

Profitability Response of Sharia Banking on Macroeconomic Variable Conjunctions in Indonesia with Vector Error Correction Model (VECM) Approach

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ABSTRACT

Bank profitability can be determined by factors that can be controlled by management and factors beyond the control of company management. The factors that can be controlled by management are factors that describe the policies and decisions of the bank's management itself, such as fundraising, capital management, liquidity management, and cost management. Meanwhile, factors beyond management's control include environmental factors and bank characteristics, environmental factors include market structure, regulation, inflation, interest rates, and market growth. Conditions in national Islamic banking have slow growth, it is suspected that the sluggish growth rate of Islamic banking is more due to factors that cannot be controlled. This study aims to analyze the response of Islamic banking profitability to the conjuncture of macroeconomic variables in Indonesia. This research was conducted in 2021, using quantitative methods that are causal and secondary data types sourced from the Indonesia Stock Exchange (IDX) with purposive sampling from 2010 to 2019. The analytical tool used in this study is the Vector Autoregression (VAR) method. If the data used is stationary at the level, but if the data used is stationary at the first difference, then proceed with the Vector Error Correction Model (VECM) method. The results of the Impulse Response Function (IRF) show that the conjuncture of national income, interest rates, inflation, the amount of interest in circulation and the exchange rate fluctuates at the beginning of the period. The fluctuating conjuncture at the beginning of the period identified that these variables in the short term experienced instability. However, in the long term these shocks began to stabilize and began to reach equilibrium in period 17. National income and money supply responded positively, while interest rates, inflation and exchange rates responded negatively to the profitability of Indonesian Islamic banking. Suggestion Bank Indonesia should be able to make policies that are expansive towards the existence of Islamic banks so that Islamic banks can compete with other financial institutions while interest rates, inflation and exchange rates responded negatively to the profitability of Indonesian Islamic banking. Suggestion Bank Indonesia should be able to make policies that are expansive towards the existence of Islamic banks so that Islamic banks can compete with other financial institutions while interest rates, inflation and exchange rates responded negatively to the profitability of Indonesian Islamic banking. Suggestion Bank Indonesia should be able to make policies that are expansive towards the existence of Islamic banks so that Islamic banks can compete with other financial institutions.

Keywords: Islamic Banking, Macroeconomics, Profitability, VECM

1. INTRODUCTION

The development of the national Islamic economy is inseparable from the role and existence of Islamic banking. The growth in the Islamic banking sector, we can see from the easier it is to find Islamic banking around us. The increasing number of sharia banking offices, whether central, branch, or sub-offices, shows the development of Islamic banking in Indonesia which continues to grow in line with economic developments.

This The development of Islamic banking in Indonesia is not only reviewed in terms of quantity, but must be reviewed in terms of quality. The quality can be seen from the increasing number of Islamic banks today. Meanwhile, in terms of the quality of the development of Islamic banking in terms of the financial performance it has achieved. Quality review is a must because in the banking industry financial performance is an important factor that influences the development of a bank. In fact, in general, the financial performance of the banking industry will greatly affect the economic condition of a country.

Total assets and profit for the year is an indicator used to measure the bank's financial performance. In the report from the Financial Services Authority (2019), it is known that the total assets of Islamic banking during 2012 to 2018 tend to increase every year. In 2018 the total assets of Islamic banking could reach up to Rp. 477,327 billion, or it can be said to have more than doubled when compared to the previous six years in 2012, which was Rp. 195,018 billion. In terms of profit for the year, sharia banking in 2013 experienced a significant increase compared to the previous year, where in 2012 the profit for the year was Rp. 3,423 billion, then in 2013 it increased to Rp. 4,364 billion. However, in 2014, there was a decline in the profit of Islamic banking to Rp 2.

The decline in profit for the year of Islamic banking in 2014 had actually been predicted by several experts several years earlier. They stated that the growth of Islamic banking in the next year (2014) will not be encouraging or sluggish. The Islamic Economic Community (MES) stated that the decline in Islamic banking growth in 2014 was due to uncertain global conditions. Bank profitability can be determined by factors that can be controlled by management (internal) and factors beyond the control of company management (external). The factors that can be controlled by management are factors that describe the policies and decisions of the bank's management itself, such as fundraising, capital management, liquidity management, and cost management. Meanwhile, factors beyond management's control include environmental factors and bank characteristics, environmental factors include market structure, regulation, inflation, interest rates, and market growth (Balanchandher, 2010). Several factors

that cannot be controlled by company management are macroeconomic factors, such as national income, inflation, money supply, rupiah exchange rate and so on. Controlling these external factors is increasingly difficult with the open economic system that Indonesia currently adopts. The open economic system makes the global economic impact on Indonesia's macroeconomic conditions even greater. Several factors that cannot be controlled by company management are macroeconomic factors, such as national income, inflation, money supply, rupiah exchange rate and so on. Controlling these external factors is increasingly difficult with the open economic system that Indonesia currently adopts. The open economic system makes the global economic impact on Indonesia's macroeconomic conditions even greater. Several factors that cannot be controlled by company management are macroeconomic factors, such as national income, inflation, money supply, rupiah exchange rate and so on. Controlling these external factors is increasingly difficult with the open economic system that Indonesia currently adopts. The open economic system makes the global economic impact on Indonesia's macroeconomic conditions even greater.

2. MATERIALS AND METHODS

The object of research is the Indonesian Islamic banking industry. This research activity was carried out in September 2021. The type of research used is quantitative research. The nature of this research is causal associative, namely research that aims to determine the relationship or influence of one variable on other variables. Sampling was carried out using the purposive sampling method. The sample in this study includes Islamic banking financial data, especially data on return on assets (ROA), national income, interest rates, inflation, money supply and exchange rates during 2010 until 2019 which is taken on a monthly basis. The consideration used in determining this sample is that the data is the most updated data for the last 10 years. Thus the total number of samples in this study was 120 samples, with data in the form of Gross Domestic Product, interest rates, inflation, money supply and exchange rates through the official website of Bank Indonesia and the Central Bureau of Statistics.

The analytical tool used in this study is the Vector Autoregression (VAR) method if the data used is stationary at the level, but if the data used is stationary at the first difference, then the Vector Error Correction Model (VECM) method is used. The data will be processed using Eviews 7 and Microsoft Excel software.

3. RESULTS AND DISCUSSION

3.1. VECM Model Estimation Results

After several stages of testing, the estimation results of the VECM model are obtained as shown in the following table 1:

Table 1. VECM Model Estimation Results

Variable	Coefficient	t-statistics
GDP	0.246	5.025
RATE	0.613	2,515
INF	0.305	2,374
JUB	0.000004	7,358
EXCHA NGE RATE	-0.000003	-2,021

Source: secondary data processed

To test the significance of the effect of the independent variables (national income, interest rates, inflation rates, money supply and exchange rates) on the dependent variable (Islamic banking profitability) was carried out using a t-test, namely by comparing the t-statistical value with the t-table value. The test is carried out on two sides so that if the value of t statistic is less than the value of t table or -t statistic is greater than -t table, then Ho is accepted and Ha is rejected and vice versa if the value of t statistic is greater than the value of t table or -t statistic is smaller from -t table, then Ho is rejected and Ha is accepted. If you accept Ho, it means that the independent variable has no effect on the dependent variable. The estimation results of the VECM model are described as follows:

- The estimation results of the VECM (long-term) model show that the t-statistical value at lag 1 of the national income variable (GDP) is 5.025. The test was carried out in two ways using a significance probability of 5% (0.05) and df = 113 the t-table value was 1.981. The test results show that the statistical t value is greater than the t table value (5.025 > 1.981). Thus it can be said that national income in the long term has a significant influence on the profitability of Indonesian Islamic banking.
- The estimation results of the VECM (long-term) model show that the t-statistic value at lag 1 of the interest rate variable (RATE) is 2.515. The test was carried out in two ways using a significance probability of 5% (0.05) and df = 113 the t-table value was 1.981. The test results show that the value of t statistic is greater than the value of t
- table (2.515 > 1.981). Thus it can be said that interest rates in the long term have a significant influence on the profitability of Indonesian Islamic banking.
- The estimation results of the VECM (long-term) model show that the t-statistic value at lag 1 of the inflation variable (INF) is 2,374 The test is carried out on two sides using a significance probability of 5% (0.05) and df = 113 the t-table value is obtained 1,981. The test results show that the t-statistical value is greater than the t-table value (2.374 > 1.981). Thus it can be said that the inflation rate in the long term has a significant influence on the profitability of Indonesian Islamic banking.
- The estimation results of the VECM model (long term) show the t-statistical value at lag 1 of the money supply variable (JUB) of 7,358 The test was carried out on two sides using a significance probability of 5% (0.05) and df = 113 obtained the t-value table 1,981. The test results show that the statistical t value is greater than the t table value (7.358 > 1.981). Thus it can be said that the money supply in the long term has a significant influence on the profitability of Indonesian Islamic banking.
- The estimation results of the VECM (long-term) model show the t-statistical value at lag 1 of the exchange rate variable (EXCHANGE) is -2.021. The test was carried out in two ways using a significance probability of 5% (0.05) and df = 113 the t-table value was 1.981. The test results show that the value of -t statistic is smaller than the value of -t table (-2.021 < -1.981). Thus, it can be said that the long-term exchange rate has a significant influence on the profitability of Indonesian Islamic banking.

3.2. Impulse Response Function (IRF) Analysis

IRF analysis is used to find out how long it takes the dependent variable to respond to changes in the independent variable and finally return to the equilibrium point before the shock occurs. In this model, the response of changes in each variable to the presence of new information is measured by one standard deviation. The horizontal axis is the time in the next day period after the shock, while the vertical axis is the response value.

Fundamentally, in this analysis, it will be known the positive or negative response of a variable to other variables. Responses in the short term are usually quite significant and are likely to change. Meanwhile, in the long term, the response tends to be consistent and keeps getting smaller. Impulse Response provides an overview

of how the response of a variable in the future if there is a disturbance in one other variable. The results of the Impulse Response (IRF) test are described as follows:

1. Impulse Response (IRF) analysis of national income (GDP) to the shock to profitability of Indonesian Islamic banking (ROA)

From the results of the Impulse Response (IRF) analysis test, it can be explained that the GDP shock of one standard deviation in period 1 has not had an impact on ROA, but in period 2 the shocks have begun to respond to ROA with a negative trend. However, in the 3rd period the response increased again but entering the 4th period the response began to decrease again. Then the response began to move up in the 5th period and then the downward response continued to occur entering the 6th to the 13th period. The response began to stabilize after entering the 17th period.

2. Impulse Response (IRF) analysis of interest rates (RATE) to shocks in Indonesian Islamic banking profitability (ROA)

To find out the results of the impulse response (IRF) analysis of interest rates (RATE) to the profitability shock of Indonesian Islamic banking (ROA) it is explained that based on the results of the Impulse Response (IRF) analysis test above, it can be explained that the RATE shock of one standard deviation in period 1 has not given any impact on ROA. Then ROA responds to interest rate shocks (RATE) with a negative trend in period 2 and continues to decline until period 3. Entering the 4th period, the increasing response remains in a negative trend. Entering the 5th period the response continued to decline until the 12th period. The response began to stabilize after entering the 16th period.

3. Impulse Response Analysis (IRF) of inflation (INF) to shocks in Indonesian Islamic banking profitability (ROA)

To find out the results of the impulse response (IRF) analysis of inflation (INF) on the profitability shock of Indonesian Islamic banking (ROA) explained based on the results of the Impulse Response (IRF) analysis test above, it can be explained that the INF shock of one standard deviation in period 1 has not had an impact on ROA. Then ROA responds to inflationary shocks (INF) with a negative trend in period 2 then enters the 3rd period, the response continues to increase until the 5th period. Entering the 5th period the response decreased until the 14th period. The response began to stabilize after entering the 16th period.

4. Impulse Response (IRF) analysis of the money supply (JUB) to the shock to profitability of Indonesian Islamic banking (ROA)

To find out the results of the impulse response (IRF) analysis of the money supply (JUB) on the profitability shock of Indonesian Islamic banking

(ROA) explained based on the results of the Impulse Response (IRF) analysis test above, it can be explained that the JUB shock of one standard deviation in period 1 has not given any impact on ROA. Then ROA responded to the shock in the money supply (JUB) with a positive trend in period 2 and the response continued to increase until period 4. Entering the 5th period the response began to decline until the 7th period. The 8th period of response increased again up to the 16th period. The response began to stabilize after entering the 17th period.

5. Impulse Response (IRF) analysis of the exchange rate (KURS) on the shock to profitability of Indonesian Islamic banking (ROA)

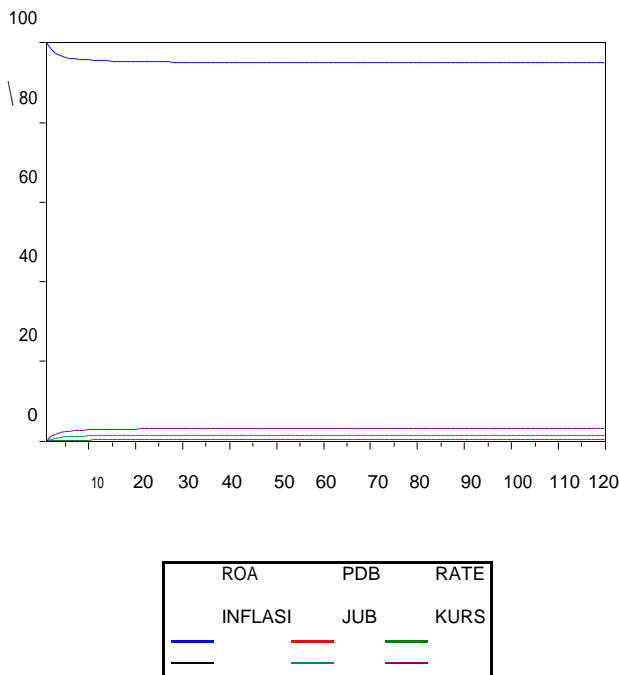
To find out the results of the impulse response (IRF) analysis of the exchange rate (KURS) on the profitability shock of Indonesian Islamic banking (ROA), it is explained that the results of the Impulse Response (IRF) analysis test above can be explained that the exchange rate shock of one standard deviation in period 1 has not had an impact against ROA. Then ROA responds to shocks in the money supply (JUB) with a negative trend in period 2 and the response continues to decline until period 4. Entering the 5th period the response increased again up to the 6th period. In the 8th period the response decreased again until the 15th period. The response began to stabilize after entering the 16th period.

3.3 Forecast Error Variance Decomposition (FEVD) Analysis

After testing the impulse response analysis, the next step will be to analyze the model test through forecast error variance decomposition. Variance decomposition is used to compile forecast error variance of a variable, namely how big is the difference between the variance before and after the shock, both shocks originating from oneself and shocks from variables from other variables to see the relative influence of research variables on other variables. The variance decomposition procedure is to measure the percentage of surprises for each variable. Variance decomposition model is used to provide a detailed explanation of how changes in one variable are affected by changes in other variables.

FEVD has the advantage of explaining the extent to which an economic variable plays a role in explaining other economic variables when changes or shocks occur in the VAR system. It aims to explain the contribution of each variable to shocks to the main endogenous (bound) variables observed. In this study, FEVD also aims to explain how big the percentage contribution of each variable shock to national income (GDP), interest rates (RATE), inflation (INF), money supply (JUB) and exchange rate (KURS) in influencing profitability. Indonesian Islamic Banking (ROA).

Changes that occur in the variables are indicated by changes in the error variance. The results of the forecast error variance decomposition (FEVD) test are explained as follows:



Source: secondary data processed

Figure 1. Variance Decomposition Analysis Test Results

From the figure 1 of variance decomposition test results above, it can be explained that in the first period, Islamic banking profitability (ROA) was strongly influenced by the ROA shock itself by 100 percent. Meanwhile, the variables of national income (GDP), interest rates (RATE), inflation (INF), money supply (JUB) and exchange rate (KURS) have not had an effect on ROA. Then starting from period 2 to period 120, the proportion of ROA shocks itself is still large, but ROA shocks provide a decreasing proportion of influence on ROA itself. The description of the forecast error variance decomposition (FEVD) test for each variable is explained as follows:

1. Forecast error variance decomposition test of Indonesian Islamic banking profitability (ROA) variables

To see the results of the forecast error variance decomposition test, the ROA variable explained that in the second period the ROA shock to ROA itself decreased by contributing 98.45 percent and experienced a shock decrease of 97.36 percent in the third period. Then the ROA shock to ROA itself continued to decline until the 56th period. ROA shocks began to stabilize after the 57th period to the 120th period with a contribution in the range of 94.99 percent to 94.92 percent. To clarify this analysis can be seen in appendix 10.

2. Forecast error variance decomposition test for national income (GDP) variables

To see the results of the forecast error variance decomposition test of the national income variable (GDP), it is explained that in the second period the GDP shock to ROA increased by contributing 0.011 percent. Then in the third period, the shock increased with a contribution of 0.058 percent. GDP shock to ROA continued to increase until the 9th period with a contribution of 0.079 percent. GDP shocks to ROA began to stabilize after entering the 10th to 120th periods with contributions in the range of 0.080 percent to 0.089 percent.

3. Forecast error variance decomposition test for RATE variable

To see the results of the forecast error variance decomposition test for the interest rate variable (RATE), it is explained that in the second period the RATE shock to ROA has increased by contributing 0.039 percent. Then in the third period, the shock increased sharply with a contribution of 0.125 percent. Shock RATE to ROA continued to increase until the 46th period with a contribution of 0.300 percent. RATE shocks to ROA began to stabilize after entering the 65th to 120th periods with contributions in the range of 0.301 percent to 0.310 percent.

4. Forecast error variance decomposition test for INF variable

To see the results of the forecast error variance decomposition of the inflation variable (INF) it is explained that in the second period the INF shock to ROA has increased by contributing 0.021 percent. Then in the third period, the shock increased with a contribution of 0.028 percent. INF shocks to ROA continued to increase until the 16th period with a contribution of 0.039 percent. INF shocks to ROA began to stabilize after entering the 16th to 120th periods with contributions in the range of 0.040 percent to 0.044 percent.

5. JUB. variable forecast error variance decomposition test

To see the results of the forecast error variance decomposition test for the money supply variable (JUB), it is explained that in the second period the JUB shock to ROA increased by contributing 0.307 percent. Then in the third period, the shock increased with a contribution of 0.673 percent. The JUB shock to ROA increased sharply until the 85th period with a contribution of 1.439 percent. JUB shocks to ROA began to stabilize after entering the 86th period to the 120th period with contributions in the range of 1.440 percent to 1.447 percent.

6. Test the forecast error variance decomposition of the EXCHANGE variable

To see the results of the forecast error variance decomposition test of the exchange rate variable (EXCHANGE), it is explained that in the second period the shock of the exchange rate towards ROA has increased by contributing 1.167 percent.

Then in the third period, the shock increased with a contribution of 1.744 percent. Exchange rate shocks to ROA increased sharply up to the 43rd period with a contribution of 3.109 percent. Exchange rate shocks to ROA began to stabilize after entering the 44th period to the 120th period with a contribution in the range of 3.112 percent to 3.181 percent.

Based on the results of the analysis above, it is known that the first largest contribution in explaining the diversity of Islamic banking profitability (ROA) is the exchange rate (KURS). This means that there are indications that foreign transactions in the long term will continue to affect ROA. The increasing number of foreign transactions affects the foreign currency owned by Islamic banking. The contribution of foreign transactions carried out by Islamic banking continues to increase in explaining the diversity of ROA. However, if in transactions more money flows out, the profitability (ROA) will be lower. This can happen because the greater the outflow causes the less (reduced) foreign currency owned by Islamic banking.

The smallest contribution in explaining the diversity of profitability of Indonesian Islamic banking is inflation (INF). This means that when there is an increase in inflation, it will directly increase the profitability of Islamic banking. This can happen because an increase in inflation tends to increase interest rates. Meanwhile, in Islamic banking operations, the level of interest recognizes interest rates, so that when interest rates rise, people prefer to borrow in Islamic banking where the cost of borrowing is determined by profit sharing rather than conventional banking whose costs follow the increase in interest rates. However, the contribution of inflation is small compared to the contribution of other variables.

3.4 Data Interpretation

Based on the results of the data analysis, the discussion on data interpretation is described as follows:

3.4.1 The Effect of National Income on Profitability of Indonesian Islamic Banking

Throughout 2010 to 2019 the increase in Indonesia's national income tends to be followed by an increase in the profitability of Indonesian Islamic banking. This can happen because the increase in national income during 2010 to 2019 tends to be followed by an increase in people's desire to save, even though they only use a small part of their income.

People who have an income are more concerned with meeting their consumption needs than the desire to save. The tendency of people to consume is greater than the tendency to save. This is reinforced by data on Gross Domestic Product (GDP) According to Expenditures in 2018 published by the Central Bureau of Statistics (BPS) which states that household final consumption each year has an average contribution of 55% to GDP

according to annual expenditure which tends to increase. This data explains that if we look at national income from the expenditure side, it is clear that household consumption has the largest contribution and tends to continue to increase.

3.4.2 The Effect of Interest Rates on Profitability of Indonesian Islamic Banking

The increase in Bank Indonesia interest rates led to an increase in loan interest rates at conventional banks. If this happens, the loans made by the community will switch to Islamic banks whose costs are not based on interest rates. This condition causes interest rates to have a positive influence on the profitability of Islamic banking. In Islamic banking, there is no interest, so even though there is an increase in interest rates, customers only think of it as an increase in costs. In addition, in calculating the cost, Islamic banking determines by using profit sharing (ratio) on a percentage basis, so that the percentage will remain relatively unchanged even though there is an increase in interest rates.

With the calculation of profit sharing (ratio), changes in Bank Indonesia interest rates tend to affect the profitability of Islamic banking. These results are consistent with research conducted by Aria Muharam (2009) which found that the BI rate had no effect on operating profit of Islamic banks.

3.4.3 Effect of Inflation on Profitability of Indonesian Islamic Banking

Theoretically, inflation has a negative effect on the profitability of banks, especially conventional ones. This can happen because an increase in inflation will not only reduce people's desire to save, but also increase interest rates. If the interest rate rises, then the distribution of loans made by the bank will decrease. This decrease in lending will reduce the bank's income and ultimately reduce its profitability.

This condition does not necessarily occur in Islamic banking, inflation may have a positive influence on the profitability of Islamic banking in Indonesia. This can happen because Islamic banking does not recognize the concept of interest, so that rising inflation which causes an increase in interest rates does not necessarily reduce the profitability of Indonesian Islamic banking. This is one of the advantages of Islamic banking that applies the concept of profit sharing and not based on the prevailing interest rate. Rising inflation causes people to need more money. Borrowing from conventional banks will incur high interest costs (caused by rising inflation). But it's different if you borrow from Islamic banks that don't know the concept of interest. the borrower will only be charged a fee (ratio) on a percentage basis based on the agreement between the borrower and the Islamic bank. Thus, an increase in inflation that causes an increase in interest rates at conventional banks does not necessarily cause a change in the percentage ratio set by Indonesian Islamic banking.

3.4.4 The Influence of the Money Supply on the Profitability of Indonesian Islamic Banking

Mechanically, the increase in the money supply will be followed by a decrease in the interest rate. This reduction in interest rates will increase lending or loans made by banks, especially conventional banks. But this condition does not necessarily apply to Islamic banking. The number of people who take loans in Islamic banking because the fees charged are not based on the prevailing interest rate. The rise and fall of interest rates will not affect the costs set by Islamic banking. The fees determined are based on the ratio system and the agreement between the customer and the Islamic bank. People prefer Islamic banks because the fees set are more stable than the fees set according to the interest rate.

3.4.5 The Effect of Exchange Rate on Profitability of Indonesian Islamic Banking

The exchange rate or foreign currency is one of the indicators used to measure the success of a country's economy. The stronger the value of a country's currency indicates the higher the economic activity and economic growth of that country. The stronger the currency value encourages both domestic and foreign investors to invest in the country. The increasing investment will have an impact on income and at the same time the profitability of the bank as an intermediary for these investment activities.

The foreign exchange rate is one of the factors that affect the profitability of Indonesian Islamic banking. This can happen because in their activities, Islamic banks also provide foreign exchange buying and selling services. The existence of the influence of currency exchange rates on bank profitability identifies if the exchange rate appreciates or depreciates, it will have an impact on banking profitability. The strengthening of the rupiah exchange rate against the US dollar will increase the profitability of Islamic banks. That is, if the value of the domestic currency is higher than the value of the foreign currency, it will lower the prices of imported goods. Lower prices will have the potential to boost the economy in the real sector. The increase in the economy in the real sector will encourage people to invest in this sector and result in an increase in the level of banking profitability. Vice versa, fluctuations in the exchange rate and expectations of large fluctuations in rupiah depreciation will also cause bank debtors to experience business difficulties, with subsequent consequences of not being able to pay debts to the bank. As a result, banks experience liquidity difficulties and in

the end the level of profit (profitability) of Islamic banks decreases.

4. CONCLUSION

The results of the Impulse Response Function (IRF) show that shocks to national income, interest rates, inflation, the amount of interest in circulation and the exchange rate fluctuate at the beginning of the period. Fluctuating shocks at the beginning of the period identified that these variables in the short term experienced instability. However, in the long term these shocks began to stabilize and began to reach equilibrium in period 17. National income and money supply responded positively, while interest rates, inflation and exchange rates responded negatively to the profitability of Indonesian Islamic banking.

The results of the Forecast Error Variance Decomposition (FEVD) show that the largest contribution in explaining the diversity of profitability of Indonesian Islamic banking is the exchange rate, followed by the money supply, interest rates, national income and the smallest contribution is inflation. Thus it can be said that the most dominant factor affecting the profitability of Indonesian Islamic banking is the exchange rate.

AUTHORS' CONTRIBUTIONS

In previous studies to examine the causal relationship of macroeconomic variables to profitability in Islamic banking using multiple regression models so that the interrelation between variables cannot be seen. This study uses Forecast Error Variance Decomposition (FEVD) which has the advantage of explaining the extent of the role of macroeconomic variables in explaining profitability variables when changes or shocks occur in the VAR system. It aims to explain the contribution of each variable to shocks to the main endogenous (bound) variables observed.

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