Asian Journal of Islamic Management (AJIM)
2023, 5(2), 155-172

Integration of financing and macroeconomic shock in Islamic banking in Indonesia

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Article Info

Article History
Received : 2023-12-27
Revised : 2024-01-13
Accepted : 2024-01-24
Published : 2024-01-24

Keywords:
Financing, Islamic banking, macro, VECM.

DOI:
https://doi.org/10.20885/AJIM.vol5.iss2.art6

JEL Classification:
G21, G32,

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Paper type:
Research paper

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Abstract

Purpose – This study analyzes the relationship between Islamic banking financing and macroeconomic variables as well as its response to key economic variables.

Methodology – The research design uses quantitative analysis with Islamic banking panel data for the period 2019-2022 with monthly data, and the study used the Vector Error Correction Model (VECM).

Findings – Non Performing Financing (NPF) and Inflation negatively impact Islamic banking financing. Meanwhile, Third Party Funds (Dana Pihak Ketiga, DPK), Net Operating Margin (NOM), Return on Assets (ROA), Equivalent Rate of Musyarakah (ERPMUSY), and BI rates have a positive direction of significance for Islamic banking financing. In the Granger causality test, the interaction between the variables was unidirectional. While Islamic banking financing responds to shocks, many financings respond negatively to the shocks that occur.

Implications – Islamic Financing responds significantly in a negative direction as a result of the shocks that occur in each variable and based on long-term estimates. Therefore, Islamic banking needs to supervise and resolve the internal influence of each bank, as well as the macro influence that can be felt in the long term on Islamic banking financing.

Originality – This research integrates Islamic banking finance in Indonesia and examines how internal and macro variables can influence the financing disbursed to Islamic banking in Indonesia. This study also examines shocks between variables and tests the Granger causality between variables. Islamic banking needs to pay attention to many factors to minimize bad financing or lack of interest in applying for financing.

Cite this article:
Rahmayanti, D., Batin, M. H., Suryati, S., Ariyani, D., & Ifada, K. (2023), Integration of financing and macroeconomic shock in Islamic banking in Indonesia, *Asian Journal of Islamic Management*, 5(2), 155-172. https://doi.org/10.20885/AJIM.vol5.iss2.art6

Introduction

Islamic Banking is an intermediary institution. One of the most important aspects of banking is how banks channel funds that have been collected and distribute them to the community. Fund distribution in Islamic banks emphasizes risk-sharing to ensure fairness in the financial system (Chapra, 1992). Applying Islamic financial principles reduces risk and ensures financial stability. The

P ISSN 2746-0037 | E ISSN 2722-2330

aim of distributing financing by Islamic banking to the community is to support the implementation of development, increasing justice, togetherness, and equal distribution of community welfare (Majeed & Zainab, 2017).

The public's need for financing services from Islamic banking is among other Islamic banks that do not use interest sharing but profit sharing. Islamic banking in Indonesia offers many products and services for financing, including *ijarah*, *musyarakah*, *mudharabah*, and *murabahah* contracts. Islamic banking in Indonesia provides solutions for business actors that can impact economic growth by expanding businesses, creating jobs, and increasing production to generate more income.

The increase or decrease in financing channeled by Islamic banking is influenced by various internal and external factors, as the diagram below shows financing based on the contract used.

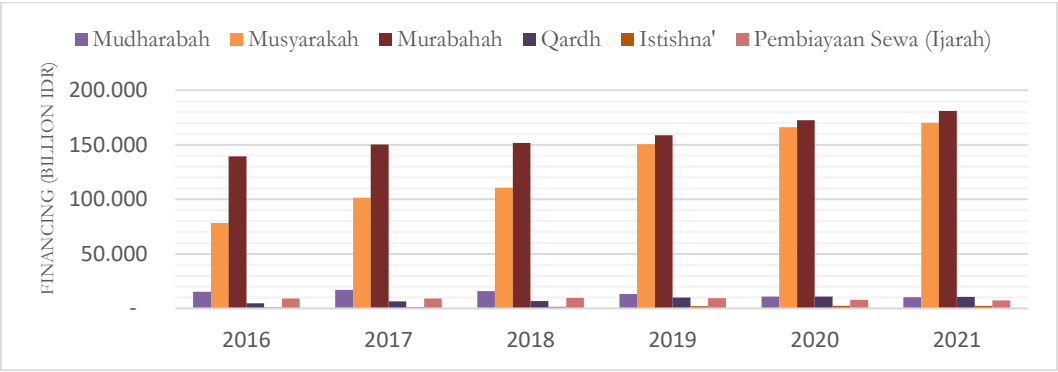

Figure 1. Financing BUS and UUS

From Figure 1, the financing distributed by Islamic Commercial Banks and Islamic Business Units based on the type of contract from 2016 to 2021 shows an increase, and the contracts used are dominated by financing using *murabahah* contracts, followed by *musyarakah* and *mudharabah* contracts. However, customers who use ijarah, istishna, and Qardh, and *mudharabah* contracts still tend to be very few. Looking at the data for 2019-2021 during the Covid-19 period, financing distribution continued to increase, but the data did not increase significantly. Communities use *musyarakah* contracts for business financing, in which capital comes from both parties. That is, people who obtain Financing from Islamic banking already have an ongoing business and sufficient capital, so they intend to expand their business. Under the conditions in this *musyarakah* contract, the returns made by the customer tend to be smooth. Hence, the risk related to bad loans that the bank receives is very small because the customer already has ongoing business and sufficient capital.

Islamic banking carries out financial intermediation through disbursed financing, where the growth of assets in an institution, namely, Islamic banking, affects the total financing distributed by Islamic banking. Data obtained during the observation period 2019-2022 shows an annual increase, with total Islamic banking assets for 2019-2021 being IDR 350.364, IDR 397.073, and IDR 441.789 billion. With the high value of bank assets, it will be increasingly able to improve the capital structure to guarantee the risk of placing productive assets, one of which is the provision of credit or financing. This is supported by the fact that banks' total assets have a significantly positive effect on the volume of profit-sharing-based Financing in Islamic commercial banks in Indonesia (Kurniawanti, 2014).

The growth of DPK demonstrates the performance of Islamic banking in terms of its ability to raise funds. This shows that the performance of Islamic banking influences the financing channeled by Islamic banking (Pradesyah & Triandhini, 2021). The assessment of the performance of Islamic banking can also be seen in the ability of bank liquidity or the level of bank profitability, which is reflected in Islamic banking financial ratios. This is supported by research results revealing that DPK have a significant positive effect on financing (Khotmi et al., 2021; Mughits & Wulandari, 2016; Hermuningsih et al., 2020). DPK are suspected to have a significant positive effect on financing because, as seen from existing data, financing continues to increase. In addition, DPK are collected from the public in the form of savings, time deposits, and other demand

deposits, so they must be balanced with the distribution of financing carried out by each bank, along with increasing DPK; financing will increase, which will ultimately increase profits, and will be accepted by the bank (Astarini *et al*., 2016). However, banks now have increased access to money markets to fund their liquidity through financial and non-financial institutions (Jin et al., 2018).

Furthermore, NOM is commonly used to determine how a bank's management can manage its productive assets to obtain profit-sharing income. Bank efficiency determines the financing growth. The more efficient a bank, the greater its impact on financing (Suryanto & Susanti, 2020). This income is obtained by reducing Operating Income with profit-sharing funds after deducting the operational costs. When NOM increases, Islamic banking financing will also increase. The results reveal that NOM positively affects financing (Farianti et al., 2020).

Liquidity and capital adequacy are important because they are a source of risk for commercial banks and investors (González & Keddad, 2024). To measure bank liquidity in this research, the FDR is used. The financial intermediation measure focuses on the banking part of financial intermediation and measures whether the financial system is successful in converting (bank) deposits into loans subject to eligibility constraints imposed on banking and securities markets (Boďa & Zimková, 2021). In this case, the researcher used a Islamic bank, so the measurement used FDR to determine the capability of the bank to fulfill short-term obligations or distribute financing quickly. The higher the ratio, the higher is the level of liquidity. The size of the financing determined by the bank is seen from the funds that have been collected, whether they have been distributed optimally or not. When the amount of DPK is high, the bank immediately extends its credit. The higher the FDR in Islamic banking, the higher the ability of Islamic banking to channel financing, including Financing for MSMEs (Saputri & Wibowo, 2018). FDR has a significantly positive effect on financing (Astarini et al., 2016).

The rate of return on investment invested in the *mudharabah* and *musyarakah* systems in banks will increase the financing disbursed; the higher the rate of return from banks to investors, the more investors deposit funds with banks using the *mudharabah* and *musyarakah* systems. Therefore, the level of financing disbursements also increased. This is supported by the research conducted by Shamsudin et al. (2015). The level of profit-sharing has a significant positive effect on the volume of profit-sharing-based financing.

The Covid-19 pandemic is a health crisis that has not only caused death, but also the most unpredictable economic destruction throughout the world. As a result, the real and financial sectors in developed and developing countries are under much greater pressure than before (Gulati et al., 2023). There has been a macroeconomic slowdown and an increase in the risk of default (Beck, 2020). How all sectors can survive and recover from adversity requires the role of banking as an intermediary institution, namely, through the distribution of targeted financing to all levels of business. In its distribution, banks need to consider various factors for the success of Islamic banking as well as for its customers. One of the considerations for Islamic banks in distributing financing is their ability to manage business risks and still pay attention to the productive assets they own.

Macroeconomic factors are a picture of rising or falling financing volumes, domestically driven credit expansion accompanied by currency depreciation, and higher inflation, thus limiting the scope of accommodative monetary policy and the impact of growth (Büyükbaşaran et al., 2022). Therefore, inflation affects transactions in financial institutions, especially in banks (Nadya et al., 2020). Next, macroeconomics, namely the interest rate, is the amount of funds that must be paid to investors entrusted to the bank and the amount of funds that must be returned to customers who have received loans. Increasing interest rates increases the profits generated by the banking itself. However, customer interest in loan applications tends to decline. At high interest rates, business actors have difficulty obtaining capital.

Based on the above explanation, the performance of Islamic banking influences the financing channeled by Islamic banking. The assessment of the performance of Islamic banking can also be seen in the ability of bank liquidity or the level of bank profitability, which is reflected in Islamic banking financial ratios. This study analyzes the factors that influence the amount of Islamic banking financing in Indonesia in the long and short term. The Islamic banks studied were the Islamic Commercial Bank (BUS), Islamic Business Unit (UUS), and Islamic People's Financing Bank (BPRS).

The factors examined come from the internal side of Islamic banking and macroeconomics.

Literature Review

Keynesian Theory of Finance

In Keynes's theory of finance, the purpose of society in asking for money is transactions, speculation, and just in case (Pigou, 1936). Money plays an important role in the daily activities used to buy needs and other transactions. Demand money as a precaution, meaning money will be used later when difficulties occur, and money is used for speculation. However, Islamic banks do not use speculative contracts for financing channels(Fleming, 1964). However, it can be interpreted that money is used to invest in securities (Lintangsari et al., 2018). Islamic finance, of course, has its own place of investment, especially in the products offered by Islamic banks. Thus, money for this investment is affected by the interest rate.

Financing channeled by Islamic banks is a demand for money from the public under various conditions, as described in Keynes's financial theory, namely, for transactions, precautions, or real investment (business development) (García, 2007). However, apart from the demand for money by the public and other external variables, there are internal variables that affect the distribution of financing to banks.

Bank Assets

The greater the banking assets, the more funds that will be channeled to customers. In a study conducted by Silalahi et al. (2012) with bank assets as a control variable in lending to foreign banks in Indonesia, bank assets were found to have a significant positive effect. The greater the assets of foreign bank affiliates, the greater is the lending (Pontines & Siregar, 2012). In selecting portfolio optimization for the placement of bank assets, asset ownership in the form of securities in the money or stock markets shows significant negative results. According to him, this is because credit and placement in securities are substitutes.

Hypotheses

Third Party Funds (DPK)

DPK is customer savings in deposits, current accounts, and savings. Higher growth in DPK collected by Islamic banks will encourage an increase in the amount of financing disbursed, and if there is a decrease in funds collected by banks, there will be a decrease in the volume of financing. Providing credit is a top priority in allocating bank funds because the source of funds comes from the community; therefore, banks must channel the funds collected back to the community in the form of loans (Yasnur & Kurniasih, 2017). The distribution of Financing from Islamic banking is the main activity of banks as a business entity to return to profit-sharing. Therefore, DPK has a significant positive effect on financing or lending in line with research conducted by Giri et al. (2019), Nur'aeni and Setiawan, (2020), and Siringoringo and Sijabat (2023). This relationship is positive because the high amount of DPK collected will also increase credit distribution to the community, so that financing from banks can be more optimal (Giri et al., 2019). Nur'aeni and Setiawan (2020) findings shows that the existence of DPK has a significant influence on financing so that Islamic banks have clear financial opportunities and allocations.

H_1: DPK have a significant positive effect on Islamic banking financing.

Financing Debt Ratio (FDR)

FDR is the result of a comparison of bank financing with DPK collection. Husaeni (2016) conducted research related to *murabaha* financing in Islamic Commercial Banks, where the FDR has a significant positive effect on *murabahah* financing. It is feared that a high FDR poses a risk to Islamic banking liquidity, which will reduce the financing portfolio. Therefore, a high FDR needs to be balanced with the high amount of funds collected from the public. Thus, as FDR increases, financing increases. FDR has a significant positive effect on MSME and non-MSME financing

(Astarini et al., 2016). In addition, the greater the FDR, the more Islamic bank profits will increase; thus, in its implementation, it can increase financing.
H_2: FDR has a significant positive effect on Islamic banking financing.

Net Operating Margin (NOM)

NOM describes the ratio between the bank's net income and total assets by measuring the bank's ability to operate so that optimal profits are obtained (Budianto & Dewi, 2023). A higher net interest margin drives foreign banks to provide credit (Silalahi et al., 2012). Ability of bank management to manage productive assets to obtain revenue sharing. The higher the profit-sharing obtained by Islamic banks in managing their productive assets, the more the financing distribution will be improved to obtain even higher profit-sharing.
H_3: NOM has a significant positive effect on Islamic banking financing.

Non Performing Financing (NPF)

NPF is the ratio of non-current payments in banking, so it is related to a decrease in the provision of financing because funds that should be returned to the banking system and the profit that the banking sector must receive are hampered. It will reduce ROA, and the disbursement of financing will decrease based on research conducted by Huljak et al. (2022), based on impulse response analysis showing that exogenous increases in changes in the NPL ratio tend to depress bank loan volumes and widen bank loan spreads. However, reducing the NPL ratio at a bank generates significant benefits to the financial condition and improves the economy as a whole.
H_4: NPF has a negative effect on Islamic banking financing.

Return on Assets (ROA)

ROA describes a financial ratio that measures bank profitability, which is focused on calculating net profit divided by total bank assets. ROA is influenced by various factors such as asset quality, operations, financing structure, and risk management. ROA will increase financing because, with a positive return, the results received by banks will increase and become a trigger for Islamic banking to increase financing so that the returns received by banks will increase even more. This is in line with previous research (Astarini et al., 2016). Husaeni (2016) shows that the greater the ROA, the better the operational performance of a Islamic bank, because ROA is often used as a measure of the financial performance of a Islamic bank.
H_5: ROA has a significant positive effect on Islamic banking financing.

The equivalent rate of Mudharabah and the Equivalent rate of Musyarakah

Mudharabah finances the implementation of a business with one party as the capital owner and the second party as the executor. *Musyarakah* is a joint business agreement that combines various resources. The equivalent rate of *mudharabah* and the Equivalent rate of *musyarakah* affect disbursed financing because the higher the rate of return on a deposit or investment, the greater the funds accumulated in banks, which will have an impact on the distribution of Financing to Islamic banks. Overall, the *mudharabah* and *musyarakah* interest rates have a positive influence on financing because, apart from a well-structured transaction structure, Islamic compliance and the profit-sharing system are structured so that Islamic bank financing can increase(Warninda et al., 2019).
H_{6a}: ERP *Mudharabah* has a significant positive effect on the Islamic banking financing
H_{6b}: ERP *Musyarakah* has a significant positive effect on the Islamic banking financing

Interest Rates

Interest Rates describe the level of difference in the financing provided by a profit-sharing system. Interest rates affect financing; an interest rate policy is one way to prevent a crisis so that it can become an instrument and bank credit conditions do not worsen. High interest rates will reduce the distribution of financing because the rate of return that the borrower must pay will be high; therefore, there are

fears that there will be non-current payments. Based on this explanation, interest rates affect bank credit growth (Rahmananingtyas 2022; Tanjung et al., 2022). The findings Nouman et al. (2022) describe a positive relationship between variables because interest rates are considered a stable alternative and rising interest rates can spur a bank to make profits.
H_7: Interest Rates has a significant positive effect on the Islamic banking financing

Inflation

Inflation is one of the factors that can trigger an increase in lending rates set by banks. In this case, an increase in inflation affects creditors' credit burden. In the theory of supply and demand, the prices of goods and services increase, and banks increase lending rates. When interest rates rise, bank credit tends to be expensive, thus burdening the public with demand for credit, which can cause the amount of credit to decrease so that the money circulating in the community also decreases (Apriliani et al., 2021).
H_8: Inflation has a significant positive effect on the Islamic banking financing

Research Methods

Based on the research objectives, the authors wanted to understand and analyze the integration of Islamic banking financing and how macroeconomic shocks affect Financing in Islamic banks. The research design uses quantitative analysis with Islamic banking panel data for the period 2019-2022 with monthly data. This study used the VAR/VECM model. This model is capable of estimating short- and long-term relationships.

The VAR or VECM panel approach was used to determine the intensity and speed of adjustment or response of each variable in the study. This method uses VAR in a restricted model, known *as the* VECM (Tabash & Khan, 2018). Additional restrictions must be provided because of nonstationary data forms at the cointegrated data level and level.

The VECM standard mathematical equation obtained from the VAR model is as follows:

$$\Delta Xt\text{-}1 = \mu t + \Pi Xt\text{-}1 + \sum \Delta\, Xt\text{-}1 + \mu t \quad (1)$$

Π and Γ are functions of Ai; matrix Π can be decomposed into 2-dimensional matrices (nxr) α and β: Π = αβT, where α is called the adjustment matrix, and β is the cointegration vector, and r is the cointegration rank. This was tested using the unit root test. Traditional econometric methods can be applied when unit roots cannot be found (Enders, 2014).

The VAR model is an autoregressive form caused by an increase in the lag value of the disturbance of the dependent variable and the error term on the side of the equation. The variables used to analyze total assets, DPK, FDR, NOM, ERP mudharabah, ERP musyarakah, BI rate, and inflation in Islamic bank financing. The model is as follows:

$$\begin{bmatrix} \Delta TA \\ \Delta DPK \\ \Delta FDR \\ \Delta NOM \\ \Delta NPF \\ \Delta ROA \\ \Delta ERPMudh \\ \Delta ERPMusy \\ \Delta BIRATE \\ \Delta INFLASI \end{bmatrix}_{it} = \begin{bmatrix} \alpha_0 \\ \alpha_1 \\ \alpha_2 \\ \alpha_3 \\ \alpha_4 \\ \alpha_5 \\ \alpha_6 \\ \alpha_7 \\ \alpha_8 \\ \alpha_9 \end{bmatrix} + \sum_{t-1}^{k} \tau_{it} \begin{bmatrix} \Delta TA \\ \Delta DPK \\ \Delta FDR \\ \Delta NOM \\ \Delta NPF \\ \Delta ROA \\ \Delta ERPMudh \\ \Delta ERPMusy \\ \Delta BIRATE \\ \Delta INFLASI \end{bmatrix}_{it} + \pi \begin{bmatrix} TA \\ DPK \\ FDR \\ NOM \\ NPF \\ ROA \\ ERPMudh \\ ERPMusy \\ BIRATE \\ INFLASI \end{bmatrix}_{it-1} + \begin{bmatrix} v_0 \\ v_1 \\ v_2 \\ v_3 \\ v_4 \\ v_5 \\ v_6 \\ v_7 \\ v_8 \\ v_9 \end{bmatrix} \quad (2)$$

α_0	Intercept
α_1 - α_7	Variable coefficient
TA_{it}	Total Assets of Islamic Banking i in year t
DPK_{it}	Islamic Banking Third Party Funds i in year t
FDR_{it}	Islamic Banking Financing Debt Ratio i in year t
NOM_{it}	Islamic Banking Net Operating Margin i in year t

NPF_{it}	Non Performing Financing i in year t
ROA_{it}	Return on Asset i in year t
$ERPMUDH_{it}$	Equivalent Rate of Islamic Banking Mudharabah Financing i in year t
$ERPMUSY_{it}$	Equivalent Rate of Islamic Banking Musyarakah Financing i in year t
$BIRATE_{it}$	*BI Rate* i in year t
INFLATION	Islamic Banking Inflation i in year t
v_0-v_7	*Error term*
T	The year 2019-2022
i	BUS, UUS, and BPRS

Results and Discussion

Stationarity Test Results (Augmented Dickey-Fuller (ADF)

From the test results, the unit root test in this research model is based on the augmented Dickey (ADF) test at the level and first difference levels. If the probability of the ADF Test < Mc Kinon Critical Value is at a critical value of 5% and if seen from the probability level of the first difference, then all variables are below 0.05, and the time series data is stationary. Based on the results of the unit root test at the level and first difference, as shown in Table 1, it was found that three variables were stationary at the level, which means that in the original research data, only three variables were stationary at the level. In contrast, the other variables were not stationary. Thus, it is necessary to carry out a unit root test at the first difference level. At the first difference level, where the probability for each variable was <0.05, the time series data used in this study were stationary at the first difference level.

Table 1. *The ADF test results' difference*

Variables	Prob. Levels	Prob. 1st difference
P	0.0087	0.0000*
TA	0.7297	0.0000*
DPK	0.0000*	0.0000*
NOM	0.0170*	0.0000*
FDR	0.5823	0.0000*
NPF	0.5697	0.0000*
ROA	0.0775	0.0000*
ERPMUDH	0.7333	0.0000*
ERPMUSY	0.9216	0.0000*
BIRTE	0.0551	0.0000*
INFLATION	0.5823	0.0000*

Note. *Stationary Data

Before forming the VAR model, it is necessary to determine the optimum lag length because the exogenous variables used are the lag of the endogenous and exogenous variables. We then proceeded to test the optimum lag, and the results showed that the optimum lag in this test was 3.

Lag Length Test

Before forming the VAR model, it is necessary to determine the optimum lag length because causality and VAR tests are very sensitive to the optimal lag length. We then test the optimum lag, and the results obtained from the optimum lag in this test are as follows:

Table 2. Lag Length Criteria

Lag	LogL	LR	FPE	AIC	SC	HQ
0	-6824.195	NA	9.67e+42	130.1942	130.4722	130.3069
1	-6038,411	1391960	3.10e+37	117.5316	120.8681*	118.8836*
2	-5915.828	191.4635	3.22e+37	117.5015	123.8963	120.0928
3	-5729,501	251.9847*	1.12e+37*	116.2572*	125.7103	120.0878

Note. *Indicates lag order selected by the criterion

Table 2 shows that the researchers determined the optimal lag length by looking at the results of the LR statistics, AIC, and FPE at lag 3, each with a value of 251.9847, 1.12e+37, and 116.2572. Based on the results of data processing, the third lag is the right lag to be used for the VECM.

Johansen Cointegration Test

Before analyzing with the VECM, it is necessary to first perform a cointegration test. The existence of research variables that are not stationary, as the results of the stationarity test have been done previously, increases the possibility of a cointegration relationship between variables. The cointegration test is carried out to determine the cointegration relationship so that the long-term relationship between variables can be identified.

Table 3. Johansen Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistics	0.05 Critical Values	Prob.**
None *	0.815809	514.6378	263.2603	0.0001
At most, 1 *	0.607082	343.7679	219.4016	0.0000
At most, 2 *	0.509970	249.4183	179.5098	0.0000
At most, 3 *	0.402966	177.3760	143.6691	0.0002
At most, 4 *	0.339862	125.2822	111.7805	0.0052
At most 5	0.278495	83.33619	83.93712	0.0552
At most 6	0.229857	50.36819	60.06141	0.2507
At most 7	0.096208	23.98907	40.17493	0.7066
At most 8	0.090624	13.77230	24.27596	0.5562
At most 9	0.037957	4.177692	12.32090	0.6852
At most 10	0.002663	0.269333	4.129906	0.6640

Table 3 reports the Johansen Cointegration Test, the cointegration test results show that there is a cointegration relationship (long-term integration) between the independent variables, namely Total assets, TPF, NOM, FDR, NPF, ROA, ERPMUDH, ERPMUSY, BI RATE and INFLATION on the dependent variable Banking Financing Islamic. Johansen Cointegration Test with cointegration testing criteria based on trace stats or probability on each Hypothesized, if the trace-statistics value <critical value, then the value of the variable is not cointegrated. Conversely, if the trace-statistics value > critical value, then the value of the variable is cointegrated. The data above shows five cointegrated equations at a significance level of 5%.

VECM Test Analysis

Table 4 presents the VECM estimation results, showing that the coefficient of determination is 0.572526, meaning that 57.2526% of the variation in Islamic banking financing models can be explained by all the independent variables involved in this study (total assets, DPK, NOM, FDR, NPF, ROA, ERPMUDH, ERPMUSY, BI RATE, INFLATION), while the remaining 42.7474% is explained by other variables not involved in this study.

The VECM test results show that there is a long-term relationship with total assets, DPK, NOM, financing to deposit ratio (FDR), Non-Performing Finance (NPF), Return on Assets (ROA), equivalent rate of *mudharabah* (ERPMUDH*)*, equivalent rate of *musharaka* (ERPMUSY), BI Rate and Inflation on Financing in Islamic Banking. In the long-term relationship, we found that DPK, NOM, NPF, ROA, ERPMUSY, BI RATE, and INLATION have significant effects, with different directions of significance. NPF and inflation negatively impact Islamic banking financing. Meanwhile, the DPK, NOM, ROA, ERPMUSY, and BI rates have a positive direction of significance for Islamic banking financing. Total Assets, FDR and ERPMUDH variables did not significantly affect long-term relationships.

Similar to the results of the short-term VECM test in this study, using lag 3, several variables

significantly affect short-term relationships, including DPK, NOM, ROA, Equivalent rate of *mudharabah*, and inflation. The other variables do not have a significant effect on lag 1,2,3.

Table 4. *VECM Test*

VECM Test Results in the Short Term		
Variables	Coefficient	T-Statistics
CointEq1	-0.019701	[-4.54863]*
D(TA(-1))	3.855174	[0.65044]
D(TA(-2))	8.590538	[1.26520]
D(TA(-3))	7.353793	[1.19101]
D(DPK(-1))	1.208075	[4.60423]*
D(DPK(-2))	1.174109	[4.21724]*
D(DPK(-3))	0.553488	[2.21569]*
D(NOM(-1))	-860925.6	[-1.97848]*
D(NOM(-2))	-8,538,576	[-0.02047]
D(NOM(-3))	-537739.6	[-1.46940]
D(FDR(-1))	33653.57	[0.67098]
D(FDR(-2))	56403.68	[1.16335]
D(FDR(-3))	40553.59	[0.85043]
D(NPF(-1))	-177803.4	[-0.73347]
D(NPF(-2))	-87554.30	[-0.37029]
D(NPF(-3))	-214007.1	[-0.83184]
D(ROA(-1))	1652975.	[2.36243]*
D(ROA(-2))	73081.35	[0.10833]
D(ROA(-3))	-1393144.	[-2.30353]*
D(ERPMUDH(-1))	282767.1	[1.83322]*
D(ERPMUDH(-2))	157839.1	[1.10451]
D(ERPMUDH(-3))	55088.68	[0.44910]
D(ERPMUSY(-1))	5734422	[0.05178]
D(ERPMUSY(-2))	-172553.5	[-1.10931]
D(ERPMUSY(-3))	-210961.6	[-1.59890]
D(BIRATE(-1))	33531.47	[0.21082]
D(BIRATE(-2))	157036.3	[1.06878]
D(BIRATE(-3))	247389.9	[1.61136]
D(INFLATION(-1))	3.020066	[0.33719]
D(INFLATION(-2))	-1,109,135	[-0.90149]
D(INFLATION(-3))	-1,900,847	[-2.10865]*
R-squared	0.572526	
Adj. R-squared	0.361979	
F-statistics	2.719230	

VECM Test Results on the Long Term		
Variables	Coefficients	T-Statistics
TA(-1)	-3,388,254	[-0.60712]
DPK(-1)	57.77287	[10.2327]*
NOM(-1)	12648901	[2.60323]*
FDR(-1)	-569998.6	[-1.08034]
NPF(-1)	-13270930	[-3.84989]*
ROA(-1)	18087162	[1.75814]*
ERPMUDH(-1)	-1805562.	[-1.07474]
ERPMUSY(-1)	4381917.	[2.77136]*
BIRATE(-1)	12284478	[10.8021]*
INFLATION(-1)	-1,484,935	[-1.77724]*

Note. *significant (<5%)

The results of the long-term VECM estimation of the total variable assets have no significant effect on Financing in Islamic banking, with a t-statistical value of Total Assets of -0.60712 < t-table 1.65765. This indicates that the portion of funds that must be channeled to finance customers is independent of the high or low assets owned by Islamic banking. The total assets data owned by Islamic Commercial Banks, Islamic Business Units, and Islamic People's Financing Banks have increased every month. However, the increase is not significant, and the increase in assets from Islamic banking may be non-productive; therefore, it does not significantly impact financing channeled by Islamic banking. The greater the assets owned by Islamic banking, the less it affects the volume of financing distributed by Islamic banking; this is in line with the research conducted by Khotmi et al. (2021). These results differ from those of Kurniawanti (2014), in which the company's total assets significantly influence the volume of profit-sharing-based Financing at Islamic Commercial Banks in Indonesia.

Likewise, with the short-term VECM estimation results indicating that the total asset variable has no effect on Islamic banking financing in lag 1, lag 2, or lag 3, there is no significant

effect. This is possible because changes that occur in the assets owned are not a consideration of the number of funds channeled by Islamic banking, but funds channeled to customers need to consider many other factors so that the risk of default can be managed properly by the banking system. Thus, banking assets do not affect financing in a short-term relationship.

Furthermore, DPK have a significant positive effect on Financing in Islamic banking, with a statistical value of 10.2327 > t-table 1.65765. This is in line with the research conducted by Astarini et al. (2016), Hermuningsih et al. (2020), Husaeni (2016), Pradesyah and Triandhini (2021), and Yasnur and Kurniasih (2017). Statistical results with positive coefficients indicate that increasing DPK increases financing volume. This is similar to the short-term estimation results, where TPF at lag 1, lag 2, and lag 3 affects financing channeled by Islamic banking. In both the short- and long-term, DPK have a significant effect on Islamic banking financing, in line with the function of financial institutions, namely as intermediary institutions, where the distribution of financing will grow along with the development of DPK.

DPK originate from the community and can be in the form of *wadiah* demand deposits, *mudharabah* savings, *mudharabah* deposits. Apart from being collecting institutions, banks as financing channeling institutions are the main priority for banks to distribute their funds. Funds collected from the community are channeled back to the community in the form of financing for their businesses using *mudharabah, musyarakah*, or *murabaha* contracts.

NOM has a significant positive effect, with a t-statistic value of 2.60323 > t-table. Islamic banks' ability to generate profits is important for the sustainability of a company, especially NOM, which is the main ratio in Islamic banks (Fakhri & Darmawan, 2021). Islamic banks in this study have succeeded in creating NOM at a positive point, as evidenced by the results showing that NOM has a significant positive effect on Islamic bank financing. Thus, a high NOM ratio for the success of bank management in managing funds distributed to the public will provide benefits to banks and increase the volume of financing distributed by Islamic banking.

In the short-term estimation, NOM has a significant negative effect on financing only in the first, lag 2 and lag 3; NOM has no significant effect. This indicates that high NOM cannot be felt if it is only in the first lag. A one-month increase in NOM received by Islamic banking has not been able to increase disbursed financing. Banking is still adjusting to an increase in NOM in the short term.

In both the short-term estimates at lags 1, 2, and 3 and the long-term estimates, the Financing to Deposit Ratio has no significant effect on financing, where the t-statistic value of -1.08034 is smaller than the t-table. The results of this study are in line with those of other researchers, namely Khotmi et al. (2021) and Arbi et al. (2019), in contrast to the results carried out by Astarini et al., (2016), where the FDR has a significant effect on MSME or non-MSME financing. The results of this study indicate that the rise and fall in FDR do not affect the increase or decrease in financing. A higher FDR value indicates an increase in the bank's ability to finance channels. However, caution must be exercised if a bank's FDR is too high, which leads to illiquidity. However, the results support the expected hypothesis, namely that there is no effect on financing. Even though it tends to be unstable, the FDR of Islamic banking in Indonesia is still within the safe range set by Bank Indonesia (BI), which ranges from 80% to 110%.

Non-Performing financing has a significant negative effect on financing, with a t-statistic value of -3.84989 > t-table. This means that the higher the NPF of Islamic banking, the lower is the disbursed financing. This is in line with several studies conducted by Pradesyah and Triandhini (2021) and Ivakhnenkov et al. (2021); in addition, shocks to non-performing loans will have an impact on credit growth (Klein, 2013). At the same time, Yasnur and Kurniasih (2017) results showed a significant positive. In this result, the higher the NPF will reduce the growth of Islamic banking credit. If the number of non-performing loans at the bank is high, you will lose the opportunity to obtain income from the financing that has been distributed. Therefore, the risks that need to be considered by banks when channeling financing to customers need to be screened for businesses owned, because if continuous bad loans are not addressed, it will have an impact on reduced Islamic bank capital and a decrease in the volume of disbursed financing. However, the impact of the change in NPF cannot be felt on financing channeled by Islamic banking in the short term, namely, in lag 1, lag, or lag 3, but the impact can be felt in long-term financing. Islamic

banking must continue to see changes in NPF from short-term data so that a decrease in long-term disbursed financing can continue to be monitored and corrections can be made.

ROA has a significant positive effect on financing, with a t-statistic significance value of 1.75814 > t-table. From the results of this study, the authors found that many studies had the same results, namely, the higher the ROA, the higher the Financing in Islamic banking. This is also supported by the research conducted by Husaeni (2016) and Hermuningsih et al. (2020). ROA is a financial ratio that shows how profitable a company is in terms of its total assets. Company management, analysts, and investors can use ROA to determine how efficiently a company uses its assets to generate profit. A higher ROA is a positive signal, more efficient, and productive in managing the balance sheet to generate profits. Therefore, the connection with financing is that when the profit earned by the bank increases, it must maintain and increase its profit through the volume of financing.

The same is true for the short-term estimates. The results of the relationship between ROA and disbursed financing show a significant effect on lags 1 and 3. Therefore, there is a close relationship between the profits generated by Islamic banking and financing distributed by Islamic banking. Thus, banks must maintain their profits at a positive level so that they can continue to increase their financing to customers. The impact of financing received by customers or the public contributes to a country's welfare and economy of a country (Banu, 2013).

The t-statistic significance value of -1.07474 < t-table indicates that profit sharing from investment using a *mudharabah* contract does not change significantly, so there is no effect on disbursed financing by banking. In addition, the dependent variable used in this study is a combination of financing from various contracts and not financing based on *mudharabah* contracts. Therefore, it is possible that there were no significant effects. Based on data from Islamic banking statistics, the most widely used Financing is Financing with a *murabaha* contract. Thus, the size of the rate of return for investors does not affect financing. This finding is not in line with the results of research conducted by Kurniawanti (2014).

In short-term relationships, only the equivalent rate of *mudharabah* in lag 1 has an effect on disbursed financing; *mudharabah* profit sharing for lag 1 investors is influential. It is possible for investors to see the size of the profit sharing set by Islamic banks, but the impact is only on lag 1.

The equivalent rate of *musyarakah* has a significant positive effect on financing, with a t-statistic significance value of 2.77136. In contrast to the results for the *mudharabah* rate of return on financing, the equivalent rate of *musyarakah* has a significant positive effect on disbursed financing. The high equivalence rate of *musyarakah* attracts investors to invest their funds in banking with *musyarakah* contracts. Thus, financing disbursed by banks is increased. Based on Islamic banking statistical data, financing with a *musyarakah* contract is the second-largest financing option after financing with a murabaha contract. The results of this study align with those of Kurniawanti (2014), and Setiyoaji and Mawardi (2019). However, the results differ in short-term relationships, where the equivalent rate of *musyarakah* does not affect Lag 1, Lag 2, and Lag 3.

The BI rate has a significantly positive effect on financing, with a t-statistic significance value of 10.8021. The BI rate policy is one of the government's ways of responding to the problem of high and uncontrollable inflation, thus triggering the government to monitor the circulation of money in society, especially banking, where banking is one of the institutions that influence this, namely, conducting fundraising. In addition, funds were distributed throughout the community. The results show that the financing carried out by Islamic banking also increases when the BI rate increases. This is made possible as a result of rising inflation, where prices continue to rise and the cost of materials or other needs also increases. Therefore, people need an injection of funds to deal with this increase (Jessica & Chalid, 2021; Jayawarsa et al., 2021), the results of the BI rate affect the financing distributed by banks to customers, researchers conducted insignificant results (Odah et al., 2017; Yasnur & Kurniasih, 2017). The BI rate does not affect credit, and the short-term estimates tested in this study also show that the BI rate does not affect financing extended by Islamic banking.

Inflation has a significant negative effect on financing, with a significant t-statistic value of -1.77724 for long-term relationships. In addition, it has a significant effect on short-term relationships only at lag three, meaning that an increase in inflation has an impact on the decrease

in financing distributed by Islamic banking to customers. Inflation is a problem that exists in every country and can occur at any time. Thus, it is necessary to have direct control from the government through the Indonesian Central Bank regarding BI rate policy. Therefore, the control carried out by the government when inflation is high is to suppress the rising BI rate. Thus, when there is an increase in inflation, there will be policies related to the BI rate, which will also increase, impacting customers who delay applying for financing. The results were carried out by Tanjung et al. (2022), where inflation significantly affects bank credit.

Granger Causality Analysis

Table 5. Causality Test Results

Null Hypothesis:	F-Statistics	Null Hypothesis:	Statistics
TA – P	0.32362	NPF – NOM	0.83225
P–TA	0.06951	NOM – NPF	1.06996
DPK – P	6.94847	ROA – NOM	3.39034
P – DPK	0.44057	NOM – ROA	1.37420
NOM – P	0.48177	ERPMUDH – NOM	1.95307
P–NOM	0.18013	NOM – ERPMUDH	0.49438
FDR – P	0.30316	ERPMUSY – NOM	1.56276
P–FDR	0.32579	NOM – ERPMUSY	2.36132
NPF – P	0.15903	INFLATION – NOM	0.83393
P – NPF	1.00557	NOM – INFLATION	0.35589
ROA – P	0.38807	BIRATE – NOM	2.75621
P–ROA	0.64889	NOM – BIRATE	1.30409
ERPMUDH – P	0.14395	NPF – FDR	0.17870
P – ERPMUDH	0.83951	FDR – NPF	0.87575
ERPMUSY – P	0.11373	ROA – FDR	0.66047
P – ERPMUSY	1.13420	FDR – ROA	1.71541
INFLATION – P	0.15930	ERPMUDH – FDR	0.12887
P – INFLATION	1.46680	FDR – ERPMUDH	0.52026
BIRATE – P	3.15877	ERPMUSY – FDR	0.27349
P – BIRATE	0.29585	FDR – ERPMUSY	0.65186
DPK – TA	0.02289	INFLATION – FDR	0.46499
TA – DPK	0.07042	FDR – INFLATION	1.08538
NOM – TA	0.41704	BIRATE – FDR	6.63039
TA – NOM	1.56170	FDR – BIRATE	0.05357
FDR – TA	0.60486	ROA – NPF	0.02527
TA – FDR	0.80197	NPF – ROA	0.12486
NPF – TA	0.00341	ERPMUDH – NPF	0.25017
TA – NPF	0.87030	NPF – ERPMUDH	1.80224
ROA – TA	0.09646	ERPMUSY – NPF	0.32759
TA–ROA	2.84298	NPF – ERPMUSY	0.71602
ERPMUDH – TA	0.12143	INFLATION – NPF	0.23010
TA – ERPMUDH	0.57676	NPF – INFLATION	0.92303
ERPMUSY – TA	0.04019	BIRATE – NPF	1.80556
TA – ERPMUSY	0.49341	NPF – BIRATE	0.15535
INFLATION–TA	0.50016	ERPMUDH – ROA	0.44027
TA–INFLATION	1.70935	ROA – ERPMUDH	0.01822
BIRATE–TA	8.83017	ERPMUSY – ROA	0.14295
TA–BIRATE	0.91315	ROA – ERPMUSY	0.11686
NOM–DPK	0.31831	INFLATION – ROA	3.22699
DPK–NOM	18.1055	ROA – INFLATION	0.35726
FDR–DPK	0.04912	BIRATE – ROA	5.81442
DPK–FDR	0.26012	ROA – BIRATE	0.01088
NPF–DPK	2.10963	ERPMUSY – ERPMUDH	3.02206
DPK–NPF	0.79208	ERPMUDH – ERPMUSY	1.76849
ROA–DPK	0.23079	INFLATION – ERPMUDH	0.90971

Null Hypothesis:	F-Statistics
DPK–ROA	1.41516
ERPMUDH – DPK	0.37479
DPK – ERPMUDH	0.66432
ERPMUSY – DPK	0.17389
DPK – ERPMUSY	1.36518
INFLATION – TPF	0.73615
DPK – INFLATION	0.58348
BIRATE – DPK	0.32466
DPK – BIRATE	0.04890
FDR – NOM	0.31755
NOM – FDR	0.28597

Null Hypothesis:	Statistics
ERPMUDH – INFLATION	0.36206
BIRATE – ERPMUDH	1.98185
ERPMUDH – BIRATE	0.73688
INFLATION – ERPMUSY	0.57246
ERPMUSY – INFLATION	0.90835
BIRATE – ERPMUSY	1.47440
ERPMUSY – BIRATE	0.57822
BIRATE – INFLATION	1.88526
INFLATION – BIRATE	2.29785

Table 5 shows The results of the variable causality test with the Granger causality test; it was found that, in general, the causal relationship formed in this study was that the variables used were unidirectional (Goyal et al., 2023). That is, changes between one variable and another are responded to without any reciprocal relationship. In this study, the volume of Islamic banking financing in long-term relationships tends to respond to changes in different directions.

A significant unidirectional relationship occurs in the DPK variable for Islamic banking financing, while the Islamic financing variable does not affect DPK. The DPK variable strongly influences financing distributed by Islamic banking in Indonesia. Funds collected from customers increase or decrease the distribution of financing by banks. Conversely, fluctuations in financing do not affect bank DPK.

BI rate has a unidirectional relationship with Islamic bank financing. This proves that bank offers in terms of financing or requests for financing submitted by customers follow the central bank's BI rate. In contrast, the determination of the BI rate or its fluctuation is not based on financing channeled by Islamic banking. Therefore, the two variables only have a one-way relationship. The credit policy should shape the content of the loan portfolio, establish standards for making credit decisions, and analyze errors. The principles of the balanced credit policy and its main stages are systematized (Karvopa, 2019)

Furthermore, Total Assets have a one-way relationship with ROA, but ROA does not affect total assets. The productive assets owned by Indonesian Islamic banking affect bank profitability because the profit generated by banks depends on their productive assets.

Likewise, ROA only affects the NOM but does not have a reciprocal direction. NOM does not have a significant effect on ROA. This indicates that the profits obtained by Islamic banks in Indonesia see the management of each bank in managing its productive assets so that it will increase the revenue sharing to be received, but on the other hand, NOM does not affect ROA.

Furthermore, the BI rate has a unidirectional relationship with NOM, but NOM does not have a unidirectional influence on the BI rate, where the central bank sets the BI rate to regulate all macro issues or the circulation of money in society so that the economy remains stable. Thus, in stabilizing economic conditions, the central bank issues its policy through the BI rate, so that the revenue sharing received by the bank can be adjusted.

Thus, with the result that the BI rate has a unidirectional relationship with the FDR, on the other hand, FDR does not have a significant effect on the BI rate. This is the same as the previous explanation of how the BI rate can affect several variables in this study, but these variables cannot decrease or increase the BI rate set by the central bank. A bank's strategic development plan determines its credit targets and standards. They can be formulated in the long-term development plan and current year's bank budget (Karvopa, 2019).

Inflation has a one-way relationship with ROA, but ROA does not. Inflation is believed to be a macroeconomic variable that can affect the profitability of Islamic banks but cannot be strongly influenced by bank performance (Goyal et al., 2023).

BI rate has a one-way relationship with ROA. The macro-variables used in this study influence many Islamic bank variables. Macro variables, as in this study, inflation, and BI rate are not influenced by internal banking variables. If there is a strong regulatory framework for systemic

risk, larger banking sectors should be more stable than smaller ones (Goyal et al., 2023).

Figure 2 presents the IRF plot for the next 10 months, in which these variables respond to shocks or shocks from the other variables. The following is the response to Islamic banking financing for the next ten months. The Financing response to the shock of total assets in the second to fourth months increases, but the financing response to total assets weakens to a negative value in the following months. The importance of banking assets impacts the amount of financing, including customer trust in the bank itself.

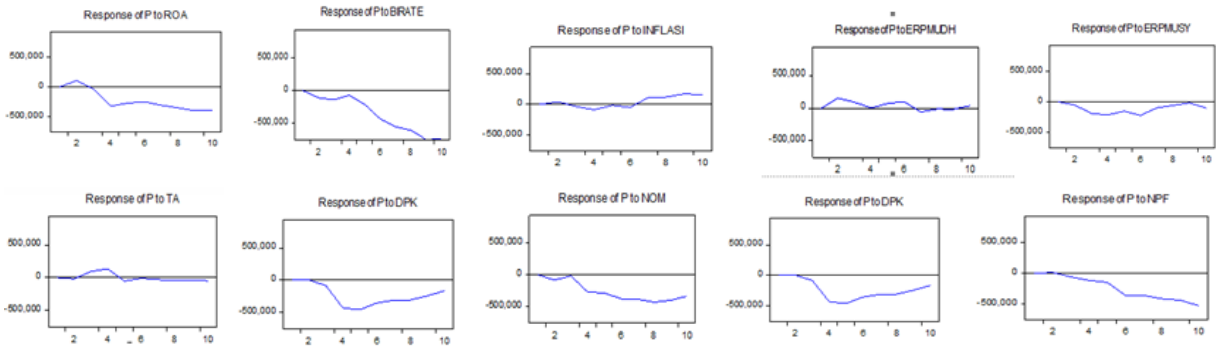

Figure 2. Analysis of Impulse Response Function

The financing response to third-party funding shocks was negative. This means that if there is a shock of one standard deviation from TPF, then Islamic banking financing will react negatively to DPK. DPK are also important because funds collected in the community will be redistributed through various financing sources. Therefore, the financing shock response to the (NOM) was negative, and the months experienced a significant negative decline starting from the fourth month to the ninth month. If there is a shock to the bank's operating profits, financing responds negatively. This indicates that the shock that occurred was negative.

The Financing to FDR shock response in the first to fifth months was positive, but in the sixth month and beyond, it decreased negatively. Islamic banking needs to pay attention to the FDR ratio, because the results are positive. Then, the financing shock response to NPF experienced a significant decline, starting from the first month and continuing to be negative until the tenth month. Shocks that occur in the NPF respond negatively over the next few months with financing.

The Financing shock response to ROA in the first month was positive, but in the third month, it continued to decline. Likewise, profits from owned assets impact the demand for financing. Then, the financing response to ERPMUDH shocks, where the shock that occurred, was responded to with financing whose value fluctuated but was not significant, where the direction of this response was initially positive, but in the middle of the year, it experienced a negative value. The Financing response to the ERPMUSY shock can be seen in the picture, where financing has a negative response in the long term.

Finally, the financing response to the BI rate shock is negative, continuing to experience significant declines every month. Similar to the financing response to inflation shocks, the response was not very prominent but was significant and only limited.

Conclusion

Based on the short-term estimates of DPK, NOM, ERPMUDH, and Inflation significantly affect financing. Based on the long lag test, lag 3 was selected as lag 1 or 2. That is, an increase or decrease in the above variables can affect direct Islamic banking financing in short-term relationships.

Likewise, the results of the Impulse Response Function, which in this study wanted to see the reaction of Islamic banking financing due to the shock of the variables used in the study. If seen from the IRF image, the response was felt only at ten months, so it was not too long. In this case, Islamic Financing responds significantly in a negative direction due to the shocks that occur in each variable.

Based on the long-term estimates, the increase or decrease in the DPK, NOM, ROA, NPF, ERPMUSY, BIRATE, and INFLATION variables can be felt directly by Islamic banking financing, and the perceived impact is long-term. Therefore, Islamic banking needs to supervise and resolve the internal influence of each bank and the macro influence that can be felt in the long term on Islamic banking financing.

Furthermore, based on the Granger causality test, the causality relationship formed between the variables used is unidirectional. Thus, changes between one variable and another respond without any reciprocal relationships.

This research is still limited to 2019-2022, further studies should be longer and use different regression methods or tools.

Acknowledgments

This research is part of the research team at the Faculty of Economics and Business, Universitas Islam Negeri Salatiga, Universitas Islam Negeri Raden Fatah Palembang, Universitas Islam Negeri Raden Mas Said Surakarta, and Universitas Islam Sulthan Sharif Ali Brunei Darussalam. Thanks are expressed to Mr. Dean Dr. Mochlasin, M. Ag, as supporter of the research team, and inspiration for the research team to develop further. We also thank the Asian Journal of Islamic Management for providing a forum for this article.

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