Interaction of Macroeconomic Variable Shocks and Monetary Policy Interventions on the Profitability of Sharia Commercial Banks in Indonesia

Mohammad Aliman Shahmi1

1Universitas Islam Negeri Mahmud Yunus, Indonesia

ABSTRACT

Background. Economic growth and financial development in Indonesia are supported by developments in the Islamic banking industry. The business continuity of Islamic banking is determined by financial performance, which is measured by the level of profitability. The profitability of Islamic commercial banks is thought to be influenced by macroeconomic variables and monetary policy interventions.

Purpose. This study aims to analyze the effect of shocks on macroeconomic variables, including the real effective exchange rate and consumer price index, and monetary policy intervention through the policy instrument of the Indonesian central bank's benchmark interest rate, namely the BI Rate, and the effect of the capital adequacy ratio on the profitability of Islamic commercial banks in Indonesia in the short and long term.

Method. This study employs error-correction model analysis to completely utilize secondary data from January 2015 to May 2022. Data gathered from the Financial Services Authority's (OJK) Sharia Banking Statistics and Fred Economic Data (FED)

Results. The research results show that the real effective exchange rate and consumer price index affect the profitability of Indonesian commercial banks in the long term but do not have a significant effect on the profitability of Islamic commercial banks in the short term. Monetary policy does not have a significant effect in the short or long term. Meanwhile, the capital adequacy ratio has a significant influence on the profitability of Islamic commercial banks in the short and long term.

Conclusion. Macroeconomic variable shocks have the ability to disrupt banking performance in the short term, and this situation shows that banking management has not put flexible policies and a strategic approach to short-term changes in place. Short-term changes are still managed from the standpoint of handling internal conditions, however management is fairly effective at controlling capital adequacy.

KEYWORDS

Macroeconomics, Monetary, Profitability

INTRODUCTION

Financial development in Indonesia is supported by the development of the banking industry. The existence of banking in the economy is the main support for economic development in Indonesia. As a country with a majority Muslim population, the Islamic banking system is seen as having a strategic position in the national economy, so that the development of Islamic banking is assumed to have a central role in determining the direction of financial development in Indonesia.
The growth of Islamic commercial banks is a significant factor in boosting Indonesia's banking sector and the development of the Islamic banking sector in general. The possibilities for the development of Islamic commercial banks in Indonesia are showing a good trend, even though they are still viewed as a substitute for traditional commercial banks. This indicates that the general public's interest in adopting Islamic bank services has started to rise.

**Figure 1**

Profitability trends for Indonesian Islamic commercial banks from 2016 to 2021

![Profitability trends for Indonesian Islamic commercial banks from 2016 to 2021](chart.png)

*Source: Financial Services Authority's (OJK) Sharia Banking Statistics*

Despite the favorable trend that has begun to emerge in Indonesia's establishment of Islamic commercial banks, these institutions' operations have not yet produced the expected outcomes. Commercial banks are profitable when the ROA value is greater than 15%, according to The Central Bank of Indonesia Regulation No. 13/1/PBI/2011. Based on profitability data for Indonesian Islamic commercial banks from 2016 to 2021, the average ROA is 1.29%, indicating that the circumstances for profitability for Indonesian commercial banks have not surpassed the limit imposed by Bank Indonesia regulations. This demonstrates that Indonesian Islamic commercial banks' profitability levels are not at an appropriate level.

According to the data in Figure 1, it is necessary to implement the best macro- and micro-policies to ensure the profitability of Islamic commercial banks in Indonesia. Macroeconomic policy is a political strategy that controls outside forces that have an impact on a nation's financial standing. Hussain et al., (2023) assert that shocks and uncertainties in the macroeconomic environment have an impact on the financial sector's conditions. Any changes in macroeconomic variables have a big effect on how financial institutions conduct business in a nation. According to Joaqui-Barandica et al., (2022), the key macroeconomic factors that have an impact on the profitability of commercial banks are shifts in economic activity and consumer price levels. This indicates how people's choices for using banking services are influenced by consumer costs and conditions.

Meanwhile, Mensi et al., (2020) revealed that exchange rate fluctuations affect the performance of commercial banks in a country. Exchange rate stability indicates the economy has a fairly good level of competitiveness and the domestic economy is in a stable situation amidst dynamic changes in the global economy (Ramlan & Adnan, 2016). In the context of changes in financial markets, exchange rate conditions indicate a country's economic prospects that are...
Integrated with the global economy (Shahmi & Aimon, 2020). This shows that an open economy determines the development of a country's economy and financial market, so exchange rate fluctuations require special attention.

The main macroeconomic policy, particularly monetary policy, is taken into consideration by the interaction of macroeconomic factors. According to Chen et al., (2022), monetary policy intervention provides a significant part in dictating how an economy's financial sector will expand. Loose monetary policy is required to boost economic activity in the banking sector when it is experiencing a slowdown. To boost banking performance, monetary authorities must pursue steadfast policies. In the meanwhile, conventional monetary policy must be paired with unconventional policy strategies when enacting short-term policies, claim Mamatzakis & Bermpe, (2016), to ensure that changes in the banking sector follow patterns that are more adaptable and resilient to macroeconomic shocks.

The relationship between micro and macro policies needs to be optimized, even though any changes caused by external causes demand special consideration. Management must optimize the way policies and plans are integrated to boost profitability. Jan et al., (2019) assert that management needs to keep a level of capital adequacy in order to attain the desired level of profitability. This strategy enables management of the organization to enhance banking operational performance, which subsequently has an effect on raising profitability. The capital adequacy ratio, meanwhile, is the cornerstone of management strategy and is crucial to boosting bank profitability (Beck et al., 2013). Banks are able to be more resilient to macroeconomic shocks and improper policy interventions thanks to an integrated policy approach.

The interaction of macroeconomic variables with the profitability of Islamic commercial banks requires special observations to analyze the extent to which macroeconomic variable shocks affect changes in the profitability of Islamic commercial banks in Indonesia. Then, monetary policy intervention, as the main policy in regulating the banking sector, must implement optimal policies to support increased banking performance. Therefore, further data are required to fully understand how monetary policy and macroeconomic variable shocks interact to affect the short- and long-term profitability of Indonesia's Islamic commercial banks.

**CONCEPTUAL FRAMEWORK**

**Profitability**

Profitability is the main indicator for measuring Islamic commercial banks' performance. Profitability shows the bank's ability to earn a profit for one period. According to Tho’in, (2019) banks' ability to make profits represents management's ability to optimize company operations. According to Nguyen et al., (2022) profitability is related to the bank's ability to adapt to macroeconomic policy shocks. When the banking industry experienced an aggressive competitive environment, any fluctuations that occurred in macroeconomic indicators affected banking operations. So, changes in macroeconomic policies affect the level of bank profitability.

**Real Effective Exchange Rate**

Real Effective Exchange Rate is a macroeconomic indicator that explains the strength of the exchange rate in the context of the prevailing price level. According to Mensi et al., (2020), real exchange rate fluctuations have an impact on conditions in the financial industry. The strengthening of the exchange rate shows positive sentiment on the market, thereby influencing the preferences of economic actors in making transactions on the financial market. On the other hand, the depreciation of the exchange rate raises concerns over an increase in crisis risk and has an impact on decreasing transactions in financial markets. The Real Effective Exchange rate shows how much the domestic
economy is connected to changes in the global economy. In this context, the real exchange rate indicator relates to the integration of domestic financial markets with international financial markets. So that any changes in banking operations directly affect the profitability of commercial banks.

**Consumer Price Index**

The Consumer Price Index is a measure of the average goods and services consumed by households. According to Hussain et al., (2023) The consumer price index is a measure of how the people's economy fully supports the development of a country. In addition, the consumer price index is a representation of people's purchasing power in an economy. Thus, every change that occurs in the price level determines the extent to which the public's ability to maintain and increase their consumption is affected.

Meanwhile, in relation to financial markets, the Consumer Price Index determines people's preferences when making decisions to save or invest. In the event that the price index increases too much, it will cause panic, which will impact people's decisions to withdraw their money stored in the banking system. On the other hand, a stable increase in the CPI shows good prospects for the economy, thereby increasing public interest in using banking products. This condition has a positive impact on bank profitability (Mensi et al., 2020).

**Monetary Policy Rate**

Monetary policy has an important role in maintaining the stability of the national economy. In the context of maintaining macroeconomic stability, monetary policy aims to maintain price stability by controlling the money supply. When the economy is experiencing a slowdown, the monetary authority loosens policies to increase the amount of money in circulation and increase economic activity. Conversely, monetary policy tightens when the economy experiences increased activity (Dang & Huynh, 2022).

Monetary policy is basically directly related to banking activities and operations. According to Dang (2020) Expansionary policy shocks had a positive impact on bank profitability. Expansionary policies technically affect the increase in the number of requests for financing. The stability of banking performance is determined by the consistency of financing distribution. According to Zuwardi et al.,(2019) The intensity of financing at banks is determined by a more expansive monetary policy, and increased financing is an early indication of the increasing profitability of Islamic commercial banks.

**Capital Adequacy Ratio**

The capital adequacy ratio is a measure that explains how much all of the bank's assets contain risk. Based on Bank Indonesia Regulation Number 3/21/PBI/2001, banks are required to provide a minimum capital of 8%, while the Indonesian Banking Architecture (API) requires a minimum of 12% to be declared healthy from risk-weighted assets stated in the Capital Adequacy Ratio (CAR). According to Yanikkaya et al.(2018) . Ideal capital adequacy implies the bank's ability to expand and innovate banking products, thus affecting the level of profit that will be obtained by the bank. Capital adequacy represents the strength of the bank internally to develop and survive, so maintaining capital adequacy is the main issue that must be the focus of management.

**RESEARCH METHOD**

**Type and Sources Of Data**

This study fully uses secondary data covering January 2015 to May 2022. Data is collected from FED (Fred Economic Data) and Sharia Banking Statistics, Financial Services Authority (OJK). The data set includes Return On Assets (ROA) as an indicator for measuring profitability,
Interaction of Macroeconomic Variable Shocks and Monetary Policy Interventions

Real Effective Exchange Rate (REER), Consumer Price Index (CPI) Monetary Policy Rate (MPR), Capital Adequacy Ratio (CAR)

<table>
<thead>
<tr>
<th>Variable</th>
<th>Abreviation</th>
<th>Description</th>
<th>Sources</th>
</tr>
</thead>
<tbody>
<tr>
<td>Profitability/Return On Assets</td>
<td>ROA</td>
<td>The profitability ratio measures the level of profit derived from total assets during a period by comparing net profit with average total assets.</td>
<td>OJK</td>
</tr>
<tr>
<td>Real Effective Exchange Rate</td>
<td>REER</td>
<td>Real Broad Effective Exchange Rate for Indonesia, Index 2010=100</td>
<td>FED</td>
</tr>
<tr>
<td>Consumer Price Index</td>
<td>CPI</td>
<td>Consumer Price Index is average goods and services consumed by households.</td>
<td>FED</td>
</tr>
<tr>
<td>Monetary Policy Rate</td>
<td>MPR</td>
<td>BI Rate as The prevailing policy instrument of the Indonesian Central Bank</td>
<td>FED</td>
</tr>
<tr>
<td>Capital Adequacy Ratio</td>
<td>CAR</td>
<td>Capital Adequacy Ratio of Islamic Commercial Banks in Indonesia</td>
<td>OJK</td>
</tr>
</tbody>
</table>

Model Specification

The analytical method used in this research was an econometric model with an ECM (error correction mechanism). A few of the steps for using the ECM test are as follows: the first is the data stationarity test using the Augmented Dickey Fuller test, which seeks to determine whether there has been no significant change in the data; the second is if all variables pass the unit root test, then the next cointegration test is to determine whether there may be a long-term relationship; and finally. The Engle Granger method is used in this study to test the cointegration of variables by using the ADF test statistic to determine whether the error term (u) model has a stationary base or not. The third test is the long-run relationship test, where the long-run equation in the ECM model is the basic equation, which is not stationary in level. The fourth test is the short-term relationship test, where the stationary error term (u), in the basic model, is also used as one of the variables in the short Similar variables from the long-term equation are also used in the short-term equation, but they are stationary in the same order.

This study uses four variables to analyze the interaction of macroeconomic variables and monetary policy interventions in influencing the profitability of Islamic commercial banks in Indonesia, namely:

\[ \text{ROA} = f(\text{REER}, \text{CPI}, \text{MPR}, \text{CAR}) \]  

(1)

Based on the function equation, ECM model can be derived as follows:

\[ \text{ROA}_t = \alpha_0 + \alpha_1 \text{REER}_t + \alpha_2 \text{CPI}_t + \alpha_3 \text{MPR}_t + \alpha_4 \text{CAR}_t + U_t \]  

(2)

Where \( t = \text{year} \); \( \alpha_0 = \text{constant} \); \( \alpha_1, \ldots = \text{coefficients} \); \( U = \text{error term} \).

The second is cointegration of the basic model:

\[ U_t = \text{ROA}_t - \alpha_0 - \alpha_1 \text{REER}_t - \alpha_2 \text{CPI}_t - \alpha_3 \text{MPR}_t - \alpha_4 \text{CAR}_t \]  

(3)

The third is the ECM model:

\[ \Delta \text{ROA}_t = \alpha_0 + \alpha_1 \text{REER}_t + \alpha_2 \text{MPR}_t + \alpha_3 \text{CPI}_t + \alpha_4 \text{CAR}_t + \Delta U_{t-1} + \epsilon_t \]  

(4)
RESULT AND DISCUSSION

Resut

The first step in the analysis is to assess the variables' stationarity using the Augmented Dickey-Fuller (ADF) test for the unit root test. The t-statistics and p-value for Table 2 indicate that ROA, REER, CPI, MPR, and CAR are stationary at first difference. Not all variables are stationary at the level, according to the unit root test in table 2, but they are all stationary at the first difference, allowing the ECM approach to continue to be used.

Tabel 2 : Unit root Test

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level</th>
<th>First Different</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-statistics</td>
<td>p-values</td>
<td>t-statistics</td>
</tr>
<tr>
<td>CAR</td>
<td>-2.192346</td>
<td>0.2106</td>
<td>-9.189207</td>
</tr>
<tr>
<td>REER</td>
<td>-2.190772</td>
<td>0.2112</td>
<td>-10.05359</td>
</tr>
<tr>
<td>CPI</td>
<td>-0.964200</td>
<td>0.7628</td>
<td>-7.259785</td>
</tr>
<tr>
<td>MPR</td>
<td>-1.373082</td>
<td>0.5919</td>
<td>-6.757090</td>
</tr>
<tr>
<td>CAR</td>
<td>-2.192346</td>
<td>0.2106</td>
<td>-9.189207</td>
</tr>
</tbody>
</table>

Sources: data processed with eviews 10

The second analysis uses the ADF test statistic to do the Engle Granger method cointegration test to determine whether or not the error term in the basic model is stationary because the ECM model might be used in this study. Table 3 displays the outcomes. The estimations for Indonesia based on Table 3 show that the study's variables have cointegration since the error term value of the core model is stable, indicating that the variables under consideration have a long-term relationship.

Tabel 3: Cointegration test statistics of error term from the basic model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Level</th>
<th>First Different</th>
<th>Decision</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>t-statistics</td>
<td>p-values</td>
<td>t-statistics</td>
</tr>
<tr>
<td>Ut</td>
<td>-3.447271</td>
<td>0.0118</td>
<td>-</td>
</tr>
</tbody>
</table>

Sources: data processed with eviews 10

The third analysis is continued with the long-term test, described in Table 4 with coefficients, statistics, and probs, because the variables show cointegration and a long-term association. Due to the cointegration of the variables, profitability, macroeconomic factors, and monetary policy have a long-term link. Indonesia believes that REER, CPI, and CAR have significant effects on profitability. While the MPR does not have a significant influence on the profitability of Islamic commercial banks in Indonesia in the long term.

Table 4: Long run relationships from basic model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-statistics</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>-14.93086</td>
<td>-2.042846</td>
<td>0.0442</td>
</tr>
<tr>
<td>REER</td>
<td>-0.200421</td>
<td>-4.104105</td>
<td>0.0001</td>
</tr>
<tr>
<td>CPI</td>
<td>0.389622</td>
<td>11.83036</td>
<td>0.0000</td>
</tr>
<tr>
<td>MPR</td>
<td>0.051094</td>
<td>0.302733</td>
<td>0.7628</td>
</tr>
<tr>
<td>CAR</td>
<td>-0.929764</td>
<td>-24.67919</td>
<td>0.0000</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.943216</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: data processed with eviews 10
The ECM model may be employed in this study; thus, for the fourth analysis, a short-run test is conducted with the same ordering of each variable. The results are given in Table 5, along with the coefficients, statistics, and probs. Based on Table 5, a large 1% mistake is seen in Islamic commercial banks in Indonesia. This error is shown as the one-period lagged value of the short-term equation term error. This circumstance denotes a momentary issue brought on by trivial factors. According to Indonesia's Islamic Commercial Banks, REER, CPI, and MPR have an impact on shocks to profitability.

Table 4: Long run relationships from basic model

<table>
<thead>
<tr>
<th>Variables</th>
<th>Coefficient</th>
<th>t-statistics</th>
<th>Prob</th>
</tr>
</thead>
<tbody>
<tr>
<td>C</td>
<td>0.149438</td>
<td>1.657122</td>
<td>0.1013</td>
</tr>
<tr>
<td>D(REER)</td>
<td>-0.001658</td>
<td>-0.039997</td>
<td>0.9682</td>
</tr>
<tr>
<td>D(CPI)</td>
<td>-0.134377</td>
<td>-0.750195</td>
<td>0.4553</td>
</tr>
<tr>
<td>D(MPR)</td>
<td>0.632134</td>
<td>1.837540</td>
<td>0.0698</td>
</tr>
<tr>
<td>D(CAR)</td>
<td>-0.844573</td>
<td>-21.33759</td>
<td>0.0000</td>
</tr>
<tr>
<td>ECT (-1)</td>
<td>-0.929764</td>
<td>-3.112497</td>
<td>0.0026</td>
</tr>
<tr>
<td>R-Squared</td>
<td>0.853064</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Sources: data processed with eviews 10

Discussion

The profitability of Islamic commercial banks is influenced by macroeconomic variables and monetary policy interventions in the long and short term. The findings in this study indicate that, in the long term, real exchange rate conditions have a significant effect on the profitability of Islamic commercial banks in Indonesia. These results confirm previous studies that show the magnitude of the influence of exchange rate fluctuations on the performance of banking and financial markets in a country (Azad et al., 2023; Jan et al., 2019). Meanwhile, in the short term, fluctuations in the real exchange rate will disrupt profitability. This indicates that changes in exchange rates have a high probability of disrupting banking performance, so special treatment is required as an adjustment to disturbances caused by fluctuations in exchange rates in the short term.

The profitability of Islamic commercial banks is greatly impacted by changes in consumer pricing levels. The results of this study support those of earlier studies that explain how consumer desires for increased access to and use of banking products are influenced by stable price levels. As a result, over time, price stability has an impact on how profitable Islamic commercial banks are (İncekara & Çetinkaya, 2019; Trad et al., 2017; Yuliana & Bashir, 2017). However, in the short term, the condition of the consumer price index does not have a significant effect on changes in the profitability of Islamic commercial banks. According to Trad et al.,(2017) Changes in consumer price levels have implications for several preferences held by consumers. In the short term, consumers are more likely to concentrate on short-term needs and not prioritize financial decisions. So this has an impact on decisions about using financial and banking products.

Meanwhile, monetary policy intervention does not have a significant effect on the profitability of Islamic commercial banks in the short and long term. These findings indicate that conventional monetary policy is not effective in influencing banking sector conditions (Wang, 2023). According to Jan et al. (2019) monetary policy intervention in Islamic banking does not have high effectiveness because the characteristics of Islamic banking do not follow the conventional monetary policy transmission mechanism. However, the limitations of this research include not being able to explain explicitly how the influence of monetary policy intervention through policy instruments that are directly related to Islamic banking is affected, so further research is needed.
In this study, the internal condition of the banking system effectively influences changes in profitability in the short and long term. The capital adequacy ratio shows a significant and consistent effect over time. In accordance with research conducted by Trinugroho et al., (2018); Yuliana & Bashir (2017), the bank's ability to maintain capital adequacy significantly affects profitability conditions. In addition, there is cointegration in the long run between the independent variables, so it can be understood that changes in macroeconomic conditions have an interaction with corporate management governance. This shows that management's policy response to macroeconomic policies is quite fast and persistent.

CONCLUSION

The profitability of Islamic commercial banks is the main indicator for measuring banking performance. Changes in banking performance are closely related to macroeconomic variables and monetary policy interventions. Any changes that occur in the macroeconomic environment will have an impact on people's behavior in using banking products, which will have a significant impact on the profitability of Islamic commercial banks. The results of the study show that changes in the real effective exchange rate and the consumer price index have a significant effect on the profitability of Islamic Commercial Banks in Indonesia in the long term. Meanwhile, monetary policy intervention did not significantly affect the profitability of Islamic Commercial Banks in Indonesia in the short and long term. Meanwhile, changes in macroeconomic conditions cause shocks to the profitability of Islamic commercial banks in Indonesia. This condition indicates that macroeconomic problems have the possibility of disrupting banking performance in the short term, and this condition indicates that banking management has not implemented a flexible policy and strategic approach to short-term changes. However, management is quite effective in terms of managing capital adequacy, so changes in the short term are still handled from the perspective of handling internal conditions.

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