# Interaction Model of Macroeconomic and Microeconomic Variables on Growth Volatility of Various Types of Financing in Islamic Banks

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**Abstract.** Islamic banks in Indonesia have three types of financing, namely: equity-based financing, debt-based financing, and leasing-based financing. This study aims to find an effective formula for encouraging the growth of the three types of financing. This study uses a quantitative approach with data analysis methods Error Correction Model (ECM) and Co-integration. Secondary data was selected as a sample from the fourth quarter of 2014 to the first quarter of 2022. Overall growth of Islamic bank financing is influenced by macroeconomic and microeconomic variables. In terms of macroeconomic variables, growth in equity-based financing is more influenced by economic growth than the interest rate and inflation. Meanwhile, the growth of debt-based financing and leasing-based financing is more influenced by interest rates than economic growth. In terms of microeconomic variables, the growth of third-party funds always affects the three types of financing, while non-performing financing and equivalent rate only affect the growth of equity-based financing. Macroeconomic variables such as economic growth and interest rate can be used as indicators in controlling the growth of the three types of Islamic bank financing, while microeconomic variables such as the growth of third-party funds are the determinants in encouraging the growth of the three types of financing, in addition to non-performing financing and the equivalent rate. It is recommended that Islamic banks focus more on raising third-party funds to encourage the growth of their financing, because the market share of Islamic banks is still small, which allows for the large potential for raising funds that have not been explored.

**Keywords:** equity-based financing · debt-based financing · leasing-based financing · macroeconomic · microeconomic

# 1   Introduction

The banking industry has an important role in the economy of a nation. Islamic banks as part of the national banking industry also play an important role in the Indonesian economy. Islamic banks play a role in encouraging economic growth (Anwar et al., 2020; Hachicha & Ben Amar, 2015; Riyanto, 2016). Through financing channeled by Islamic banks, the problem of business capital needs can be resolved, especially among micro, small, and medium enterprises (Ledhem & Moussaoui, 2021; Najihah & Permatasari, 2021; Rokhlinasari & Widagdo, 2019). Islamic bank financing plays an important role in boosting the economy of small people by creating jobs that ultimately reduce the unemployment rate (Amelia & Hardini, 2017). Financing disbursed by Islamic banks has a greater impact than conventional bank loans in reducing poverty (Tohirin & Husaini, 2019). In addition, Islamic bank financing also plays an important role in improving investment efficiency (Guizani & Ajmi, 2021).

Based on the purpose of its use, Sharia financing is divided into four categories: financing with profit-sharing principles, buying and selling, renting, and financing with complementary contracts (Karim, 2016). Of the four principles, the principles of equity-based financing, debt-based financing, and leasing-based financing are most often implemented by Islamic banks in Indonesia.

Equity-based financing is a characteristic of Islamic banks as well as differentiating from conventional banks through two contracts, namely: mudharabah and musyarakah. Equity-based financing should be more dominant than other types of financing in Islamic banks, because the profit-sharing system drives more productive businesses, to create new jobs (Giannini, 2013). Profit-sharing financing has also been proven to be able to boost a country's economic growth (Chowdhury et al., 2018) and contribute to industrial growth by encouraging productive business (Bougatef et al., 2020).

However, there are still obstacles encountered in managing profit-sharing financing, including high investment risks, difficulties in choosing the right partner, demand from customers who have low creditworthiness, and lack of capital security (Abdul-Rahman & Nor, 2016; Habibi & Rusgianto, 2021). This requires Islamic banks to apply the principle of high-risk high return much better than conventional banks.

On the other hand, the rapid growth of financing in Islamic banks in Indonesia is still dominated by murabahah (debt-based financing) which is considered to lack reflect the characteristics of Islamic banks themselves (Pramono, 2013). The same is true in Malaysia, non-profit and loss sharing (debt-based financing and leasing-based financing) is more attractive than profit and loss sharing (equity-based financing) which has many limitations compared to debt-based financing (Mohd Nor & Ismail, 2020). Although debt-based financing still dominates the financing portfolio of Islamic banks, equity-based financing has slowly begun to shift its dominance (Habibi & Rusgianto, 2021).

Figure 1 shows that initially, buying and selling financing was much larger in the percentage of distribution, but gradually the percentage of profit-sharing financing distribution began to offset. The contradictions that occurred in the early period of the existence of financing disbursements in the Indonesian Islamic banking industry began to lead to the characteristics of Islamic banks that prioritize the principle of profit and loss sharing (equity-based financing). Changes in the distribution pattern of profit-sharing
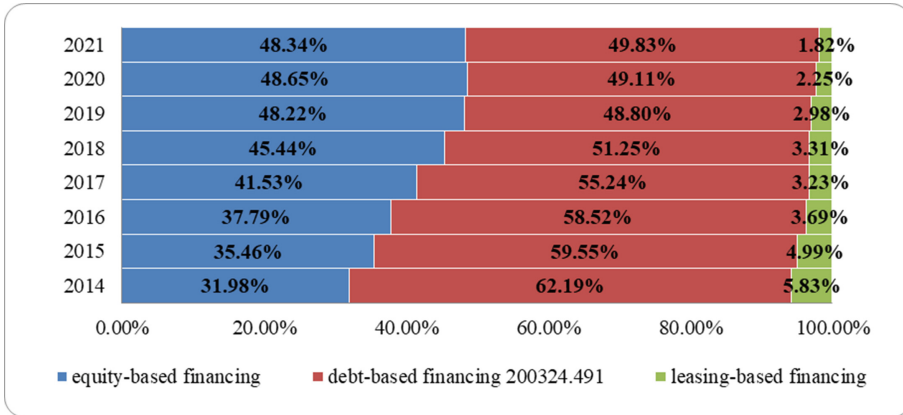
**Fig. 1.** Percentage of Sharia Banking Financing Types in Indonesia for the 2014–2021 period. Source: Financial Services Authority (2014–2021)

financing distribution are certainly a concern in themselves. Why did that happen? What factors cause it to happen? What macro- and microeconomic indicators affect it?

## 2   Literature Review

Many factors can influence banks in disbursing their financing, both factors that come from internal banks and factors that come from external banks. There are several ways to identify factors that can affect financing in Islamic banks, be it total financing disbursed or financing based on its type (be it equity-based financing, debt-based financing, and leasing-based financing) as previous researchers have done.

According to several previous studies, the growth of total Islamic bank financing is influenced by microeconomic and macroeconomic factors. Several microeconomic factors, including non-performing financing (Nastiti & Kasri, 2019), operational efficiency (Nastiti & Kasri, 2019), liquidity (Murni et al., 2018; Nastiti & Kasri, 2019), and profitability (Murni et al., 2018; Nastiti & Kasri, 2019). Meanwhile, macroeconomic factors that affect financing growth include economic growth (Anwar et al., 2020; Ayyubi et al., 2017; Hafizh et al., 2020), inflation (Mubarok et al., 2020; Nastiti & Kasri, 2019), interest rate (Hafizh et al., 2020; Mubarok et al., 2020), composite stock price index (Hafizh et al., 2020), and exchange rate (Mubarok et al., 2020).

The microeconomic and macroeconomic factors that affect the growth of equity-based financing include: the growth of third-party funds (Annisa & Yaya, 2015; Arnan & Kurniawasih, 2014; Destiana, 2016; Furqaini & Yaya, 2016; Giannini, 2013; Ispad, 2019; Jamilah, 2016; Priyanto et al., 2016), growth of mudharabah deposits (Kiswanto, 2013; Pramono, 2013; Riyanto, 2016), non-performing financing (Annisa & Yaya, 2015; Arnan & Kurniawasih, 2014; Destiana, 2016; Ispad, 2019; Jamilah, 2016; Kalkarina et al., 2016; Kurniawanti & Zulfikar, 2014; Murni et al., 2018; Nastiti & Kasri, 2019; Riyanto, 2016), the influence of the profit-sharing rate (Kiswanto, 2013; Kurniawanti & Zulfikar, 2014; Pramono, 2013; Riyanto, 2016), operational efficiency (Jamilah, 2016;

Nasti & Kasri, 2019), liquidity (Furqaini & Yaya, 2016; Giannini, 2013; Jamilah, 2016; Ningsih, 2017; Priyanto et al., 2016; Syu'la et al., 2021), economic growth (Hafizh et al., 2020), inflation rate (Mubarok et al., 2020; Priyanto et al., 2016), and interest rates (Hafizh et al., 2020; Mubarok et al., 2020; Priyanto et al., 2016).

The growth of debt-based financing according to several previous studies was influenced by third-party funds (Azka & Wibowo, 2018; Dwijayanty, 2018; Nurrahma, 2016; Yanis, 2015), non-performing financing (Dwijayanty, 2018; Nurrahma, 2016), margin (Azka & Wibowo, 2018), operational efficiency (Dwijayanty, 2018), liquidity (Dwijayanty, 2018; Rahmawati, 2017), and inflation (Azka & Wibowo, 2018). Leasing-based financing is influenced by third-party funds, profitability, and liquidity (Gunanto et al., 2018).

Several previous studies have found conflicting results on factors affecting the ups and downs of financing growth in Islamic banks. According to Destiana (2016), Ispad (2019), Jamilah (2016), and Syu'la et al. (2021) the growth of third-party funds has a positive effect on the growth of financing, while Priyanto et al. (2016) found that the growth of third-party funds had a negative effect on the growth of financing. In equity-based financing, non-performing financing as measured by non-performing financing negatively affects the growth of equity-based financing, as found by Annisa & Yaya (2015), Furqaini & Yaya (2016), Ispad (2019), and Priyanto et al. (2016). Meanwhile, according to Destiana (2016), non-performing financing has a positive effect on the growth of equity-based financing.

Third-party funds raised by Islamic banks in the form of savings, time deposits, and current accounts must be channeled by banks in the form of financing, considering the main obligations of Islamic banks as intermediation institutions. The more third-party funds that enter Islamic banks, the higher the financing that can be channeled. Annisa & Yaya, (2015), Arnan & Kurniawasih (2014), Destiana (2016), Furqaini & Yaya (2016), Ispad (2019), and Kalkarina et al. (2016) revealed that the growth of third-party funds will drive the growth of equity-based financing. While Azka & Wibowo (2018), Dwijayanty (2018), and Yanis (2015) revealed that the growth of third-party funds will encourage the growth of debt-based financing. Based on these findings the first hypothesis was put forward.

$H_{1a}$:third-party funds have a significant positive effect on total financing.

$H_{1b}$:third-party funds have a significant positive effect on equity-based financing.

$H_{1c}$:third-party funds have a significant positive effect on debt-based financing.

$H_{1d}$:third-party funds have a significant positive effect on leasing-based financing.

The profitability of Islamic banks identified by return on assets shows the bank's ability to generate profits. The high number of Islamic banks obtaining profits will encourage Islamic banks to expand through financing. Giannini (2013), Ningsih (2017), Syu'la et al. (2021), and Yanis (2015) revealed that return on assets has a positive effect on financing growth. On this basis, the second hypothesis was put forward.

$H_2$:profitability has a significant positive effect on total financing.

Profit sharing or ratio is an agreement between the fund owner and the fund manager which is carried out at the beginning of the contract regarding the size of each portion of the profit sharing to be received. The profit sharing rate is the proportion of the distribution of business results that will be received by fund owners and fund managers who have agreed (Rahmawati, 2017). In addition according to Kurniawanti & Zulfikar (2014), Profit sharing level is an important factor in equity-based financing (mudharabah and musyarakah) which tends to have a high risk compared to other types of financing because the returns obtained by Islamic banks are uncertain. Annisa & Yaya (2015), Giannini (2013), Kiswanto (2013), and Kurniawanti & Zulfikar (2014) found that the greater the profit-sharing rate set by Islamic banks, it will spur Islamic banks to channel profit-sharing-based financing. Moreover, Azka & Wibowo (2018) also revealed that the high margin of murabahah financing (debt-based financing) will encourage the high growth of debt-based financing. On this basis, the third hypothesis was put forward.

$H_{3a}$:Equivalent rate equity-based financing has a significant negative effect on equity-based financing.

$H_{3b}$:Equivalent rate debt-based financing has a significant negative effect on debt-based financing.

$H_{3c}$:Equivalent rate leasing-based financing has a significant negative effect on leasing-based financing.

Non-performing financing is defined as a credit whose payment does not meet the minimum obligations set so that the credit is difficult to repay or cannot be collected (Hadiyati, 2013). Non-performing financing represents the level of cost control and bank financing policy (Kalkarina et al., 2016). Non-performing Financing is a risk that must be borne by Islamic banks in disbursing financing. The high level of non-performing financing indicates the high credit risk borne by Islamic banks, so Islamic banks must reduce the amount of financing disbursed (Annisa & Yaya, 2015; Furqaini & Yaya, 2016; Ispad, 2019; Nugraheni & Alimin, 2020; Riyanto, 2016). On this basis, the fourth hypothesis was put forward.

$H_{4a}$ :Non-performing financing has a significant negative effect on total financing.

$H_{4b}$ :Non-performing equity-based financing has a significant negative effect on equity-based financing.

$H_{4c}$ :Non-performing debt-based financing has a significant negative effect on debt-based financing.

$H_{4d}$ :Non-performing leasing-based financing has a significant negative effect on leasing-based financing.

The magnitude of a country's economic growth indicates an increase in production activity in the country. High production activities will encourage business capital needs both in the long and short term. The fulfillment of business capital needs can be met by financing, one of which is from Islamic banks. This shows that an increase in a country's economic growth will be followed by an increase in the amount of financing. As revealed by Anwar et al. (2020), Ayyubi et al. (2017), and Hafizh et al. (2020) that

economic growth has a positive impact on the growth of profit-sharing financing. From the above thoughts, the fifth hypothesis of the study was put forward.

H$_{5a}$ :Economic growth has a significant positive effect on total financing.

H$_{5b}$ :Economic growth has a significant positive effect on equity-based financing.

H$_{5c}$ :Economic growth has a significant positive effect on debt-based financing.

H$_{5d}$ :Economic growth has a significant positive effect on leasing-based financing.

Inflation indirectly affects the growth of financing. Inflationary turmoil shown by commodity and service prices has contributed to reducing people's purchasing power, which in turn contributes to reducing demand for financing. As one of the macroeconomic indicators, inflation is the government's reference in the process of making monetary policy. The high inflation rate requires the government to raise the interest rate, which has an impact on increasing financing prices in the banking sector (including Islamic banks) (Mubarok et al., 2020). Indirectly, inflation will encourage a slowdown in customer demand for financing as revealed by Azka & Wibowo (2018), Mubarok et al. (2020), Nastiti & Kasri (2019), and Priyanto et al. (2016) that inflation has a significant negative effect on revenue sharing financing. Based on these findings, this sixth hypothesis was put forward.

H$_{6a}$ :Inflation has a significant negative effect on total financing.

H$_{6b}$ :Inflation has a significant negative effect on equity-based financing.

H$_{6c}$ :Inflation has a significant negative effect on debt-based financing.

H$_{6d}$ :Inflation has a significant negative effect on leasing-based financing.

The bank's reference interest rate is the price level that must be paid in the event of exchange between one current rupiah and one rupiah in the future (Elkamiliati & Ibrahim, 2014). The increase in interest rates will burden the banking world to pay interest expenses and liabilities which ultimately reduces banking profits. Islamic financing responds positively to innovation in real output. In addition, price level shocks also tend to have a significant effect but lag behind the provision of Islamic bank financing. Islamic financing was negatively impacted immediately by positive interest rate shocks, contrary to the argument that the operations of Islamic banks are protected from interest rate fluctuations. Indeed, the excess sensitivity of Islamic banks to interest rate fluctuations and their slow response to price level shocks (H. Ibrahim & Sufian, 2014). However, on the other hand, with the increase in interest rates, namely the application for financing in Islamic banks by customers is expected to increase in line with the increase in interest on loans at conventional banks or commercial banks, which means providing benefits for Islamic banks (Elkamiliati & Ibrahim, 2014). This indicates that the increase in interest rates will encourage the growth of financing in Islamic banks (Hafizh et al., 2020; Mubarok et al., 2020). On this basis, the seventh hypothesis was put forward.

H$_{7a}$ :Interest rate has a significant positive effect on total financing.

H$_{7b}$ :Interest rate has a significant positive effect on equity-based financing.

H$_{7c}$ :Interest rate has a significant positive effect on debt-based financing.

$H_{7d}$ :Interest rate has a significant positive effect on leasing-based financing.

## 3   Research Methods

This study identifies the factors that influence the growth of financing in the Islamic banking industry in Indonesia. The sampling technique used in this study refers to the purposive sampling technique, which is to select sample members based on certain considerations and criteria. The sample criteria used include current data which is considered more specific than previous data and the adequacy of relevant data from the fourth quarter of 2014 to the first quarter of 2022. The data collection method is obtained from published Islamic banking statistics, and the documentary data collection method is taken from the Financial Services Authority (OJK), Bank Indonesia (BI), and the Central Bureau of Statistics (BPS).

The variables used in this study are financing (total financing (FIN), equity-based financing (EBF), debt-based financing (DBF), leasing-based financing(LBF)) at Islamic Commercial Banks (BUS) and Sharia Business Units (UUS) in Indonesia as the dependent variable, while third party funds (TPF), return on assets (ROA), equivalent rate (ER), non-performing financing (NPF), economic growth (EG), inflation (INF) and interest rates (RATE) are independent variables.

The analysis technique used in this research is Co-Integration and Error Correction Model (ECM). The Co-Integration and ECM methods are commonly used for time series data that have the potential for spurious regression. This method has the advantage of identifying the long-term and short-term effects of the independent variables on the dependent variable simultaneously. This method also can analyze the consistency of the model proposed in a study. Specifically, co-integration is used to see whether there is consistency in the effect of the independent variable on the dependent variable in the long run, while the ECM itself is used to identify the short-term behavior. The results of the analysis of both will be obtained which variables can be used as indicators in encouraging the growth of responsive financing in the short term and consistent in the long term.

The short-term and long-term equation models used in this study use the Engel-Granger (EG) two-step ECM model (Engle & Granger, 1987). The estimation of the short-term regression model is written in Eqs. (1–4) as follows:

$$D(LnFIN_t) = \alpha_0 + \alpha_1 D(LnTPE_t) + \alpha_2 D(ROA_t) + \alpha_3 D(NPF_t) + \alpha_4 D(EG_t) + \alpha_5 D(INF_t) \\ + \alpha_6 D(RATE_t) + \alpha_7 EC\_FIN_t \tag{1}$$

$$D(LnEBF_t) = \beta_0 + \beta_1 D(LnTPE_t) + \beta_2 D(ER\_EBF_t) + \beta_3 D(NPF\_EBF_t) + \beta_4 D(EG_t) + \beta_5 D(INF_t) \\ + \beta_6 D(RATE_t) + \beta_7 EC\_EBF_t \tag{2}$$

$$D(LnDBF_t) = \gamma_0 + \gamma_1 D(LnTPE_t) + \gamma_2 D(ER\_DBF_t) + \gamma_3 D(NPF\_DBF_t) + \gamma_4 D(EG_t) + \gamma_5 D(INF_t) \\ + \gamma_6 D(RATE_t) + \gamma_7 EC\_DBF_t \tag{3}$$

$$D(LnLBF_t) = \delta_0 + \delta_1 D(LnTPE_t) + \delta_2 D(ER\_LBF_t) + \delta_3 D(NPF\_LBF_t) + \delta_4 D(EG_t) + \delta_5 D(INF_t) \\ + \delta_6 D(RATE_t) + \delta_7 EC\_LBF_t \tag{4}$$

While the estimation of the long-term regression model is written in Eq. (5–8) as follows:

$$LnFIN_t = \alpha_0 + \alpha_1 LnTPE_t + \alpha_2 ROA_t + \alpha_3 NPF_t + \alpha_4 EG_t + \alpha_5 INF_t + \alpha_6 RATE_t \tag{5}$$

$$LnEBF_t = \beta_0 + \beta_1 LnTPE_t + \beta_2 ER\_EBF_t + \beta_3 NPF\_EBF_t + \beta_4 EG_t + \beta_5 INF_t + \beta_6 RATE_t \tag{6}$$

$$LnDBF_t = \gamma_0 + \gamma_1 LnTPE_t + \gamma_2 ER\_DBF_t + \gamma_3 NPF\_DBF_t + \gamma_4 EG_t + \gamma_5 INF_t + \gamma_6 RATE_t \tag{7}$$

$$LnLBF_t = \delta_0 + \delta_1 LnTPE_t + \delta_2 ER\_LBF_t + \delta_3 NPF\_LBF_t + \delta_4 EG_t + \delta_5 INF_t + \delta_6 RATE_t \tag{8}$$

According to Widarjono (2017), three steps must be done in using the Co-Integration and ECM method, namely: (1) stationarity test, (2) co-integration test, and (3) estimation of the ECM model. The stationarity test is aimed at seeing the similarity in the stationarity level of all research variables, which in this study uses the unit root test with the Phillips-Perron (PP) methods. While the co-integration test is intended to determine whether there is a long-term balance relationship between research variables, this study uses the Engel-Granger (EG) Cointegration Test method. Finally, the ECM model estimation is used to see the short-term effect of the independent variable on the dependent variable and to identify how fast it takes to get the equilibrium value.

Estimation of Eqs. (1) to (8) in the two-step ECM model EG is estimated using the Ordinary Least Squares (OLS) method. According to (Gujarati et al., 2017) the model estimated by the least squares method is said to be Best Linear Unbiased Estimate (BLUE) if it fulfills several classical assumptions such as being free from multicollinearity, heteroscedasticity, and autocorrelation as well as normally distributed residuals. The multicollinearity test uses the Variance Inflation Factor (VIF), the heteroscedasticity test uses the Breusch-Pagan-Godfrey test, and the autocorrelation test uses the Breusch-Godfrey Lagrange Multiplier (LM) test. Meanwhile, the residual data normality test used the Jarque-Bera test.

## 4    Result and Analysis

The growth of Islamic bank financing in Indonesia during the observation period (last quarter of 2014 to the first quarter of 2022) averaged 2.64%. The largest average growth of financing by type was equity-based financing (EBF) growth of 4.1%, followed by debt-based financing (DBF) growth of 1.91%, and finally leasing-based financing (LBF) growth of -1.71%. During the observation period, the LBF experienced a slowdown indicating that this type of financing was beginning to be abandoned, while the EBF continued to dominate. The covid-19 pandemic condition has not in the least affected the growth of Islamic bank financing. Islamic bank financing disbursements in 2020 and 2021 were relatively normal with an average of 385.754 trillion rupiahs per quarter. The slowdown only occurred in the first quarter of 2021 where at that time, Indonesia reached the peak of the pandemic.

Descriptive statistics of each study variable are presented in Table 1. The average ratio of financing to third-party funds during the observation period was 85.98%, above the average loan-to-deposit ratio of Indonesian banks (77.49%) in 2021. This indicates that Islamic banks are performing their intermediation functions very well. The ability
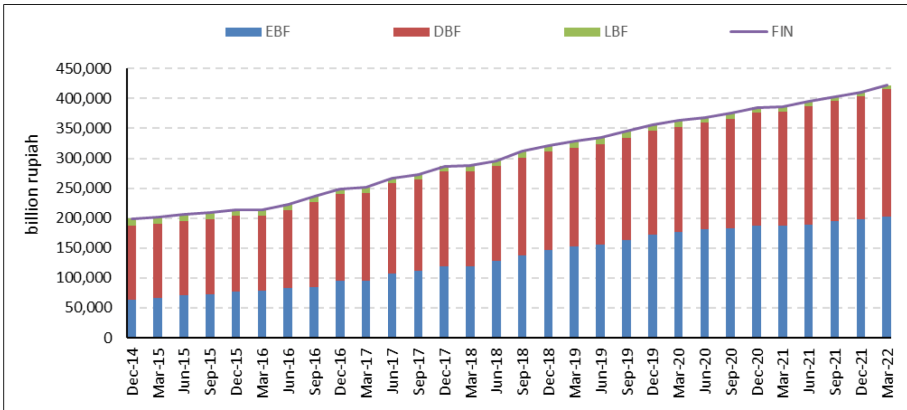
**Fig. 2.** Amount of Sharia Banking Financing in Indonesia by Type. Source: Otoritas Jasa Keuangan (2014–2021)

of Islamic banks to generate profits is indicated by the average return on assets (ROA) of 1.48%, below the ROA of the national banking industry (1.85%). This indicates that Islamic banks are still less competitive in making a profit. Another performance indicator of Islamic banks is non-performing financing (NPF) which averages above 3%, both for overall financing and financing of each type. This non-performing financing is above the national average of only 3%, this is also a record for Islamic banks in maintaining the quality of their financing. The quality of Islamic bank financing is still below the national average, which means that the management ability of Islamic banks in managing financing risks still needs to be improved.

The equivalent rate (ER) shows the number of fees charged to financing customers. The equivalent rate of equity-based financing is smaller than the equivalent rate value of debt-based financing. It is more than four times the equivalent rate of leasing-based financing. This is proof of the increasing demand for equity-based financing compared to other types of financing and proves that Islamic bank customers, besides being rational, are also customers who are price sensitive. It also indicates that profit-sharing financing is more profitable for Islamic bank customers compared to other types of financing.

Macroeconomic indicators in this study include economic growth (EG), inflation (INF), and interest rates (RATE). Indonesia's economic growth before the Covid-19 pandemic in the last ten years has averaged above 5%. While during the observation period it was only 3.92%. This is due to the low economic growth during the pandemic. The lowest economic growth recorded occurred in the second quarter of 2020 at -5.32%. As for inflation and interest rates, it is relatively stable.

**Table 1.** Descriptive statistics

| Variable | Mean | Std. Dev. | Maximum | Minimum |
|---|---|---|---|---|
| FIN | 304.0431 | 72.2913 | 422.4757 | 199.3298 |
| EBF | 133.4645 | 47.1129 | 202.0193 | 63.7412 |
| DBF | 161.0254 | 26.4848 | 213.5432 | 123.4754 |
| LBF | 9.5532 | 1.3129 | 11.6203 | 6.9083 |
| TPF | 353.63 | 100.74 | 536.99 | 212.99 |
| ROA | 1.4813 | 0.3869 | 2.1800 | 0.7900 |
| ER_EBF | 9.1767 | 3.6030 | 17.8700 | 3.5400 |
| ER_DBF | 11.2390 | 1.2420 | 13.7700 | 9.4700 |
| ER_LBF | 42.7013 | 12.3749 | 64.3500 | 22.1500 |
| NPF_TF | 3.6773 | 0.7199 | 5.0300 | 2.5700 |
| NPF_EBF | 3.6683 | 0.7158 | 5.2900 | 2.7600 |
| NPF_DBF | 3.7060 | 0.9498 | 5.4400 | 2.2800 |
| NPF_LBF | 3.4417 | 1.8690 | 7.2300 | 1.4300 |
| EG | 3.9243 | 2.8810 | 7.5800 | −6.1400 |
| INF | 3.4237 | 1.7427 | 8.3600 | 1.3300 |
| RATE | 5.1877 | 1.3838 | 7.7500 | 3.5000 |

**Stationarity Test**

The results of the stationarity test with the root unit test of the Phillips-Perron (PP) method are presented in Table 2. In the level data, almost all variables have a t-statistical probability value of more than 0.05, only inflation is below 0.05. This shows that only the inflation variable is stationary at the level while the remaining variable is not stationary. Testing resumes when all data variables are performed with first differencing and prob results. t-statistics with the attached PP method. The probability of t-statistics is less than 0.05 or even less than 0.01, only two variables are prob. t-stat over 0.05, growth in leasing-based financing (LnLBF) and interest rates (RATE). Even so, the value of the prob. The t-stat of the two is already smaller. For simplicity, it is assumed that all the stationarity data on the first differencing, thus there is no need to differencing to a higher level. This means that the ECM model that will be estimated later uses the degree of integration at the first level (first difference).

**Cointegration Test**

After obtaining the results of the data stationaryity test at the first difference, the next step is to identify whether there is a consistency in the long-term relationship of independent variables to the dependent variables for each equation. The results of the cointegration test were obtained from the residual root unit test of the regression model estimated by the OLS method specified in Eqs. (5) to (8). The results of this regression model estimate will later be used to explain the long-term relationship that occurs after the

**Table 2.** Stationarity test result with Phillips-Perron (PP)

| Variable | Level | | First Difference | |
|---|---|---|---|---|
| | t-Stat | Prob. | t-Stat | Prob. |
| LnFIN | −0.8680 | 0.7838 | −5.3762 | 0.0001 |
| LnEBF | −2.4671 | 0.1336 | −5.6911 | 0.0001 |
| LnDBF | 0.6018 | 0.9873 | −4.5861 | 0.0011 |
| LnLBF | 0.5900 | 0.8581 | −2.4345 | 0.1419 |
| LnTPF | −0.1384 | 0.9358 | −6.9319 | 0.0000 |
| ER_EBF | −1.9518 | 0.3053 | −5.3663 | 0.0001 |
| ER_DBF | −1.1808 | 0.6688 | −3.9660 | 0.0051 |
| ER_LBF | −1.5574 | 0.4910 | −6.2282 | 0.0000 |
| NPF_TF | −0.3422 | 0.9065 | −7.0241 | 0.0000 |
| NPF_EBF | −2.6742 | 0.0906 | −5.9644 | 0.0000 |
| NPF_DBF | −0.2271 | 0.9241 | −6.8800 | 0.0000 |
| NPF_LBF | −2.2033 | 0.2094 | −5.1151 | 0.0003 |
| EG | −2.3082 | 0.1762 | −5.4047 | 0.0001 |
| INF | −3.5814 | 0.0126 | −7.2272 | 0.0000 |
| RATE | −1.5420 | 0.4986 | −2.7031 | 0.0861 |

Note: Ln = natural logarithm

requirements of the cointegration test are met. The results of the OLS method estimates for the four equations are presented in Table 3, while the results of the cointegration test are presented in Table 4.

The results of the cointegration test using the Engel-Granger (EG) cointegration test method with the Phillips-Perron (PP) method showed that the prob. The value of the t-stat is less than 0.01, which means that the residual (EC) has been stationary at the data level with an $\alpha = 1\%$. This indicates the cointegration between research variables in the long term in other words there is a long-term balance between variables. Fluctuations in the relationship between a free variable and a bound variable in the short term will tend to adjust to achieve its long-term equilibrium. This means that the results of the OLS model estimates in Table 3 can be used to explain the long-term equilibrium function of the influence of independent variables on dependent variables.

The long-term equilibrium model for each equation has different results. Nonetheless, there are some similarities, such as the growth of third-party funds (LnTPF) and interest rates (RATE) consistently significantly affecting total financing and all types of financing. Meanwhile, inflation (INF) has consistently had no significant effect on total financing and all types of financing. Profitability (ROA) has a significant effect on alpha 5%, only affecting the growth of equity-based financing and leasing-based financing. The non-performing financing (NPF) variable only has a significant effect on debt-based

**Table 3.** OLS estimation result

| Variable | TF | | EBF | | DBF | | LBF | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Prob. t-Stat | Coef. | Prob. t-Stat | Coef. | Prob. t-Stat | Coef. | Prob. t-Stat |
| C | 1.2627 | 0.1002 | −2.2598 | 0.0476 | 5.8029 | 0.0000 | 12.1072 | 0.0000 |
| LnTPF | 0.8210 | 0.0000 | 1.1123 | 0.0000 | 0.5102 | 0.0000 | −0.2679 | 0.0022 |
| ROA | 0.0357 | 0.0372 | | | | | | |
| ER* | | | −0.0136 | 0.0158 | −0.0010 | 0.8442 | 0.0064 | 0.0000 |
| NPF* | 0.0816 | 0.1740 | −0.0433 | 0.0246 | −0.0287 | 0.6108 | −0.0030 | 0.6910 |
| EG | −0.0034 | 0.0132 | −0.0089 | 0.0040 | 0.0015 | 0.1305 | −0.0019 | 0.6509 |
| INF | −0.0011 | 0.7135 | −0.0087 | 0.3064 | 0.0045 | 0.1627 | 0.0089 | 0.3871 |
| RATE | 0.0166 | 0.0017 | 0.0342 | 0.0051 | −0.0166 | 0.0238 | 0.0332 | 0.0636 |
| R-Squared | 0.9970 | | 0.9920 | | 0.9943 | | 0.9094 | |
| F-Stat | 1,286.2 | | 472.34 | | 668.13 | | 38.481 | |
| Prob (F-Stat) | 0.0000 | | 0.0000 | | 0.0000 | | 0.0000 | |
| DW stat | 1.7571 | | 1.0442 | | 1.5457 | | 1.4141 | |

Note: * by type of financing

financing. Meanwhile, economic growth (EG) affects the growth of total financing and equity-based financing.

The value of the coefficient of determination (R-Squared) of the four long-term equations is relatively high, reaching an average of 99%, meaning that the model formed can explain the influence of the long-term variables lnTPF, ROA, ER, NPF, EG, INF, and RATE on the financing variables up to 99% while the rest is explained by other variables outside the model. This result is also reinforced by the prob. F-stats that are smaller than 0.01 in each model. This suggests that all long-term equation models formed are worth using to explain the influence of independent variables on dependent variables up to $\alpha = 1\%$.

**Table 4.** Cointegration test result: Unit root test residual (EC) with Phillips-Perron (PP)

| Variable EC OLS Model | ADF | |
|---|---|---|
| | t-Statistic | Prob. |
| TF | −5.1033 | 0.0000 |
| EBF | −2.7992 | 0.0068 |
| DBF | −4.1199 | 0.0002 |
| LBF | −3.4739 | 0.0011 |

**Estimation ECM Model**

Based on the results of stationaryity tests and cointegration tests, ECM is formed using the residual OLS model as an error correction (EC) variable. The ECM model estimation results of the four equations are shown in Table 5.. The value of the coefficient of determination of the four models ranges from 40 to 50 percent. This means that the ability of independent variables to explain their effect on dependent variables is not very strong, the maximum is only 50%. The F-test results shown with the probability of F-stat of the four models are only three which are below 0.05, namely the equation with bound variables TF, EBF, and DBF, while for LBF the value is 0.085. These results suggest that the ECM TF, EBF, and DBF models can be used to explain the short-term effect of independent variables on dependent variables.

The error correction model used in this study is the Engel-Granger (EG) two-stroke, model. The EG version of the error correction model is said to be valid if the error correction coefficient (EC) is negative and is declared statistically significant (Engle & Granger, 1987). Based on the ECM estimates in Table 5., the error correction (EC) coefficients of all equations are marked negative, but only EC_FIN, EC_DBF, and EC_LBF are significant, while the EC_EBF coefficients are insignificant. These results validate the use of two-step ECM EG for the ECM FIN, DBF, and LBF equations in describing the short-term and long-term relationships that occur between third-party fund variables, rate equivalents, non-performing financing, inflationary economic growth, and interest rates with each type of financing.

**Classic Assumption Test**

The OLS and ECM regression models used to explain the long-term and short-term effects of the relationship between macroeconomic and microeconomic indicators of Islamic banking on the growth of total financing, equity-based financing, debt-based financing, and leasing-based financing have been validated. As a final condition that both models are statistically good, they both models meet the classic assumption of linear regression models. The classic assumptions that must be met are the freedom of the model from multicollinearity, autocorrelation, and heteroskedasticity, as well as the residual of the model that is normally distributed (normality).

Multicollinearity is a condition of mutual relationships between free variables. This condition can lead to the insignificance of independent variables that correlate with each other. The presence or absence of multicollinearity is used variance inflation factor (VIF) indicator. The value of the VIF tolerated so that multicollinearity does not occur is 10, more than that indicates multicollinearity (Hair et al., 2018). The results of the multicollinearity test for OLS and ECM models of Eqs. (1) to (8) are presented in Table 6. VIF values for OLS models exceeding 10 are found in the EBF and DBF equations, while for ECM none exceed 10. In ECM there is no multicollinearity, whereas, in the OLS model, LnTPF has a VIF value of more than 10, however, both variables still have a significant influence on the dependent variables LnEBF and LnDBF. Although there is multicollinearity, if the two variables have a significant effect, it can be said that the assumption of multilinearity is met (Allison, 2012).

Identification of the presence or absence of autocorrelation between the two models (OLS and ECM) in each financing equation was carried out with the Breusch-Godfrey Lagrange Multiplier (LM) test. Breusch-Godfrey LM test results for all eight equations

**Table 5.** ECM estimation result

| Variable | TF | | EBF | | DBF | | LBF | |
|---|---|---|---|---|---|---|---|---|
| | Coef. | Prob. t-Stat | Coef. | Prob. t-Stat | Coef. | Prob. t-Stat | Coef. | Prob. t-Stat |
| C | 0.0103 | 0.0872 | 0.0254 | 0.0000 | 0.0040 | 0.3932 | −0.0062 | 0.5892 |
| D(LnTPF) | 0.5351 | 0.0033 | 0.3501 | 0.1737 | 0.4118 | 0.0050 | −0.0834 | 0.7827 |
| D(ROA) | 0.0023 | 0.8732 | | | | | | |
| D(ER*) | | | −0.0051 | 0.0045 | 0.0025 | 0.6293 | 0.0013 | 0.2366 |
| D(NPF*) | 0.0440 | 0.3204 | −0.0337 | 0.0308 | −0.0075 | 0.8642 | −0.0031 | 0.5263 |
| D(EG) | −0.0029 | 0.0638 | −0.0047 | 0.0432 | 0.0012 | 0.3167 | −0.0014 | 0.6789 |
| D(INF) | 0.0014 | 0.6065 | −0.0033 | 0.4354 | 0.0035 | 0.2333 | 0.0122 | 0.1570 |
| D(RATE) | 0.0076 | 0.2865 | 0.0135 | 0.2887 | −0.0133 | 0.0955 | 0.0322 | 0.0966 |
| EC(-1) | −0.6297 | 0.0175 | −0.2209 | 0.2962 | −0.7123 | 0.0173 | −0.4200 | 0.0319 |
| R-Squared | 0.5238 | | 0.3927 | | 0.5492 | | 0.4288 | |
| F-Stat | 3.3005 | | 1.9364 | | 3.6542 | | 2.1448 | |
| Prob (F-Stat) | 0.0158 | | 0.0036 | | 0.0098 | | 0.0856 | |
| DW stat | 1.7476 | | 1.7581 | | 1.6981 | | 1.6267 | |

Note: * by type of financing

**Table 6.** Multicollinearity test result: Variance Inflation Factors (VIF)

| Variable | TF | | EBF | | DBF | | LBF | |
|---|---|---|---|---|---|---|---|---|
| | OLS | ECM | OLS | ECM | OLS | ECM | OLS | ECM |
| LnTPF | 8.4347 | 3.9611 | 10.4092 | 5.6246 | 19.9830 | 2.2958 | 6.5083 | 1.6202 |
| ROA | 4.9735 | 2.3431 | | | | | | |
| ER | | | 6.8970 | 1.7518 | 5.5078 | 1.1830 | 2.3764 | 1.4340 |
| NPF | 3.9135 | 1.5921 | 3.2267 | 1.9265 | 7.0065 | 2.0137 | 2.3982 | 1.1934 |
| EGH | 1.6691 | 2.1468 | 1.2622 | 6.0747 | 1.1596 | 1.2417 | 1.8357 | 1.4227 |
| INF | 3.7124 | 1.0576 | 4.1269 | 1.5195 | 4.2470 | 1.0599 | 3.8385 | 1.2250 |
| RATE | 5.3302 | 1.3224 | 4.5312 | 3.3969 | 13.2280 | 1.3816 | 6.8504 | 1.2700 |
| EC(-1) | | 1.9779 | | 5.7451 | | 1.4296 | | 1.2680 |

can be seen in Table 7. The whole value of the prob. The F-stat is more than 0.05 so it can be ascertained that the residual of the entire model has no autocorrelation, so that the assumption of the model is free of autocorrelation is met.

The results of the heteroskedasticity test using the Breusch-Pagan-Godfrey test are shown in Table 8. Prob. The F-stat of all models is more than 0.05 which means the residual of both models of homoskedasticity (not heteroskedasticity). From these results, it can be concluded that the second assumption of the model free of heteroskedasticity has been fulfilled.

The residual normality test of the long-term equation model (OLS) and the short-term equation (ECM) is shown in Table 9. The results of the residual data normality test for all eight models used the Jarque-Fallow test. The result of the probability of t-stat is greater than 0.05, meaning that residual data are normally distributed, so it can be concluded that residual data for all OLS and ECM models are evenly distributed normally. Thus, the assumption of normality has been met.

**Hypothesis Testing**

The third-party fund's regression coefficient (LnTPF) on the entire long-term equation (OLS) has a prob. t-stat of less than 0.01, so it can be said that in the long run, the growth of third-party funds has a significant effect on alpha 1%. However, not all LnTPF regression

**Table 7.** Autocorrelation test result: Breusch-Godfrey

| Model | | F-statistic | Prob. F | Obs*R-squared | Prob. Chi-Square |
|---|---|---|---|---|---|
| TF | OLS | 0.1415 | 0.8689 | 0.3989 | 0.8192 |
| | ECM | 0.4467 | 0.6463 | 1.3025 | 0.5214 |
| EBF | OLS | 2.8453 | 0.0806 | 6.3964 | 0.0408 |
| | ECM | 2.3943 | 0.1182 | 5.8376 | 0.0540 |
| DBF | OLS | 0.3140 | 0.7339 | 0.8711 | 0.6469 |
| | ECM | 0.0588 | 0.9431 | 0.1784 | 0.9147 |
| LBF | OLS | 0.5235 | 0.6012 | 1.5392 | 0.4632 |
| | ECM | 2.3943 | 0.1182 | 5.8376 | 0.0540 |

**Table 8.** Heteroscedasticity test result: Breusch-Pagan-Godfrey

| Model | | F-statistic | Prob. F | Obs*R-squared | Prob. Chi-Square |
|---|---|---|---|---|---|
| TF | OLS | 0.2596 | 0.9501 | 1.9026 | 0.9284 |
| | ECM | 1.0346 | 0.4371 | 7.4366 | 0.3849 |
| EBF | OLS | 1.0036 | 0.4469 | 6.2245 | 0.3985 |
| | ECM | 2.3867 | 0.0580 | 12.8492 | 0.0759 |
| DBF | OLS | 1.3309 | 0.2837 | 7.7315 | 0.2584 |
| | ECM | 0.3593 | 0.9157 | 3.1015 | 0.8755 |
| LBF | OLS | 0.4440 | 0.8417 | 3.1138 | 0.7944 |
| | ECM | 1.2298 | 0.3328 | 8.4254 | 0.2966 |

**Table 9.** Normality test result: Jarque Bera

| Residual Model | | t-statistic | Prob. |
|---|---|---|---|
| TF | OLS | 0.8093 | 0.6672 |
| | ECM | 0.0305 | 0.9849 |
| EBF | OLS | 1.2163 | 0.5444 |
| | ECM | 0.2949 | 0.8629 |
| DBF | OLS | 0.8452 | 0.6554 |
| | ECM | 2.1859 | 0.3352 |
| LBF | OLS | 0.1524 | 0.9266 |
| | ECM | 1.0017 | 0.6060 |

coefficients are positive, LnTPF in the LBF equation is marked negative. In the short-term equation (ECM) the LnTPF regression coefficient in the total financing (TF) and debt-based financing (DBF) equations has a significant effect, while in the equity-based financing (EBF) and leasing-based financing (LBF) equations, they are not significantly defined. From these results, it can be proven that in the long and short term, the growth of third-party funds has a significant positive effect on the growth of total financing and debt-based financing ($H_{1a}$ and $H_{1c}$ are proven). Meanwhile, the growth of third-party funds only has a significant positive effect on the growth of equity-based financing in the long term, not in the short term ($H_{1b}$ is proven). The growth of third-party funds did not have a significant positive effect on the growth of leasing-based financing both in the long term and in the short term ($H_{1d}$ is not proven).

Profitability (ROA) has a significant positive effect on total financing growth (LnTF) in the long term but has no effect in the short term ($H_2$ is evident). The equivalent rate of equity-based financing (ER_EBF) has a significant negative effect on the growth of equity-based financing (LnEBF) in the long and short term ($H_{3a}$ proven). Meanwhile, the equivalent rate of debt-based financing (ER_DBF) and the equivalent rate of leasing-based financing (ER_LBF) did not have a significant negative effect on the growth of financing, both in the long and short term ($H_{3b}$ and $H_{3c}$ were not proven).

Non-performing equity-based financing (NPF_EBF) alone has a significant negative effect on the growth of equity-based financing (LnEBF) both in the long term and in the short term ($H_{4b}$ proven). While non-performing financing for total financing, debt-based financing, and leasing-based financing have no significant effect ($H_{4a}$, $H_{4c}$, and $H_{4d}$ are not proven).

Economic growth (EG) only has a significant effect on total financing growth (LnTF) and equity-based financing (LnEBF) growth, both in the long and short term. But the influence of both is negative, so it does not correspond to the hypothesis of the study ($H_{5a}$, $H_{5b}$, $H_{5c}$, and $H_{5d}$ are not proven). As for inflation (INF), it has no significant effect on any financing growth, both in the long and short term ($H_{6a}$, $H_{6b}$, $H_{6c}$, and $H_{6d}$ are not proven).

The last macroeconomic indicator in this study is the interest rate (RATE). Based on the t-test, almost all interest rate variables in each financing equation, both short-term and

long-term, have a significant effect on financing growth. The effect of interest rates on total financing, equity-based financing, and leasing-based financing has a positive effect ($H_{7a}$, $H_{7b}$, and $H_{6d}$ are proven), while on debt-based financing the effect is negative ($H_{6c}$ is not proven).

## 5 Discussion

The growth of third-party funds has a significant positive effect on financing growth, both total financing and the growth of each type of financing. The rapid increase in third-party funds will encourage the distribution of financing for equity-based financing and debt-based financing. This finding is corroborated by Annisa & Yaya (2015), Arnan & Kurniawasih (2014), Destiana (2016), Ispad (2019), Jamilah (2016), Kalkarina et al. (2016) and Kurniawanti & Zulfikar (2014) which state that the greater the growth of third party funds, the greater the equity-based financing that banks will provide to customers. This is similar to the findings of Azka & Wibowo (2018), Dwijayanty (2018), and Yanis (2015) which state that the greater the growth of third-party funds, the greater the growth of debt-based financing.

The increase in the amount of financing that can be disbursed to customers due to an increase in the number of third-party funds is quite elastic. In the short term, every 1% increase in the number of third-party funds will encourage the growth of total financing by 0.82%. Meanwhile, in the long term, a 1% growth in third-party funds can increase total financing by 0.54%. The growth of third-party funds has the most elastic impact on the growth of equity-based financing in the long term, not in the short term. The increase in equity-based financing has a greater impact than the increase in third-party fundraising. This means that in the long term, the portion of equity-based financing will shift to the portion of debt-based financing.

For the record, the growth of third-party funds is the most influential factor compared to other factors. So that the growth of third-party funds in Islamic banks becomes the dominant factor that can be optimized in encouraging financing growth.

The equivalent rate of equity-based financing has a negative effect on financing growth. The lower the equivalent rate of equity-based financing, the higher the growth of equity-based financing. The impact caused by the equivalent rate is quite consistent in the short and long term. This result is in line with the findings of Annisa & Yaya (2015), Giannini (2013), Kiswanto (2013), and Kurniawanti & Zulfikar (2014). The low equivalent rate does reduce the potential revenue that will be received by Islamic banks, but if the growth of equity-based financing can be encouraged even more rapidly, it is not impossible that Islamic banks' revenue from the financing will be even greater.

Non-performing financing has a negative effect on the growth of equity-based financing. This can be explained that when non-performing financing increases, management will be more careful in expanding financing and will focus more on activities to maintain financing quality and make improvement and recovery efforts. This will indirectly reduce the efforts and focus of banks to expand the distribution of equity-based financing. The high level of non-performing financing will make Islamic banks more careful in providing financing, and it is possible that banks will reduce their financing portion. The results of this study are supported by Annisa & Yaya (2015), Furqaini & Yaya

(2016), Ispad (2019), and Riyanto (2016) which show that non-performing financing has a negative effect on equity-based financing.

The impact of a decrease in equity-based financing due to an increase in non-performing financing in the short and long term is highly inelastic. In the short term, every 1% increase in the NPF ratio will reduce financing growth by 0.034%. Meanwhile, in the long term, every 1% increase in the NPF ratio will reduce the growth of profit-sharing financing by 0.043%. Efforts to maintain the quality of profit-sharing financing are a big homework for Islamic banks. The decline in non-performing financing indicates an increase in the quality of financing and this is what the Islamic banking industry must do, whether in order to increase financing growth or not.

Of the three macroeconomic indicators, only economic growth and interest rates have an effect on financing. For economic growth alone, the findings are contrary to the research hypothesis. This is possible given the unhealthy economic growth conditions in the last two years due to the pandemic. Meanwhile, interest rates have a positive effect on the growth of total financing, equity-based financing, and leasing-based financing. This result is corroborated by the findings of Hafizh et al. (2020), and Mubarok et al. (2020) which state that an increase in interest rates will encourage the development of equity-based financing. Meanwhile, the results of this study also found that an increase in interest rates would reduce debt-based financing.

## 6 Conclusion

The microeconomic condition of the Islamic banking industry as reflected by the growth of third-party funds is the main determinant in encouraging the growth of the three types of financing, in addition to non-performing financing and the equivalent rate. Non-performing financing and the equivalent rate only have an impact on the growth of equity-based financing. The improvement in non-performing financing and the low equivalent rate were able to encourage the growth of equity-based financing. The conditions of the three microeconomic indicators of Islamic banks indicate a shift in the portion of the type of financing that was previously dominated by debt-based financing to equity-based financing.

Macroeconomic conditions reflected by economic growth are indicators for controlling the growth of equity-based financing, while interest rates can be used as macroeconomic indicators in controlling the growth of the three types of Islamic bank financing. The effect of interest rates on the three types of Islamic bank financing is different. The high-interest rate will encourage the growth of equity-based financing, but on the other hand, it will slow down the amount of debt-based financing.

It is advisable for Islamic banks to focus more on raising third-party funds in order to encourage the growth of their financing because the still small market share of Islamic banks indicates the large potential for raising funds that have not been explored. In addition to efforts to raise third-party funds, Islamic banks must be more expansive in channeling financing by maintaining the equivalent rate of equity-based financing and maintaining the quality of its financing. This is expected to encourage the ability of banks to generate profits.

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