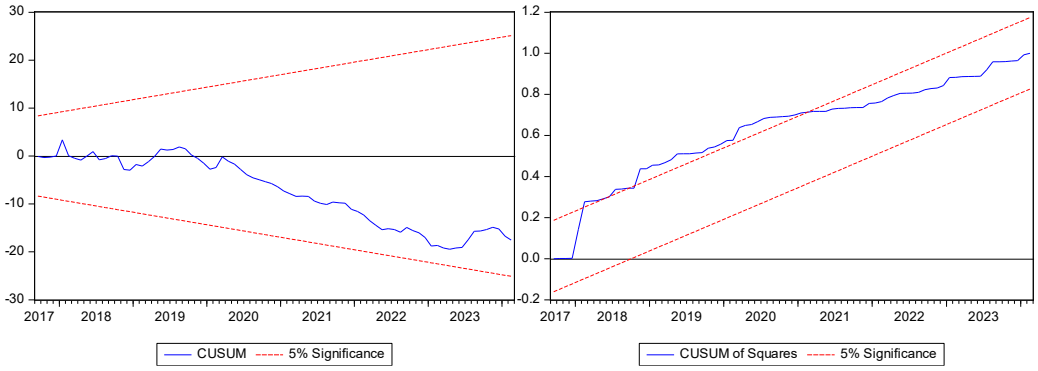

Figure 2. CUSUM & CUSUMQ
Source: Data processed (2025)

Discussion

This study examines the determinants of income diversification in Indonesian Islamic banks, distinguishing between their short-run and long-run effects. The empirical findings reveal that not all variables exhibit consistent effects across these two time horizons. In the short run, the Capital Adequacy Ratio (CAR) shows a negative yet inconsistent impact on income diversification. Theoretically, a higher CAR reflects a stronger capital base, allowing banks to take on more risk and develop new revenue streams (Abbas et al., 2021). However, within the Islamic banking framework, a conservative approach combined with adherence to Shariah principles may limit banks from venturing into non-traditional sectors, despite having sufficient capital. In the long run, CAR does not exhibit a significant relationship with diversification, supporting the findings of Bintoro & Rahmadhani (2021), who argue that capital primarily functions as a risk buffer rather than a catalyst for income diversification.

The Financing to Deposit Ratio (FDR) consistently demonstrates a negative effect on diversification in both the short and long run. This indicates that Islamic banks highly focused on core intermediation activities tend to avoid expanding into non-financing income segments such as fee-based services. This finding aligns with Gafrej & Boujelbéne (2022), who observed that Islamic banks are more committed to traditional, Shariah-compliant financing rather than broadening their income sources through financial services. In the Indonesian context, a high FDR also reflects extensive engagement in real-sector financing, which often carries fixed margins, reducing incentives for diversification. The Non-Performing Financing (NPF) variable shows a positive short-run effect (at lag 2) but a negative long-run impact. In the short term, rising NPF levels push banks to seek alternative income sources to compensate for deteriorating asset quality, a defensive response to credit risk (Agrawal & Magar, 2023). However, in the long run, persistently high credit risk may limit a bank's capacity to innovate or expand into new revenue areas, ultimately constraining sustainable diversification. This is supported by Githaiga (2022),

who found that banks with poor asset quality tend to exhibit lower levels of long-term income diversification.

Return on Assets (ROA) displays a negative relationship with diversification in both the short and long run, indicating that more efficient or profitable banks tend to focus on their core business and are less inclined to diversify. This finding supports the "performance-stability trade-off" theory, which posits that high-performing banks prioritize stability and risk aversion, thus limiting their involvement in diversification activities that could introduce additional volatility (Dias, 2021). The theoretical foundation for this trade-off is that banks with strong performance metrics are more likely to maintain proven strategies rather than pursue new, potentially riskier, non-traditional income channels. This perspective is empirically supported by studies such as Najam et al. (2022), which also found a negative impact of ROA on diversification.

Bank size (SIZE) does not show a significant impact on diversification in either the short or long run, indicating that asset size has not yet become a decisive factor in shaping income diversification strategies among Indonesian Islamic banks. This finding is consistent with previous research, which suggests that the impact of size on diversification typically emerges only when banks achieve substantial market dominance and operational scale—conditions that Indonesian Islamic banks have not fully realized (Sururi & Haryono, 2024). The relatively small scale of most Islamic banks in Indonesia, compared to their conventional counterparts, limits their ability to exploit economies of scale or expand into a wider range of financial products and services (Razali et al., 2024). Additionally, prior studies have shown that the benefits of size, such as greater capacity to absorb risks and invest in new business lines, tend to materialize only when banks surpass certain thresholds of assets and market power (Berger et al., 2010). In the Indonesian context, the Islamic banking sector remains fragmented and faces structural challenges, including limited market share and strong competition from conventional banks, which may further explain the absence of a significant size effect. Thus, the insignificance of SIZE in this study reflects the current structural characteristics of the Indonesian Islamic banking industry rather than being attributable to speculative factors such as conservative Shariah policy or managerial preferences, highlighting the need for further sectoral consolidation and growth before size can become a meaningful driver of diversification.

The macroeconomic variable inflation demonstrates a negative effect in both the short and long term. Price instability introduces uncertainty in planning and margin setting, particularly in Shariah-compliant contracts such as murabaha and ijarah, prompting banks to prioritize income stability over diversification (Adem, 2023). In the long run, inflation also erodes purchasing power and narrows the market potential for innovative financial products that could support diversification strategies. Meanwhile, the exchange rate shows a positive influence in the long run, although only approaching significance. This may reflect banks' increasing exposure to international financial activities such as remittances, trade finance, and foreign investments, which are becoming more relevant in the global Islamic finance landscape. Exchange rate fluctuations may encourage banks to build a more diversified income portfolio as a risk management strategy (Napitupulu et al., 2024).

Overall, the findings suggest that income diversification in Islamic banks is shaped not only by internal factors such as profitability and asset quality, but also by macroeconomic conditions that create both incentives and constraints for strategic development. In the short run, risk-related factors such as NPF and inflation prompt immediate bank responses to revenue pressures. In the long run, variables such as exchange rates and operational efficiency determine the strategic direction of diversification. These results underscore the importance of considering temporal context, financial system stability, and the objectives of maqāṣid al-sharī'ah, emphasizing sustainability, fairness, and asset protection, when formulating income diversification strategies in Islamic banking.

CONCLUSION

This study examines the determinants of income diversification in Indonesian Islamic banks using the Autoregressive Distributed Lag (ARDL) approach, revealing that diversification strategies are shaped by both internal bank characteristics (such as default risk and profitability) and macroeconomic

conditions (including inflation and exchange rates). In the short term, factors like non-performing financing and inflation prompt banks to seek alternative revenue sources, while in the long run, profitability and exchange rate stability become more significant drivers of diversification. Interestingly, traditional determinants such as capital adequacy (CAR) and bank size (SIZE) show inconsistent effects, highlighting the unique operational environment of Islamic banks, which are governed by Shariah principles and face constraints like the prohibition of hedging instruments and the reliance on profit-and-loss sharing (PLS) models.

The policy implications of these findings are substantial and call for specific, actionable steps by Indonesian regulators. First, aligning with Indonesia's Financial Sector Master Plan (2023–2027), regulators should consider revising the Financial Services Authority Regulation (POJK) to foster the development of Sukuk markets, including streamlining approval processes and enhancing secondary market liquidity. This would provide Islamic banks with more Shariah-compliant assets for diversification. Second, there is a need to introduce more granular risk management frameworks tailored to Islamic banks, such as standardized risk-sharing ratios and mandatory disclosure requirements for mudarabah and musharakah contracts, to help mitigate default risk inherent in PLS models. Third, macroeconomic coordination with Bank Indonesia to stabilize exchange rates is essential, as volatility in this area can discourage long-term diversification efforts. Fourth, encouraging sectoral consolidation through mergers among smaller Islamic banks could help them achieve economies of scale and address the observed insignificance of SIZE as a diversification driver, in line with the Master Plan's objective of increasing Islamic banking market share.

Despite its contributions, this study has several limitations. The sample is limited to Islamic commercial banks and excludes Islamic windows (UUS) of conventional banks, which account for a significant portion of Indonesia's Islamic banking assets; this limits the generalizability of the findings. Additionally, the study relies on accounting-based measures of diversification, which may not fully capture strategic or operational efforts. Methodologically, while the ARDL approach is effective for analyzing short- and long-run relationships, it does not fully address issues such as endogeneity and unobserved heterogeneity. Future research should incorporate data from UUS to provide a more comprehensive sectoral analysis, employ advanced econometric techniques like GMM or panel vector autoregression (PVAR) for deeper causal insights, and integrate strategic indicators to better reflect managerial decision-making. Moreover, further studies could explore how maqāṣid al-sharīʿah principles, including equitable risk-sharing and social welfare, influence diversification incentives, especially in the context of Indonesia's evolving ESG framework and its alignment with the objectives of Islamic finance.

REFERENCES

Abasimel, N. A. (2023). Islamic Banking and Economics: Concepts and Instruments, Features, Advantages, Differences from Conventional Banks, and Contributions to Economic Growth. *Journal of the Knowledge Economy*, *14*(2), 1923–1950. https://doi.org/10.1007/s13132-022-00940-z

Abbas, F., Ali, S., Moudud-Ul-Huq, S., & Naveed, M. (2021). Nexus between bank capital and risk-taking behaviour: Empirical evidence from US commercial banks. *Cogent Business & Management*, *8*(1). https://doi.org/10.1080/23311975.2021.1947557

Adem, M. (2023). Impact of income diversification on bank stability: A cross-country analysis. *Asian Journal of Accounting Research*, *8*(2), 133–144. https://doi.org/10.1108/AJAR-03-2022-0093

Aditya Kurnia Indrajaya, Stevan Goklas Simanjuntak, & Susy Muchtar. (2022). Bank Risk, Profitability, dan Investment Diversification: Studi Perusahaan Perbankan di Indonesia. *Jurnal Ekonomi*, *27*(1), 64–79. https://doi.org/10.24912/je.v27i1.855

Agrawal, Dr. V., & Magar, Dr. A. (2023). Non-Performing Assets (NPA) in Indian Banking: Causes, consequences, and remedial measures. *International Journal of Research in Management*, *5*(2), 62–65. https://doi.org/10.33545/26648792.2023.v5.i2a.95

Ashraf, Y., Nazir, M. S., Din, S. U., Yaqoob, M. S., & Shahzad, A. (2023). What determines income diversification of banking firms in Pakistan. *International Journal of Business Excellence*, *30*(1), 1. https://doi.org/10.1504/IJBEX.2023.130776

Banda, L. G. (2021). Determinants of Commercial Banks' Performance in Malawi: An Autoregressive Distributed Lag (ARDL) Approach. *National Accounting Review*, *3*(4), 422–438. https://doi.org/10.3934/nar.2021022

Berger, A. N., Hasan, I., & Zhou, M. (2010). The effects of focus versus diversification on bank performance: Evidence from Chinese banks. *Journal of Banking & Finance*, *34*(7), 1417–1435. https://doi.org/10.1016/j.jbankfin.2010.01.010

Bintoro, M. I., & Rahmadhani, F. (2021). *The Influence of Capital Adequacy, Credit Risk, Liquidity, Operational Cost, Income Diversification, Firm Size and Ownership Structure on the Profitability of Bank:* 4th International Conference on Sustainable Innovation 2020-Accounting and Management (ICoSIAMS 2020), Yogyakarta, Indonesia. https://doi.org/10.2991/aer.k.210121.018

Cuong, H. V., Ngoc Luu, H., Quynh Thi Nguyen, L., & Chu, V. T. (2020). Income structure, diversification strategy and owners' benefit in cooperative financial institutions. *International Journal of Managerial Finance*, *16*(4), 481–500. https://doi.org/10.1108/IJMF-11-2018-0346

Dávila, E., & Walther, A. (2020). Does size matter? Bailouts with large and small banks. *Journal of Financial Economics*, *136*(1), 1–22. https://doi.org/10.1016/j.jfineco.2019.09.005

Dias, R. (2021). Capital regulation and bank risk-taking – new global evidence. *Accounting & Finance*, *61*(1), 847–884. https://doi.org/10.1111/acfi.12595

Gafrej, O., & Boujelbéne, M. (2022). The impact of performance, liquidity and credit risks on banking diversification in a context of financial stress. *International Journal of Islamic and Middle Eastern Finance and Management*, *15*(1), 66–82. https://doi.org/10.1108/IMEFM-09-2020-0488

Githaiga, P. N. (2022). Income diversification and bank risk-taking: The moderating role of intellectual capital. *Cogent Business & Management*, *9*(1), 2149142. https://doi.org/10.1080/23311975.2022.2149142

Henriques, C., & Neves, E. (2021). Exploring the trade-off between liquidity, risk and return under sectoral diversification across distinct economic settings. *The Journal of Risk Finance*, *22*(2), 130–152. https://doi.org/10.1108/JRF-05-2020-0101

Jihadi, M., Vilantika, E., Hashemi, S. M., Arifin, Z., Bachtiar, Y., & Sholichah, F. (2021). The Effect of Liquidity, Leverage, and Profitability on Firm Value: Empirical Evidence from Indonesia. *The Journal of Asian Finance, Economics and Business*, *8*(3), 423–431. https://doi.org/10.13106/JAFEB.2021.VOL8.NO3.0423

Khafagy, A. (2023). The Concrete Function of the Banking System: Samir Amin's Monetary Theory of Financial Underdevelopment. *SSRN Electronic Journal*. https://doi.org/10.2139/ssrn.4317363

Khan, N., Ramzan, M., Kousar, T., & Shafiq, M. A. (2023). Impact of Bank Specific Factors on Credit Risk: Evidence from Islamic and Conventional Banks of Pakistan. *Pakistan Journal of Humanities and Social Sciences*, *11*(1), 580–592. https://doi.org/10.52131/pjhss.2023.1101.0375

Lahouel, B. B., Taleb, L., Zaied, Y. B., & Managi, S. (2024). Financial stability, liquidity risk and income diversification: Evidence from European banks using the CAMELS–DEA approach. *Annals of Operations Research*, *334*(1–3), 391–422. https://doi.org/10.1007/s10479-022-04805-1

Li, X., Feng, H., Zhao, S., & Carter, D. A. (2021). The effect of revenue diversification on bank profitability and risk during the COVID-19 pandemic. *Finance Research Letters*, *43*, 101957. https://doi.org/10.1016/j.frl.2021.101957

Mala, C. M. F., Jumono, S., Lastro, W., & Iskandar, Y. (2023). INCOME DIVERSIFICATION, PROFITABILITY, AND RISK IN ISLAMIC BANKING IN INDONESIA. *International Journal of Business, Law, and Education*, *4*(2), 942–951. https://doi.org/10.56442/ijble.v4i2.266

Najam, H., Abbas, J., Álvarez-Otero, S., Dogan, E., & Sial, M. S. (2022). Towards green recovery: Can banks achieve financial sustainability through income diversification in ASEAN countries? *Economic Analysis and Policy*, *76*, 522–533. https://doi.org/10.1016/j.eap.2022.09.004

Napitupulu, B. E., Rajagukguk, J. S. S., & Siswono, S. (2024). The Managerial Economics Implications Of Rupiah Exchange Rate Fluctuations On Investment And Corporate Growth. *International Journal of Informatics, Economics, Management and Science*, *3*(2), 174. https://doi.org/10.52362/ijiems.v3i2.1528

Paltrinieri, A., Dreassi, A., Rossi, S., & Khan, A. (2021). Risk-adjusted profitability and stability of Islamic and conventional banks: Does revenue diversification matter? *Global Finance Journal*, *50*, 100517. https://doi.org/10.1016/j.gfj.2020.100517

Pham, D. K., Ngo, V. M., Nguyen, H. H., & Le, T. L. V. (2021). Financial crisis and diversification strategies: The impact on bank risk and performance. *Economics and Business Letters*, *10*(3), 249–261. https://doi.org/10.17811/ebl.10.3.2021.249-261

Rahmania, T., Wulandari, S. S., & Marfu, A. (2024). Sustainable financial institution in Indonesia: An empirical analysis of social-cultural context, nepotism, and moral hazard on the shaping of non-performing loans. *Sustainable Futures*, *8*, 100279. https://doi.org/10.1016/j.sftr.2024.100279

Razali, R., Haryono, S., Abdou, O. S., Jailani, M. R., & Imamuddin, I. (2024). Revisiting the Nexus among Bank Specific Factors, Macroeconomic Factors, and Islamic Banking Performance: Three Measurement Models. *Shirkah: Journal of Economics and Business*, *10*(1), 78–96. https://doi.org/10.22515/shirkah.v10i1.748

Sururi, S., & Haryono, S. (2024). Does Diversification Affect Financing Risk in Indonesian Islamic Banks? An ARDL Approach. *Share: Jurnal Ekonomi Dan Keuangan Islam*, *13*(2), 880–905. https://doi.org/10.22373/share.v13i2.24380

Sururi, S., Kuntoro, A., Akasumbawa, M. D. D., & Putra, M. D. (2025). Determinant of Net Profit Margin in Islamic Bank: Evidence From Indonesia. *El-Kahfi: Journal Of Islamics Economics*, *6*(1), 171–182. https://doi.org/10.58958/elkahfi.v6i01.483

Tarawneh, A., Abdul-Rahman, A., Mohd Amin, S. I., & Ghazali, M. F. (2024). A Systematic Review of Fintech and Banking Profitability. *International Journal of Financial Studies*, *12*(1), 3. https://doi.org/10.3390/ijfs12010003

Tok, E., & Yesuf, A. J. (2022). Embedding Value-Based Principles in the Culture of Islamic Banks to Enhance Their Sustainability, Resilience, and Social Impact. *Sustainability*, *14*(2), 916. https://doi.org/10.3390/su14020916

Wang, C., & Lin, Y. (2021). Income diversification and bank risk in Asia Pacific. *The North American Journal of Economics and Finance*, *57*, 101448. https://doi.org/10.1016/j.najef.2021.101448