DO ISLAMIC BANKING INDICATORS AFFECT INDONESIA'S ECONOMIC GROWTH? EVIDENCE FROM THE VECM MODEL

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Abstract *: Indonesia has experienced rapid growth in the Islamic banking sector, which is expected to contribute to national economic growth. This study examines the short-run and long-run relationships between Islamic banking performance and Indonesia's economic growth proxied by Gross Domestic Product (GDP). Using quarterly data from Islamic Commercial Banks (BUS) and Islamic Business Units (UUS) during 2012–2021, this study analyzes the effects of BOPO, ROA, ROE, financing, and Non-Performing Financing (NPF) on GDP through the Vector Error Correction Model (VECM). The results show that, in the long run, BOPO, ROE, and financing have a positive and significant effect on GDP, while NPF negatively affects economic growth. Meanwhile, ROA does not significantly influence GDP. The Granger causality test indicates a one-way causal relationship from GDP to financing and ROA. These findings confirm the important role of Islamic banking intermediation and financial performance in supporting economic growth in Indonesia. This study contributes to the literature by providing empirical evidence on the dynamic relationship between Islamic banking performance and economic growth in Indonesia using the VECM approach, covering both long-run equilibrium and short-run adjustment mechanisms. The findings also provide policy implications for strengthening Islamic banking performance and financing effectiveness to support sustainable economic development.*

Keywords *:* ***Financing; Gross Domestic Product; Islamic Banking; VECM***

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1. INTRODUCTION

Indonesia hosts the largest Muslim population globally, alongside countries such as Egypt, Bangladesh, Turkey, Iran, Pakistan, and Nigeria (Muhamad & Mizerski, 2013). This demographic composition has played a pivotal role in driving the growth of Islamic banking within the country (Rizvi et al., 2020). The rising demand from Muslim consumers for financial services that comply with sharia principles has prompted the industry to adapt accordingly. In response, the government introduced the *Blueprint for Sharia Banking Development* in 2002, initiated by Bank Indonesia, as a strategic effort to foster the sector's expansion (Cahyati & Oktaviana, 2025; Nastiti & Kasri, 2019). This initiative reflects the government's commitment to strengthening the role of Islamic banking in advancing sustainable national economic growth.

Economic growth is commonly measured using the Gross Domestic Product (GDP) indicator, which serves as a central benchmark in assessing a country's economic performance. Consequently, regulators frequently rely on GDP when formulating policies at the national level. The trend of Indonesia's GDP over the past decade is presented in Figure 1 below.

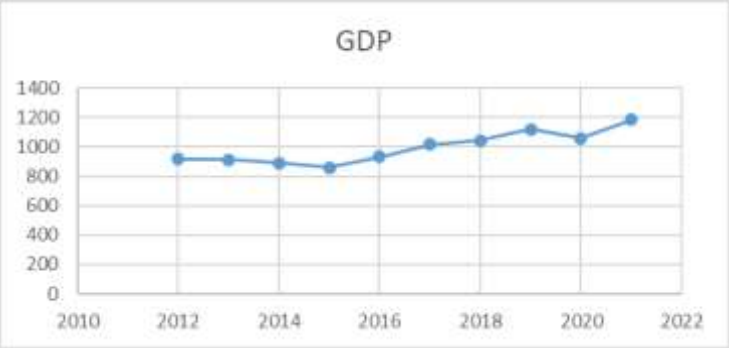

Figure 1. Development of Indonesia's GDP Value
Source: Central Bureau Agency, 2022.

As shown in Figure 1, GDP, a key indicator of national economic growth, has experienced notable annual increases, though with fluctuations. The severe shock of the Covid-19 pandemic led to a contraction in 2020; however, by 2021, the economy began to recover, reflected in the rebound of GDP values. Economic growth, as illustrated by the rise in GDP, can be attributed to multiple factors, including the strengthening performance of Islamic banking.

Islamic banking in Indonesia has continued to expand annually, despite the relatively recent emergence of the Islamic financial market (Nani, 2019). Compared to conventional banking, the development of Islamic banking remains in its formative stage (Siddique et al., 2022). Its establishment began with the founding of Bank Muamalat Indonesia in 1992, which successfully demonstrated the resilience of Islamic commercial banks during the 1998 financial crisis (Anwar et al., 2020; Marlina et al., 2021). the current and future environment, characterized by Volatility, Uncertainty, Complexity, and Ambiguity (VUCA), continues to present significant challenges for the banking sector, including Islamic banking (Kasanah et al., 2022).

Similarly, the national economy was severely affected by the Covid-19 pandemic. Nevertheless, the performance of Islamic Commercial Banks demonstrated a relatively strong level of resilience, as reflected in several financial indicators reported by the OJK in 2021. The Capital Adequacy Ratio (CAR) stood at 25.71%, while the Return on Assets (ROA) increased to 1.55% compared to 1.40% in the previous year. The Operating Expenses to Operating Income (BOPO) ratio was recorded at 83.15%, and the Non-Performing Financing (NPF) ratio remained stable at 1.37%. Despite this resilience, financing contracted by 3.93% year-on-year in 2020, largely due to the pandemic's dampening effect on business activity. By 2021, however, Islamic banking outperformed the national banking sector in several aspects. The growth of Islamic banking assets reached 13.94%, surpassing that of national banks. Similarly, the expansion of third-party funds stood at 15.3%, while financing grew by 6.9%, exceeding the 5.25% growth recorded by national banking (OJK, 2022).

The results of several recent studies suggest that there is a positive contribution of Islamic banking to economic growth. Such Majid and Kassim (2015) mentioned the significant effect of Islamic banking on economic growth in Malaysia, Bangladesh

(Chowdhury et al., 2018), Southeast Asia (Lebdaoui & Wild, 2016), Middle East (East et al, 2016), and Saudi Arabia (Jouini, 2016). However, the findings are not entirely convincing due to the discovery of research showing Islamic banking did not contribute to the growth of the economy in Turkey (Yüksel & Canöz, 2017), Malaysia (Gani & Bahari, 2021), and the United Arab Emirates (Zarrouk et al., 2017). Therefore, it is necessary to conduct further research on the contribution of Islamic banking to economic growth in Indonesia. Theoretically and empirically, the literature related to the relationship of Islamic banking and economic growth has been limited to date. Meanwhile, this needs to be considered as a regulatory step in taking the right policy.

Previous studies examining the relationship between Islamic banking and economic growth have produced mixed findings. Several studies reported that Islamic banking contributes positively to economic growth in countries such as Malaysia, Bangladesh, and several Middle Eastern countries (Majid & Kassim, 2015; Chowdhury et al., 2018; Tabash et al., 2022). However, other studies found insignificant or inconsistent relationships, particularly in Turkey, the UAE, and Malaysia (Yüksel & Canöz, 2017; Zarrouk et al., 2017). These inconsistent findings indicate that the relationship between Islamic banking performance and economic growth remains inconclusive and may differ across countries and economic conditions. In the Indonesian context, empirical evidence remains relatively limited, particularly studies that comprehensively examine both bank-specific performance indicators and financing variables simultaneously using a long-term dynamic framework.

This study addresses the gap by analyzing the dynamic relationship between Islamic banking performance and Indonesia's economic growth using quarterly data from 2012–2021. Unlike previous studies that mainly focused on financing or general Islamic finance indicators, this research incorporates BOPO, ROA, ROE, financing, and NPF as determinants of economic growth within the Vector Error Correction Model (VECM) framework. The use of VECM allows the study to capture both short-run adjustments and long-run equilibrium relationships among variables, including during periods of economic instability such as the Covid-19 pandemic.

This study contributes to the literature in several ways. First, it provides more comprehensive empirical evidence regarding the role of Islamic banking performance in influencing economic growth in Indonesia. Second, it extends previous studies by integrating profitability, efficiency, financing, and financing risk indicators into a single empirical model. Third, the findings offer practical implications for regulators and Islamic banking institutions in strengthening financial intermediation and improving banking performance to support sustainable economic growth in Indonesia.

2. LITERATURE REVIEW AND METHOD

2.1 Literature Review

This study is primarily based on the Financial Intermediation Theory, which explains the role of banks as intermediaries in channeling funds from surplus units to deficit units to stimulate investment, production, and economic growth. According to this theory, the effectiveness of banking intermediation is reflected in the bank's financial performance, including profitability, operational efficiency, financing distribution, and financing risk management. Better banking performance enables financial institutions to allocate resources more efficiently to productive sectors, thereby supporting sustainable economic growth.

In the context of Islamic banking, this study also adopts the Islamic Economic Development perspective through the Maqāṣid al-Sharī'ah framework. Islamic banking

is not only profit-oriented but also aims to achieve social welfare (falah) through justice, equitable distribution of wealth, and productive economic activities. Therefore, Islamic banking financing is expected to contribute positively to economic growth while maintaining financial stability and sustainability. Based on these theories, variables such as BOPO, ROA, ROE, financing, and NPF are theoretically associated with economic growth because they reflect the effectiveness of Islamic banking in performing its intermediation function and supporting productive economic activities.

Economic growth is generally defined as an increase in long-term per capita output. Within the Islamic economic perspective, however, *falah* or prosperity represents the ultimate goal of development. The concept of *falah* emphasizes the attainment of happiness in both worldly and spiritual dimensions, achieved through comprehensive adherence (*kaffah*) to religious commandments (Othman, 2015). The achievement of happiness in spiritual and material terms is the ultimate prosperity (Kimmitt et al., 2020). Therefore, according to religious teachings, sustainable economic development must create a balance between individuals and societies. Through the *Maqāṣid al-Sharīʻah* approach, sustainable economic development is pursued by safeguarding religion, life, intellect, progeny, and wealth (Dariah et al., 2016). In this framework, sustainable economic development is not limited to material growth but is instead directed toward achieving comprehensive benefits (*maṣlaḥah*) for the entire community (Zhang et al., 2023). Moreover, the objectives of *Maqāṣid al-Sharīʻah* share significant common ground with the United Nations' Sustainable Development Goals (SDGs). For instance, the protection of life and intellect resonates with goals related to health and education, while the safeguarding of progeny and wealth aligns with goals addressing poverty reduction, economic inclusivity, and intergenerational equity. By integrating these perspectives, Islamic economic principles offer not only a faith-based framework for sustainability but also a complementary paradigm that enriches global development discourse.

The GDP growth rate reflects real economic activity after adjusting for inflation and is closely linked to borrowing and saving behavior in society. Unlike Gross National Product (GNP), which accounts for the origin of production factors, GDP measures the total value of goods and services produced within a country's borders, regardless of whether domestic or foreign resources are used. In this study, constant-price GDP is used as the dependent variable to capture real economic growth. This approach corrects nominal GDP for price changes, making it possible to observe growth that is not influenced by inflationary effects.

Econometric time series models are structural models developed from existing economic theories. In the 1980s, Christopher A. Sims introduced the Vector Autoregression (VAR) model as an alternative approach to macroeconomic analysis. The VAR model is relatively simple, relying on a smaller set of variables, where both dependent and independent variables are represented through lags (Corlett & Aigner, 1972). Time series data often exhibit stochastic trends, indicating the presence of both long-run and short-run components. Building on this, Engle and Granger (1987) developed the concepts of cointegration and error correction, which were later extended by Johansen and Juselius (1990) into the Vector Error Correction Model (VECM) framework (Shao et al., 2021). The VECM approach provides a systematic procedure to distinguish between long-term equilibrium relationships and short-term dynamics (Lütkepohl, 2005; Lütkepohl, 2013).

The VECM method has been widely applied across various fields to examine long-run relationships between variables, including economics (Panagiotidis & Printzis,

2016), technology (Danish et al., 2018), environment (Shao et al., 2019), foods (Koondhar et al., 2021), and so on. The VECM model effectively looks at the long-term relationship between the dependent and independent variables. In line with this, the present study applies the VECM framework to analyze the long-run relationship between Islamic banking performance indicators, namely BOPO, ROA, ROE, financing, NPF, and economic growth, represented by GDP.

Profitability serves as a key measure of bank performance, reflecting its ability to generate earnings over a given period relative to sales, assets, or equity capital. In the banking sector, profitability is most commonly assessed using the Return on Assets (ROA) ratio, which compares net income to total assets (Curak et al., 2012). Banks' profitability level is usually calculated using the Return on Asset (ROA) ratio, which compares net income and total assets. ROA reflects the ability of bank management to generate profits from bank assets. ROA is also defined as net profit divided by total assets, whose results are expressed by the following percentages:

$$ROA = \frac{\text{Profit After Tax}}{\text{Total Asset}} \text{---------- (1)}$$

ROE is a ratio used to measure whether a company has succeeded in generating profit for its shareholders. ROE is considered to represent shareholders' net worth or company value. In the banking sector, ROE is positively associated with stock prices. A higher ROE indicates stronger returns for investors, which tends to increase investor interest in purchasing shares. This heightened demand can subsequently drive bank stock prices upward (Pennacchi & Santos, 2021). ROE is calculated by:

$$ROE = \frac{\text{Profit After Tax}}{\text{Shareholder Equity}} \text{---------- (2)}$$

It assesses how a country's economic growth is inseparable from the banking sector's role, especially in financing (Nastiti & Kasri, 2019). The real sector will need funds to support investment to accelerate a country's economic growth (Boussaada & Hakimi, 2021). The fundamental principles used in Islamic banking are the expectation of Usury, oriented towards Profit Sharing, collecting, and providing financing. Islamic financing is divided into two classifications based on how it operates: *Al-Ba'i* (buying and selling) and *Asy-Syirkah* (cooperation).

The most basic banking risk in carrying out the intermediation function is credit risk (Gomez-Gonzalez et al., 2020), which in Islamic banking terms, is often referred to as financing risk. Credit risk is a bank loss that occurs when the borrower customer (debtor) or customer who receives financing cannot pay their obligations to the bank. Indicators often used in measuring the level of credit risk are the ratio of Non-Performing Loans (NPL) in conventional banks or Non-Performing Financing (NPF) in Islamic banks. Non-Performing Financing (NPF) includes credit where the borrower cannot carry out the terms of the credit agreement he has agreed to, which is caused by various things, so it needs to be reviewed or amended the agreement. Thus, there is still a possibility that credit risk may increase. The level of cost control and financing/credit policies implemented by banks is reflected by the size of the NPF. The Non-Performing Financing (NPF) ratio is as follows:

$$NPF = \frac{\text{Total Non}-\text{Performing Financing}}{\text{Total Financing}} \text{ x } 100\% \text{ ---------- (3)}$$

2.2 Hypothesis Development

Financial Intermediation Theory explains that banks play an important role in mobilizing funds and distributing financing to productive sectors to encourage economic growth. In the context of Islamic banking, the effectiveness of this intermediation function is reflected in profitability, operational efficiency, financing activities, and financing risk management. Supported by the Maqāṣid al-Sharī'ah perspective, Islamic banking is expected to contribute not only to profitability but also to sustainable economic welfare through productive and ethical financing activities.

Operational efficiency, measured by the BOPO ratio, reflects the bank's ability to manage operational costs efficiently. According to Financial Intermediation Theory, efficient banking operations improve the bank's ability to channel financing effectively to productive sectors, thereby stimulating economic activity and economic growth (Christaria & Kurnia, 2016). Any increase in operating costs, not offset by banking operating income, will result in reduced banking profits (Dutta & Saha, 2021) so that banks with high-efficiency value have a greater ability to channel financing to customers. A country with good financial sector development will encourage high economic expansion (Yiadom et al., 2022). The higher financing disbursed by banks will increase growth so that the financing disbursed can increase economic growth (Zhang & Wellalage, 2022). So that BOPO for economic growth is positively related.
H1. *BOPO has a positive and significant effect on the GDP*

Profitability measured by Return on Assets (ROA) reflects the bank's ability to generate profits from its assets. A higher ROA indicates better financial performance and stronger intermediation capacity, enabling Islamic banks to expand financing activities to productive sectors. Based on Financial Intermediation Theory, improved profitability supports economic expansion through increased financing and investment activities. Empirical studies also confirm the relationship between banking profitability and economic growth (Birru, 2016). Several studies have proven a significant relationship between ROA and financing provided by banks (Shawtari, 2018). The ability of banks to generate profits from invested capital will increase financing, which is channeled to customers, thereby increasing economic growth. As research conducted by Hasan (2022), every increase in banking profits illustrates an increase in financing and economic activity so that it can encourage economic growth. So that ROA for economic growth is positively related.
H2*. ROA has a positive and significant effect on the GDP*

Return on Equity (ROE) measures the bank's ability to generate profits from shareholders' equity. A high ROE indicates efficient capital utilization and stronger financial capacity to support financing distribution. From the Islamic economic perspective, stronger bank profitability enhances the ability of Islamic banks to support productive economic activities and social welfare (Yildiz et al., 2020). Supriyanto (2014) research revealed a significant influence between ROE and banking profit growth. That will increase customer financing, increasing economic growth so that ROE has a positive relationship with economic growth.
H3. *ROE has a positive and significant effect on GDP*

Financing represents the core intermediation function of Islamic banking in channeling funds to productive economic sectors, particularly MSMEs. Financial Intermediation Theory states that financing activities increase investment, business expansion, and economic productivity, which ultimately contribute to economic

growth. In Islamic banking, financing activities are also aligned with Maqāṣid al-Sharīʻah principles by promoting equitable and productive economic activities (Jelonek et al., 2020). In various empirical studies, the banking sector is essential in mediating capital flows from unit surplus to unit deficits through various forms of credit and business sector financing. Islamic bank financing is the number of funds disbursed to customers using various financing schemes following sharia contracts (Bakhouche et al., 2022). Several studies have been conducted to see the effect of Islamic banking financing on economic growth, including research conducted by Disli et al. (2022); Islamic banking financing in the form of work models, investment, and consumption has proven to have a significant positive effect on regional economic growth. In addition, Anwar et al. (2020) also agree. Thus, Islamic banks as intermediation institutions are essential in encouraging economic growth by financing the productive business sector.

H4. *Financing has a positive and significant effect on the GDP*

Non-Performing Financing (NPF) reflects financing risk and indicates the quality of financing distribution. High NPF weakens banking stability and reduces the ability of banks to distribute financing effectively. According to Financial Intermediation Theory, inefficient risk management disrupts the intermediation process and negatively affects economic growth (Rizvi et al., 2020). Research that has been carried out to see how NPF affects economic growth includes research conducted by Staehr and Uusküla (2021) which examines banking in European Union countries. Macro-financial indicators for non-performing loans significantly negatively impact financing, impacting economic growth. The research conducted by Haffar & Le Fur (2021) on the relationship of NPF to macroeconomic conditions. NPF causes a decrease in the ratio of providing capital to customers. Meanwhile, capital is the biggest problem business customers face, further hindering economic growth. So that NPF affects economic growth.

H5. *NPF has a positive and significant effect on the GDP*

2.3 METHODOLOGY

2.3.1 Data

This research population and sample are all Islamic banks in Indonesia that have been registered in OJK, which consists of 12 Sharia Commercial Banks and 20 Sharia Business Units. The data used in this study are secondary from 2012-2021. The data for economic growth variables are taken from the official BPS website, while BOPO, ROA, ROE, financing, and NPF is taken from the official OJK report.

The data analysis technique in this study is the Vector Error Correction Model (VECM) Technique. This technique is considered a type of inference analysis method, starting with conducting a unit root test (Unit Root Test), which aims to see whether the data used is stationary and where the stationary level is (level, first difference, or second difference).

2.3.2 Model Development

In this study, the models to be identified are six variable models that hypothesize that BOPO, ROA, ROE, Financing, and NPF are functions of GDP. GDP represents the economic growth of a country. BOPO is the ratio between total operating expenses and total operating income. Meanwhile, ROA measures the overall effectiveness of assets in generating profit through available assets and the power to create profits from invested capital. ROE shows the company's ability to generate a net profit using its

capital. The financing in this study is the financing provided to MSMEs, and the NPF is the ratio used to measure the failure of financing. A summary of the operational variables in this study is shown in Table 1 below:

Table 1 Summary of Operational Variables

Type of Variable	Name	Variable Definition	Hypothesis (Expected Sign)	Source of Data
Dependent	GDP	GDP is the sum of all value-added from all business units in a country.	BOPO, ROA, ROE, Financing, and NPF influence GDP	Quarterly Published Financial Reports from the BPS
Independent	Bank's specific variables			
	BOPO	Operational costs/operational income (%)	BOPO (-)	Quarterly Published Financial Reports from the Financial Services Authority
	Return on Asset	Profit before tax/Average Total Asset (%)	ROA (+)	
	Return on Equity	Net profit after tax/Equity (%)	ROA (+)	
	Financing	Financing for MSMEs	Financing (+)	
	Non-Performing Financing	Non-performing financing/total financing x100% (%)	NPF (+)	

Source: various references, 2022

The stationarity test is a test conducted on time series data to find out whether the time series data is stationary or not.

$$Y_t = \alpha + \beta X_t + \varepsilon_t \quad (3)$$

Time series stationarity is a statistical characteristic of the average and its variance over time. If both are constant over time, then the series is said to be stationary. Otherwise, the series is described as a non-stationary process.

X level	X_t	
X1st difference value	$X_t - X_{t-1}$	(4)
X2nd difference value	$X_t - X_{t-2}$	

Next, the determination of the Optimal LAG. Optimum LAG is a way to choose how much to use in this study before conducting a VECM test. So selecting the optimum number of LAG is necessary to obtain somewhat promising results. Then it is required to apply the Johansen Cointegration Test. The cointegration test is one method to see the extent of the balanced relationship between economic variables in the long term.

$$LR_{max}\left(\frac{r}{n}+1\right) = -T^{*}\log(1-\lambda) \quad (5)$$

Where λ is the Maximum Eigenvalue and T sample in the study, N is the sum of the variables in the model for r = 0,1,2... N-1. Estimating the VECM model shows the long-term and short-term relationships between one variable and another. The VECM regression model is:

$$Y_t = a_1 + p_1 e_1 + \sum_{i=0}^{n} \beta i\, Y_{t-i} + \sum_{i=0}^{n} \delta i\, X_{t-i} + \sum_{i=0}^{n} Yi\, Z_{t-1} \quad (6)$$

$$X_t = a_2 + p_2 e_2 + \sum_{i=0}^{n} \beta i\, Y_{t-i} + \sum_{i=0}^{n} \delta i\, X_{t-i} + \sum_{i=0}^{n} Yi\, Z_{t-1} \quad (7)$$

In VECM, the cointegration rating indicates the number of cointegration vectors. A negative and significant ECM coefficient (i.e., et-1 in the equation above) suggests that any short-term fluctuations between independent and dependent variables result in a stable long-term relationship between the variables. In addition, the Granger causality test in the context of two variables (X, Y) can be constructed as follows:

$$Yt = \alpha 0 + \alpha 1Yt\text{-}1 + \ldots\ldots + \alpha iYt\text{-}I + \beta 1Xt\text{-}1 + \ldots\ldots \beta 1Xt + \mu \quad (8)$$

$$Xt = \alpha 0 + \alpha 1Xt\text{-}1 + \ldots\ldots + \alpha iXt\text{-}I + \beta 1Yt\text{-}1 + \ldots\ldots \beta 1Yt + \mu \quad (9)$$

In models, μ is a white noise error. The constant parameter 0 represents the continuous growth rate Y in the formula. Therefore, the trend of these variables can be interpreted as the cointegration between X and Y following the unit of the root processes. Unidirectional causality will occur between two variables if one of the null hypotheses is rejected. There is bidirectional causation if both null hypotheses are rejected and no causation if the null hypotheses are rejected.

3. RESULTS AND ANALYSIS

3.1 Results

Before testing the relationship between variables, it is necessary to apply several tests to determine the best estimation model, such as the unit root, optimal lag, and stability tests. As the stationary test results are shown in Table 2 below:

Table 2 Stationary Test

Variable	Probability	First Difference Stationary Test Results
GDP	0.0049	P < 0.05 (Read stationary on First Difference)
BOPO	0.0041	P < 0.05 (Read stationary on First Difference)
ROA	0.0000	P < 0.05 (Read stationary on First Difference)
ROE	0.0000	P < 0.05 (Read stationary on First Difference)
Financing	0.0000	P < 0.05 (Read stationary on First Difference)
NPF	0.0000	P < 0.05 (Read stationary on First Difference)

Source: secondary data processed, 2022

In Table 2, it is proved that all variables are stationary at the first difference, where the results show that the probability value for all variables is below the value of 5%.

Table 3 Determination of the Optimal LAG

Lag	LogL	LR	FPE	AIC	SC	HQ
0	37.93145	NA	7.17e-09	-1.726024	-1.464794	-1.633929
1	188.0295	243.4022*	1.55e-11*	-7.893485*	-6.064876*	-7.248815
2	230.7501	55.42138	1.26e-11	-8.256763	-4.860774	-7.059518
3	291.3863	58.99732	5.28e-12	-9.588446	-4.625077	-7.838626*

Source: secondary data processed, 2022

Based on the results of the optimal lag test in table 3 above, it is known that the first lag is selected as the optimal lag.

Table 4 Johansen Cointegration Test

Unrestricted Cointegration Rank Test (Trace)		
Hypothesized	Trace	0.05

No. of CE(s)	Eigenvalue	Statistic	Critical Value	Prob.**
None *	0.881850	194.3869	83.93712	0.0000
At most 1 *	0.810501	117.4981	60.06141	0.0000
At most 2 *	0.552751	57.61681	40.17493	0.0004
At most 3 *	0.454067	28.64974	24.27596	0.0132
At most 4	0.168724	6.860433	12.32090	0.3392
At most 5	0.005757	0.207849	4.129906	0.7047

Source: secondary data processed, 2022

Based on the results of Johansen's cointegration test in the table above, it is known that the probability values in the None row and the at most 1, At most 2, and at most 3 lines are 0.0000, 0.0000, 0.0004 and 0.0132, respectively, which is < 0.05. That means there is a cointegration equation, meaning it has a long-term equilibrium.

Table 5 Vector Error Correction Model (VECM) Model

Cointegrating Eq:	CointEq1
GDP (-1)	1.000000
BOPO (-1)	1.919368
	(0.32502)
	[5.90530]
ROA (-1)	-0.356891
	(0.38854)
	[-0.91855]
ROE (-1)	1.325736
	(0.21268)
	[2.53160]
Financing (-1)	0.620669
	(0.09359)
	[6.63186]
NPF (-1)	1.648744
	(0.31240)
	[5.27762]

Error Correction:	D(GDP)	D(BOPO)	D(ROA)	D(ROE)	D(Financing)	D(NPF)
CointEq1	-0.010875	-0.006994	-0.075663	-0.136153	-2.170647	-0.155206
	(0.10044)	(0.01333)	(0.08072)	(0.13459)	(0.42866)	(0.04917)
	[-0.10827]	[-0.52458]	[-0.93731]	[-1.01159]	[-5.06385]	[-3.15633]
D(GDP(-1))	-0.746668	-0.114477	0.696081	0.261320	1.572442	-0.093713
	(0.19835)	(0.02633)	(0.15941)	(0.26580)	(0.84652)	(0.09711)
	[-3.76434]	[-4.34802]	[4.36648]	[0.98315]	[1.85755]	[-0.96504]
D(BOPO(-1))	-1.084283	0.310514	0.194236	2.174267	-15.12814	-1.728369
	(1.08086)	(0.14347)	(0.86868)	(1.44838)	(4.61281)	(0.52916)
	[-1.00316]	[2.46434]	[0.22360]	[1.50117]	[-3.27959]	[-3.26627]
D(ROA(-1))	-0.593685	0.013924	0.365503	0.858297	-1.759703	-0.148670
	(0.23636)	(0.03137)	(0.18996)	(0.31672)	(1.00870)	(0.11571)
	[-2.51183]	[0.44382]	[2.92414]	[2.70994]	[-1.74453]	[-1.28483]
D(ROE(-1))	0.104280	-0.023010	0.080399	-0.212442	1.295688	-0.172906
	(0.16054)	(0.02131)	(0.12903)	(0.21513)	(0.68515)	(0.07860)
	[0.64955]	[-1.07981]	[0.62312]	[-0.98750]	[1.89110]	[-2.19991]
D(Financing (-1))	0.051364	-0.011068	-0.107151	-0.127801	0.408040	-0.025362
	(0.04407)	(0.00585)	(0.03542)	(0.05905)	(0.18806)	(0.02157)
	[1.16561]	[-1.89224]	[-3.02554]	[-2.16430]	[2.6972]	[-1.17561]
D(NPF(-1))	0.304526	0.088423	0.020067	-0.354402	-0.960139	0.708556

	(0.29994) [1.01529]	(0.03981) [2.22099]	(0.24106) [0.08325]	(0.40193) [-0.88176]	(1.28005) [-0.75008]	(0.14684) [4.82534]
R-squared	0.363890	0.695985	0.706349	0.527536	0.781056	0.737424
Adj. R-squared	0.240772	0.637144	0.649513	0.436091	0.738680	0.686602
Sum sq. resids	0.762084	0.013427	0.492243	1.368448	13.88014	0.182655
S.E. equation	0.156791	0.020812	0.126011	0.210104	0.669139	0.076760
F-statistic	2.955618	11.82813	12.42789	5.768900	18.43143	14.51015
Log likelihood	20.35676	97.09388	28.66133	9.234601	-34.78424	47.49747
Akaike AIC	-0.702987	-4.741783	-1.140070	-0.117611	2.199171	-2.131446
Schwarz SC	-0.401327	-4.440123	-0.838410	0.184050	2.500831	-1.829785
Mean dependent	0.010225	0.003727	-0.001680	-0.005900	-0.076808	0.026218
S.D. dependent	0.179943	0.034549	0.212850	0.279788	1.308969	0.137116

Source: secondary data processed, 2022

Based on the results of the VECM model in the table above, the following interpretation can be carried out: In the short term, the change in BOPO during the last quarter significantly affected BOPO in the current quarter with a statistical value of t 2.46434 > critical value t 2.022691. If the BOPO in Q1 increased by 1 percent, it would cause the current GDP change to increase by 0.310514 percent. In the short term, the change in ROA during Q1 ago significantly affected the current quarter with a statistical value of t 2.92414 > critical value t 2.022691. If the ROA during Q1 increases by 1 percent, it will cause a change in GDP to increase by 0.365503 percent. In the short term, the difference in ROE during Q1 ago, did not affect the ROE in the current quarter with a statistical value of t 0.98750 < critical value t 2.022691. If the ROE in Q1 increases by 1 percent, it will cause the current GDP change to fall by 0.212442 percent. In the short term, changes in financing during Q1 affected financing in the current quarter with a statistical value of t 2.6972 > critical value t 2.022691. If financing during the last Q1 increased by 1 percent, it would cause a change in GDP at this time to increase by 0.408040 percent. In the short term, the difference in NPF during Q1 affected the current quarter with a statistical value of t 4.82534 > critical value t 2.022691. If the NPF during Q1 is 1 percent, it will cause the current GPD change to increase by 0.708556.

In the long run, BOPO significantly affects GDP with a statistical value of t |5.90530| > critical value t 2.022691. In the long run, ROA has no significant effect on GDP with a statistical value of t -0.91855 < critical value t 2.022691. In the long run, ROE significantly affects GDP with a statistical value of t 2.53160 > a critical value of t 2.022691. In the long run, financing significantly affects GDP with a statistical value of t 6.63186 > critical value t 2.022691. In the long run, NPF significantly affects GDP with a statistical value of t 5.27762 > critical value t 2.022691.

Table 6 Granger Causality Test

Null Hypothesis:	Obs	F-Statistic	Prob.
BOPO does not Granger Cause GDP	39	6.45941	0.0155
GDP does not Granger Cause BOPO		0.00276	0.9584
ROA does not Granger Cause GDP	39	0.23124	0.6335
GDP does not Granger Cause ROA		7.84247	0.0082
ROE does not Granger Cause GDP	39	0.00217	0.9631
GDP does not Granger Cause ROE		0.16878	0.6836
FINANCING does not Granger Cause GDP	39	1.90153	0.1764
GDP does not Granger Cause FINANCING		5.44584	0.0253
NPF does not Granger Cause GDP	39	8.02028	0.0075

GDP does not Granger Cause NPF	0.03693	0.0487

Source: secondary data processed, 2022

Based on the results of the Granger Causality test in the table above, it is known that BOPO has a significant effect on GDP, with a probability value of 0.0155 < 0.05, and also GDP does not significantly affect BOPO with a probability value of 0.9584 > 0.05. It can be assumed there is a directional causality between BOPO and GDP, namely BOPO, which affects GDP. ROA has no significant effect on GDP with a probability value of 0.6335 > 0.05, and GDP has a significant impact on ROA with a probability value of 0.0082 < 0.05. Therefore, it is confirmed there is a causality in one direction between ROA and GDP, namely GDP, which affects ROA. It is known that ROE does not have a significant effect on GDP with a probability value of 0.6335 > 0.05, and also GDP does not have a significant impact on ROE with a probability value of 0.6836 > 0.05. It is assumed no bidirectional causality between ROE and GDP. Meanwhile, financing does not have a significant effect on GDP with a probability value of 0.1764 > 0.05, and also GDP has a significant impact on financing with a probability value of 0.0253 < 0.05. It is assumed there is a causality in one direction between financing and GDP; namely, GDP significantly affects financing. Meanwhile, NPF has a significant effect on GDP with a probability value of 0.0075 < 0.05, and also GDP has a significant impact on NPF with a probability value of 0.0487 < 0.05. So, it is confirmed no bidirectional causality between NPF and GDP.

The IRF showed from the beginning till the 14th period, the financing response fluctuated significantly due to the GDP shock. Furthermore, after the 14th period, the fluctuations begin to shrink. In other words, the chart shows stability, as below:

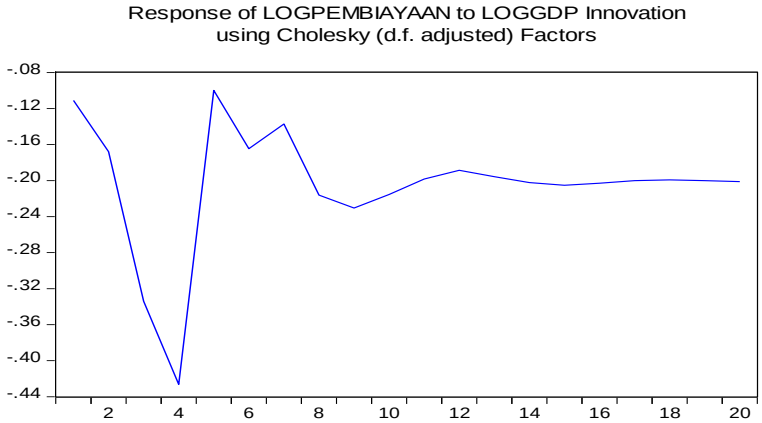

Figure 2 Impulse Response Function (IRF)
Source: secondary data processed, 2022

Table 7 Varian Decomposition

Period	S.E.	GDP	BOPO	ROA	ROE	Financing	NPF
1	0.156791	100.0000	0.000000	0.000000	0.000000	0.000000	0.000000
2	0.182736	88.55737	0.738499	7.469397	0.411957	1.693825	1.128952
3	0.207516	88.18623	0.574740	8.460063	0.325804	1.463225	0.989941
4	0.224406	86.76174	0.741014	9.125629	0.776163	1.418860	1.176592
5	0.237590	86.61924	0.764566	8.922494	0.939859	1.306907	1.446937
6	0.252928	87.09590	0.793136	8.411881	1.003861	1.245703	1.449514
7	0.267597	87.27927	0.788728	8.294773	1.047629	1.248299	1.341305
8	0.282278	87.38070	0.776004	8.280664	1.052449	1.253314	1.256869

9	0.295538	87.29563	0.774505	8.364091	1.095287	1.252440	1.218049
10	0.307868	87.27306	0.776932	8.360992	1.133820	1.235917	1.219274
11	0.319651	87.29513	0.781906	8.312034	1.171038	1.220587	1.219301
12	0.331156	87.34650	0.783810	8.257410	1.195708	1.210062	1.206508
13	0.342426	87.38745	0.783846	8.223847	1.213521	1.204690	1.186649
14	0.353348	87.40589	0.783376	8.211174	1.229549	1.200856	1.169151
15	0.363893	87.41452	0.783512	8.202626	1.245422	1.196282	1.157635
16	0.374091	87.42342	0.784229	8.190314	1.260949	1.191109	1.149979
17	0.384014	87.43690	0.784982	8.174140	1.274717	1.186191	1.143071
18	0.393706	87.45166	0.785489	8.158632	1.286566	1.182132	1.135521
19	0.403180	87.46446	0.785759	8.146214	1.296920	1.178807	1.127843
20	0.412439	87.47442	0.785970	8.136481	1.306395	1.175852	1.120887

Source: secondary data processed, 2022

Based on the test results on the decomposition variant, the increasing period shows that almost all independent variables have strengthened in affecting GDP, except for financing variables and NPF remains volatile.

Table 8 Hypothesis Test

Hypothesis	Variable Relationships	t-statistic	p-value	Information
H1	BOPO ➔ GDP	5.90530	1.919368	**Accepted**
H2	ROA ➔ GDP	-0.91855	-0.356891	**Rejected**
H3	ROE ➔ GDP	2.53160	1.325736	**Accepted**
H4	Financing ➔ GDP	6.63186	0.620669	**Accepted**
H5	NPF ➔ GDP	-5.27762	-1.648744	**Accepted**

Source: secondary data processed, 2022

Table 8 shows that BOPO has a significant effect on economic growth with a t-statistic of 5.90530 and a p-value of 1.919368, so it is stated that H1 is accepted. However, ROA has no significant impact on economic growth with t-statistics of -0.91855 and p-value of -0.356891, indicating that H2 is rejected. Furthermore, ROE has a significant effect on economic development with a t-statistic of 2.53160 and a p-value of 1.325736, so it is stated that H3 is accepted. In addition, financing significantly affects economic growth with a t-statistic of 6.63186 and a p-value of 0.620669, indicating that H4 is accepted. Meanwhile, NPF has a significant negative influence on economic growth with t-statistics -5.27762 and p-value 1.648744, so it is stated that H5 is accepted.

3.2 Discussion

The findings of this study generally support the Financial Intermediation Theory, which explains that banking institutions contribute to economic growth through their intermediation role in mobilizing and allocating funds to productive sectors. In the context of Islamic banking, this role is strengthened by the principles of Maqāṣid al-Sharīʻah, which emphasize productive financing, financial stability, and social welfare as foundations for sustainable economic development.

The results show that BOPO has a significant effect on GDP. This finding indicates that the operational efficiency of Islamic banking plays an important role in supporting economic growth. Efficient banking operations enable Islamic banks to optimize financing distribution and improve financial intermediation activities. This result is

consistent with the findings of (Nastiti & Kasri, 2019). The other previous findings include (Mehzabin, Shahriar, Hoque, Wanke, & Azad, 2022).

Meanwhile, ROA does not significantly affect economic growth. This finding suggests that profitability generated from asset utilization has not been fully translated into broader economic expansion. From the Financial Intermediation Theory perspective, profitability should strengthen financing capacity; however, during periods of economic uncertainty, particularly after the Covid-19 pandemic, Islamic banks tended to maintain prudential policies and limit financing expansion. This result supports (Ledhem & Mekidiche, 2020) who found that profitability indicators do not always directly contribute to economic growth under unstable economic conditions.

Furthermore, ROE has a positive and significant effect on GDP. This result confirms that stronger capital profitability improves the financial capacity of Islamic banks in performing their intermediation role. Higher returns on equity increase banking confidence and support financing expansion to productive sectors. This finding is in line with (Growe et al, 2014; Tabash, 2019), which found that banking profitability positively contributes to economic growth. In addition, it is also in line with Ledhem and Mekidiche (2020) findings, which confirm that profitability through ROE contributes significantly to the GDP of several countries, such as Malaysia, Brunei, Turkey, and Saudi Arabia.

Financing also has a significant positive effect on economic growth. This finding strongly supports Financial Intermediation Theory, which emphasizes that financing activities stimulate investment, production, and economic productivity. In Indonesia, Islamic bank financing is largely directed toward MSMEs, which are among the largest contributors to national GDP. Therefore, increased financing distribution encourages business expansion and economic activity (Gani & Bahari, 2021b). Similarly, as emphasized by Boukhatem and Moussa (2018) and Tabash et al. (2022) regarding the importance of financing issued by Islamic banks to affect economic growth proxied by GDP.

On the other hand, NPF has a significant negative effect on GDP. High financing risk weakens banking stability and reduces the ability of Islamic banks to distribute financing effectively. According to Financial Intermediation Theory, inefficient risk management disrupts the intermediation process and limits productive financing activities (Priyadi et al., 2021).

The findings of this study provide several important implications. Theoretically, this study strengthens the relevance of Financial Intermediation Theory and the Islamic economic development perspective in explaining the relationship between Islamic banking performance and economic growth. Practically, the findings imply that Islamic banks need to improve operational efficiency, strengthen financing quality, and expand productive financing, particularly for MSMEs, to maximize their contribution to economic growth. From a policy perspective, regulators should encourage policies that support the stability and effectiveness of Islamic banking intermediation, including improving financing quality and strengthening the resilience of Islamic banking institutions to support sustainable economic development in Indonesia.

4. CONCLUSION

This study examines the relationship between Islamic banking performance and economic growth in Indonesia using the VECM approach with quarterly data from 2012–2021. The findings reveal that, in the long run, BOPO, ROE, and financing positively and significantly affect GDP, while NPF has a significant negative effect. ROA

does not significantly influence economic growth. In addition, a one-way causal relationship from GDP to financing and ROA suggests that economic growth stimulates the expansion of Islamic banking activities.

These findings confirm the role of Islamic banking as a financial intermediary in promoting economic growth through productive financing, profitability, operational efficiency, and financing quality. The study provides empirical support for Financial Intermediation Theory and the Islamic economic development perspective by demonstrating the importance of bank-specific performance indicators in explaining economic growth within a dynamic VECM framework. From a policy perspective, regulators and Islamic banks should strengthen financing quality, improve operational efficiency, and expand productive financing, particularly for MSMEs, to enhance the contribution of Islamic banking to sustainable economic growth.

This study is limited by its focus on Indonesia and the use of a limited set of macroeconomic variables. Future studies may incorporate additional macroeconomic indicators, conduct cross-country comparisons, or employ alternative econometric approaches to provide more comprehensive evidence on the contribution of Islamic banking to economic growth.

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