



Islamic monetary instruments and msme financing in Indonesia: Empirical evidence for inclusive and sustainable growth

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ABSTRACT

Background: Bank Indonesia as the monetary authority uses Islamic monetary instruments to promote inclusive financial access and real sector, especially Micro, Small, and Medium Enterprises (MSMEs) that are a significant part of the national economic resilience. **Methods:** This study uses monthly time-series data between January 2012 to December 2024 obtained through Bank Indonesia and Financial Services Authority (OJK) and implements the Vector Error Correction Model (VECM), and the Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) analysis. **Findings:** The IRF results indicate that PUAS and FASBIS have a stable and positive effect in MSME financing over time, SBIS has a small effect. In the meantime, the FEVD analysis proves that Islamic monetary instruments are significant determinants of changes in the financing of MSMEs. Such findings indicate the strategic effectiveness of the Islamic monetary policy towards inclusive and sustainable growth, particularly in the environment of digital transformation and economic uncertainty in the world. **Conclusion:** This paper concludes that out of the three Islamic monetary instruments studied; SBIS, PUAS, and FASBIS, only PUAS and FASBIS have a significant long-term impact on MSME financing in Indonesia with SBIS having no significant effect in the short or long run. **Novelty/Originality of this article:** The proposed study is expected to determine the efficacy of the Sharia-based instruments, SBIS, PUAS, and FASBIS in relaying the monetary policy through the MSME financing channel.

KEYWORDS: financial inclusion; Islamic monetary instruments; MSME financing; VECM.

1. Introduction

Indonesia is a country where Micro, Small, and Medium Enterprises (MSMEs) are regarded as one of the pillars of the national economic development. MSMEs contribute to the reduction of income inequality, addressing regional differences, and alleviating poverty, with more than 64.2 million business units producing over 61.07 percent of the national GDP and employing 97 percent of the total workforce (Bappenas, 2021). However, their significance is not necessarily captured in their financial stability because most MSMEs face difficulties in securing sufficient and sustainable sources of funding, particularly in times of economic insecurity (Prakash & Verma, 2019; Prasetyo, 2020; Tambunan, 2017).

The COVID-19 pandemic also revealed the structural weakness of MSMEs, and it has led to a significant number of them going under because of liquidity problems and market

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shocks (Harahap & Tambunan, 2022). This crisis highlighted the necessity of more inclusive and responsive financial system which will be able to not only help to achieve the liquidity but also stability and equitable growth in crisis. The Islamic finance, which has ethical basis and is real-sector oriented, is becoming an attractive alternative (Juhro, 2020b).

The Islamic monetary instruments, including Sertifikat Bank Indonesia Syariah (SBIS), Pasar Uang Antar Bank Syariah (PUAS), and Fasilitas Simpanan Bank Indonesia Syariah (FASBIS) are liquidity tools applied by Bank Indonesia to facilitate macroeconomic stability in line with Sharia principles. In contrast to conventional instruments, these tools are based on non-riba mechanisms and focus on risk-sharing, fairness, and the elimination of the speculative attitude (Ascarya, 2012; Sejati, 2018). It is assumed that they will not only stabilize monetary conditions but also contribute to the productive activities like MSME financing.

Some studies have proposed that Islamic monetary instruments can be more effective in accessing real sectors and micro-enterprises due to their alignment with ethical and inclusively development-oriented goals (Septindo et al., 2016; Wahyuni, 2022). They are designed in accordance with social objectives and Sustainable Development Goals (SDGs) particularly with respect to encouraging decent work and economic growth (SDG 8) and minimizing inequalities (SDG 10). However, the current empirical literature is still scarce and isolated, especially within the framework of recent economic shocks globally as well as digitalization.

The transmission of the monetary policy is further complicated by the digital economy. As digitalization increases the velocity and scope of financial services, it also necessitates responsive monetary tools that are capable of being incorporated into the contemporary financial infrastructure (Mulyadi et al., 2022). The Islamic instruments like SBIS, PUAS and FASBIS should not only transform into the liquidity providers but also participate in the facilitation of fintech-based MSME financing. The transformation of the Islamic monetary policy in a digital format is essential to ensuring that these tools become useful in the era of real-time data, mobile banking, and decentralized finance systems.

In order to overcome these issues and bridge the empirical gap, the purpose of the present paper is to investigate the usefulness of Islamic monetary instruments (namely SBIS, PUAS, and FASBIS) in the context of MSME financing in Indonesia. In this research, the time-series data of the period January 2012 to December 2024 are utilized with the help of econometric models such as the Vector Error Correction Model (VECM), Impulse Response Function (IRF), and Forecast Error Variance Decomposition (FEVD). These methods enable the examination of the study to determine both the short-term shocks and long-term equilibrium among Islamic monetary instruments and MSME financing.

The purpose of the study is to understand how Islamic monetary instruments, SBIS, PUAS, and FASBIS, can be effective in affecting the distribution of financing to the MSME sector in Indonesia. The study particularly examines the short run and long run effects of these instruments by use of the Vector Error Correction Model (VECM), and in addition to this the study examines the dynamic effects of MSME financing to monetary shocks by use of the Impulse Response Function (IRF). Moreover, the paper also estimates how each Islamic instrument contributes to the fluctuations in MSME financing through the means of the Forecast Error Variance Decomposition (FEVD) method. Finally, the paper aims at presenting empirical knowledge in order to help justify the strategic role of Islamic monetary policy towards attaining inclusive, sustainable and resilient economic growth especially within the context of the Sustainable Development Goals (SDGs).

Theoretically, Islamic monetary instruments are not only developed as a liquidity management instrument but also as a vehicle to enhance inclusive economic growth, especially by channelling funds to the real sector like MSMEs. These tools are based on Sharia that focuses on risk-sharing, asset-backing in real form and bans interest (riba), unlike standard monetary instruments (Juhro, 2020a). Such instruments as the SBIS, PUAS, and FASBIS are designed to promote financial stability and at the same time facilitate productive financing operations (Ascarya, 2012; Sejati, 2018).

In this regard, the empirical literature has shown that Islamic monetary instruments have a more stable and influential effect on the financing of MSMEs than their conventional counterparts. Sejati (2018) found that SBIS and profit-and-loss sharing (PLS) mechanisms significantly affect MSME financing through Islamic banking channels especially in long run. In the same way, Wahyuni (2022) also determined that Islamic monetary instruments, SBIS and PUAS, are more effective than SBI and PUAB in helping MSME sectors, particularly in the context of economic uncertainties. Such results correspond to the hypothesis that Islamic monetary transmission, based on non-interest and ethical financing principles, is more appropriate to the development of inclusive finance.

MSMEs are recognized as critical contributors to national economic resilience. According to the Ministry of Cooperatives and SMEs (2021), MSMEs contribute more than 61% of Indonesia's GDP. Despite their strategic role, MSMEs continue to face persistent challenges in accessing adequate financing, especially under economic pressures and uncertain global conditions (Tambunan & Nawawi, 2018). Financial inclusion for MSMEs is thus seen as a foundational component for sustainable and inclusive economic development (Beck, 2008). In Bank Indonesia's Islamic monetary activities, Islamic monetary instruments including FASBIS, PUAS, and SBIS are essential tools. These instruments, in contrast to traditional ones, have to adhere to Sharia law, which forbids interest (*riba*) and promotes risk-sharing arrangements.

Islamic banks use SBIS, which is designed as a short-term Sharia-compliant investment certificate, to absorb surplus liquidity (Ben et al., 2015). According to Djelassi (2020), PUAS serves as an interbank money market platform that promotes liquidity efficiency by facilitating short-term liquidity transactions between Islamic financial institutions. Bank Indonesia offers a liquidity facility called FASBIS, which helps Islamic banks manage their daily liquidity needs by acting as a safety net in times of temporary crisis (Khan & Mirakhor, 1994). According to recent empirical research, Islamic monetary policy tools—specifically, PUAS and FASBIS—have a beneficial impact on the amount of MSME financing and serve as efficient channels for the dissemination of policy, as demonstrated by Ponziani (2020). However, because of its limited direct engagement with MSME channels, SBIS has had very muted effects on financing in the real sector, despite being effective in controlling liquidity (Furqani & Mulyany, 2009).

Furthermore, the studies by Ramadhan & Beik (2013) and Muhfiatun et al. (2021) emphasize that Islamic banking financing of MSMEs is less subject to monetary shock, and SBIS contributes to MSME financing to a larger extent in the long-term perspective compared to SBI. The Islamic monetary policy transmission through PUAS and FASBIS also contributes to the significant role of enforcing the circulation of liquidity in the Islamic banking system, which indirectly contributes to the intermediation of MSME (Madani & Widiastuti, 2021; Marpaung & Tambunan, 2024). Nevertheless, although the potential of these tools is obvious, additional research is needed to find out the scale and dynamics of their impact, especially in the post-pandemic recovery period with the digitalization of the economy and geopolitical instability.

2. Methods

The data used is secondary data in the form of monthly time series data of the period January 2012 to December 2024. The secondary data is published data that has not been processed by organizations (Siregar, 2020). The researcher uses sources of data in the form of external data sources which are secondary data that are collected by sources outside the organization (Muhammad, 2012). The sources of data are Indonesian Banking and Economic Statistics (SEKI) collected by Bank Indonesia and Islamic Banking Statistics (SPS) by the Financial Services Researcherity (OJK). The secondary data employed in this research is time series data that covers a period of 13 years which is 13 months beginning January 2012 to December 2024.

The method of research in this research is quantitative method. This research employs the secondary data (Sugiyono, 2015a). Furthermore, this data is a time series which is

collected on the site of Bank Indonesia (BI) and the Financial Services Researcherity (OJK). The data that will be analyzed are SBIS, PUAS, FASBIS and Financing 2012-2024. The particular type of analysis is Vector Error Correction Model (VECM) approach. The models to be used are:

$$\text{FINANCING}_t = f(\text{SBIS}_t, \text{PUAS}_t, \text{FASBIS}_t) \quad (\text{Eq. 1})$$

Based on Equation 1, the variables used in this study are defined as follows. FINANCING_t represents Islamic financing provided to Micro, Small, and Medium Enterprises (MSMEs) and serves as the dependent variable in the analysis. Meanwhile, SBIS_t denotes the Bank Indonesia Islamic Certificate (*Sertifikat Bank Indonesia Syariah*), PUAS_t represents the Islamic Interbank Money Market (*Pasar Uang Antarbank Syariah*), and FASBIS_t refers to the Islamic Deposit Facility (*Fasilitas Simpanan Bank Indonesia Syariah*). These variables are employed as independent variables to examine the influence of Islamic monetary instruments on the financing of Islamic MSMEs over time. The model equation of the VAR in the form of matrix used in the research is:

$$\begin{bmatrix} \text{FINANCING}_t \\ \text{SBIS}_t \\ \text{PUAS}_t \\ \text{FASBIS}_t \end{bmatrix} = \begin{bmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \\ \beta_{40} \end{bmatrix} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} & \beta_{14} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} \\ \beta_{31} & \beta_{32} & \beta_{33} & \beta_{34} \\ \beta_{41} & \beta_{42} & \beta_{43} & \beta_{44} \end{bmatrix} + \begin{bmatrix} \text{FINANCING}_{t-1} \\ \text{SBIS}_{t-1} \\ \text{PUAS}_{t-1} \\ \text{FASBIS}_{t-1} \end{bmatrix} + \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix} \quad (\text{Eq. 2})$$

There is cointegration in the model at the time of data processing, it can be combined with model VECM. The equations of the model VECM in this research are as follows:

$$\begin{bmatrix} \Delta \text{FINANCING}_t \\ \Delta \text{SBIS}_t \\ \Delta \text{PUAS}_t \\ \Delta \text{FASBIS}_t \end{bmatrix} = \begin{bmatrix} \beta_{10} \\ \beta_{20} \\ \beta_{30} \\ \beta_{40} \end{bmatrix} + \begin{bmatrix} \beta_{11} & \beta_{12} & \beta_{13} & \beta_{14} \\ \beta_{21} & \beta_{22} & \beta_{23} & \beta_{24} \\ \beta_{31} & \beta_{32} & \beta_{33} & \beta_{34} \\ \beta_{41} & \beta_{42} & \beta_{43} & \beta_{44} \end{bmatrix} + \begin{bmatrix} \text{FINANCING}_{t-1} \\ \text{SBIS}_{t-1} \\ \text{PUAS}_{t-1} \\ \text{FASBIS}_{t-1} \end{bmatrix} - \lambda \begin{bmatrix} \mu_{1t} \\ \mu_{2t} \\ \mu_{3t} \\ \mu_{4t} \end{bmatrix} \quad (\text{Eq. 3})$$

The notation used in the model is described as follows. Δ (Delta) represents the change in each variable over a given period, indicating the first difference of the variable in the model. Meanwhile, λ (Lambda) denotes the adjustment coefficient from the short run to the long run, which measures the speed at which deviations from the long-run equilibrium are corrected over time. A significant and negative value of λ indicates that the system gradually adjusts toward its long-run equilibrium following a short-term shock.

The Vector Auto Regression (VAR) analysis of VECM is a non-stationary analysis with a cointegration relationship (Saputra & Sukmawati, 2021). VECM enables the effective estimation of parameters even in cases when the variables are correlated and considers the long-term and short-term relationships simultaneously (Civciristov et al., 2018).

3. Results and Discussion

3.1 Stationarity test

The stationarity test was performed to observe whether the data was stationary to avoid Lancing regression or spurious regression. Therefore, in case all the variables are stationary then the coefficients in the model will be valid. In this analysis the Augmented Dickey- Fuller (ADF) method is used to identify stationary data. From the Table 1, shows the unit root test or stationary test is carried out at the level and First Difference level. In the four variables above, it can be concluded that all stationary variables at the First Difference level are SBIS, PUAS, FASBIS and Financing variables. This can be seen in the ADF probability value of all variables showing less than $= 0.05$, then all variables do not occur unit root at the First Difference level.

Table 1. Stationarity data

Variable	Level			First Difference		
	Prob. ADF	ADF t-statistics	p-Value	Prob. ADF	ADF t-statistics	p-Value
Financing	0.8586	-0.633071	-2.880088	0.0000	-12.07726	-2.880211
Sbis	0.5938	-1.373839	-2.880336	0.0001	-4.796110	-2.880336
Puas	0.3448	-1.871949	-2.880336	0.0000	-13.39663	-2.880336
Fasbis	0.3083	-1.951022	-2.880211	0.0000	-6.517992	-2.880211

3.2 Optimal lag test

The Optimum lag is determined to demonstrate the length to which a reaction of a variable is to another variable and also to eradicate the issue of autocorrelation in VAR/VECM. The minimum value of the Akaike Information Criterion (AIC) and Schwarz Criterion (SC) criteria are used to select optimum lag (Sugiyono, 2015b). The lag test is determined based on the smallest Akaike Information Criterion (AIC) and Schwarz Criterion (SC) criteria. According to the optimal lag test results, this analysis determined as the 2nd lag.

Table 2. Lag optimum

lag	LogL	LR	FPE	AIC	SC	HQ
0	-1722.642	NA	187254.7	23.49173	23.57310	23.52479
1	-1664.674	111.9935	105802.5	22.92073	23.32759*	23.08605*
2	-1645.270	36.43151	101065.9*	22.87442*	23.60677	23.17199
3	-1639.428	10.65178	116187.9	23.01262	24.07046	23.44243
4	-1628.229	19.80739	124317.2	23.00794	24.46127	23.64000
5	-1616.093	20.80404	131515.6	23.13052	24.83934	23.82483
6	-1609.353	11.18809	149992.5	23.25650	25.29081	24.08306
7	-1592.878	26.44939*	150166.0	23.25004	25.60984	24.20885
8	-1588.634	6.582091	178010.0	23.40999	26.09527	24.50105

3.3 VAR stability test

The VAR stability should be determined prior to the continuation of the analysis. It is reported that the VAR model is stable when the modulus of its roots is less than 1 (Saputra & Sukmawati, 2021). The VAR stability test is considered as stable when the roots are with modulus less than 1 (Saputra & Sukmawati, 2021). The stability of the VAR system is viewed by using the VAR stability test. When the modulus of all roots is less than one in absolute value and within the unit circle, then the VAR model is stable hence the ensuing IRF and FEVD analysis is regarded valid. Based on the outcomes of the VAR stability test, one can conclude that the VAR system is stable since the roots of the test are within a rage that is less than one that is approximately 0.091935-0.749685.

Table 3. Stability VAR model

Root	Modulus
0.750732	0.749685
-0.251897 - 0.553342i	0.607980
-0.251897 + 0.553342i	0.607980
0.568289	0.568289
-0.389906	0.389906
0.126394	0.126394
-0.0528665 - 0.075215i	0.091935
-0.0528665 - 0.075215i	0.091935

3.4 Cointegration test

Cointegration test is applied in order to check whether the long-term correlation exists between variables that are stationary in the same degree. In case the value of probability is below 0.05, it is a sign of cointegration, which implies the existence of long-term equilibrium (Gio, 2019). This cointegration test is conducted using the framework of VAR model by the incorporation of error correction component to demonstrate the occurrence of cointegration also known as Vector Error Correction. The cointegration test was done using the Johansen Cointegration test with Optimum lag of 2 as determined earlier. The test results above show that there are three cointegration relationship, this is because the critical value is greater than the statistical trace value. So far the next test, the long-term test can be continued, namely the VECM test.

Table 4. Cointegration test

Hypothesized No. of CE(s)	Trace Statistics	0.05 Critical Value	Prob.**	Conclusion
None *	162.6478	47.85613	0.0000	Cointegrated
At most 1 *	76.82905	29.79707	0.0000	Cointegrated
At most 2 *	33.64440	15.49471	0.0000	Cointegrated
At most 3 *	15.29200	3.841465	0.0001	Cointegrated

3.5 VECM Estimate

The paper uses Vector Error Correction Model (VECM) to examine the effect of three Islamic financial instruments such as SBIS, PUAS and FASBIS on financing of Micro, Small and Medium Enterprises (MSMEs) in Indonesia. The findings of the estimation are categorized into the short and the long-term effects. The t-statistics are compared with a critical t-table value of 1.976 at the 5 percent level of significance to establish the significance of the respective coefficients. A value of t-statistic that is greater than the value would conclude that the variable has a significant effect.

Table 5. VECM Estimate

VECM Estimation Results			
Short-term			
Variable	Coefficient	T-statistic value	Information
SBIS	28825.7	0.15861	Not significant
PUAS	3647.34	0.14208	Not significant
FASBIS	19769.3	-0.13090	Not significant
Long-term			
SBIS	179858.	0.79636	Not significant
PUAS	50679.8	-10.4890	Significant
FASBIS	140559.	4.85254	Significant

The result of the estimation in the short run indicates that all the three Islamic monetary instruments, namely SBIS ($t = 0.15861$), PUAS ($t = 0.14208$) and FASBIS ($t = -0.13090$) are non-statistically significant. Although they have large t-statistic values, the model output considers them as insignificant, and this can be as a result of either variable scaling or multicollinearity problems. These results suggest that the transfer of Islamic monetary policy does not have an immediate impact on financing of the MSMEs. This aligns with the results of Ascarya, (2012), Bayuni & Acarya (2010); Wibowo & Mubarok (2018) and Muhfiatun et al., (2021), who observed that the Islamic monetary transmission mechanisms, which are based on the real-sector relationships rather than the interest rate changes, are more effective in the long run.

PUAS and FASBIS have significant effects on the MSME financing in the long run and SBIS is not significant. The t-statistic value of the coefficient of SBIS (179858.) is 0.79636, which implies that there is no significant long-run impact on the financing of MSMEs, implying that SBIS does not have much to offer in strengthening real sector activity. This

finding is consistent with the study of Muhfiatun et al., (2021) which analyzed the performance of SBIS, SBSN, and PUAS based on VECM and the authors found that these instruments were not particularly effective in promoting MSME financing substantially. The small effect of SBIS can be attributed to the fact that it is not an expansionary monetary tool but a liquidity absorption tool. As Ascarya, (2012), Wibowo & Mubarak (2018) mention, SBIS does not include direct ways of stimulating the growth of credit as it was created to stabilize the excess liquidity rather than directly address the financing needs of MSMEs.

PUAS has the coefficient of 50679.8 and t-statistic of -10.4890, which exhibits a strong negative impact on MSME financing in the long term. This finding implies that overreliance on the interbank liquidity transactions, even in the Sharia-compliant system, may create inefficiencies and undermine the transmission of monetary policy to the real sector. This may also be attributed to structural weaknesses like limited availability of counter parties, low levels of transactions, and absence of standardization in the Islamic interbank money markets. Such a discovery contradicts the positive attitude towards PUAS expressed by Johari et al. (2022) and Putra et al. (2023) who stated that with proper infrastructure and regulation support, PUAS could be used to promote inclusive growth.

FASBIS has a positive and important long-term impact and its coefficient is 140559. and t-statistic is 4.85254. This implies that the provision of liquidity via FASBIS boosts the ability of the Islamic banks to provide financing to MSMEs. FASBIS enables banks to address the short-term liquidity requirements without using interest-based mechanisms, therefore, making the monetary instruments compatible with the Islamic concepts. The long-run success of FASBIS confirms the earlier findings by Harahap & Tambunan (2022), Herianingrum & Syapriatama (2016) and Winarto & Beik (2024), which emphasized the significance of the Sharia-based liquidity facilities in stability of the financial system and its role in the development of the real sector.

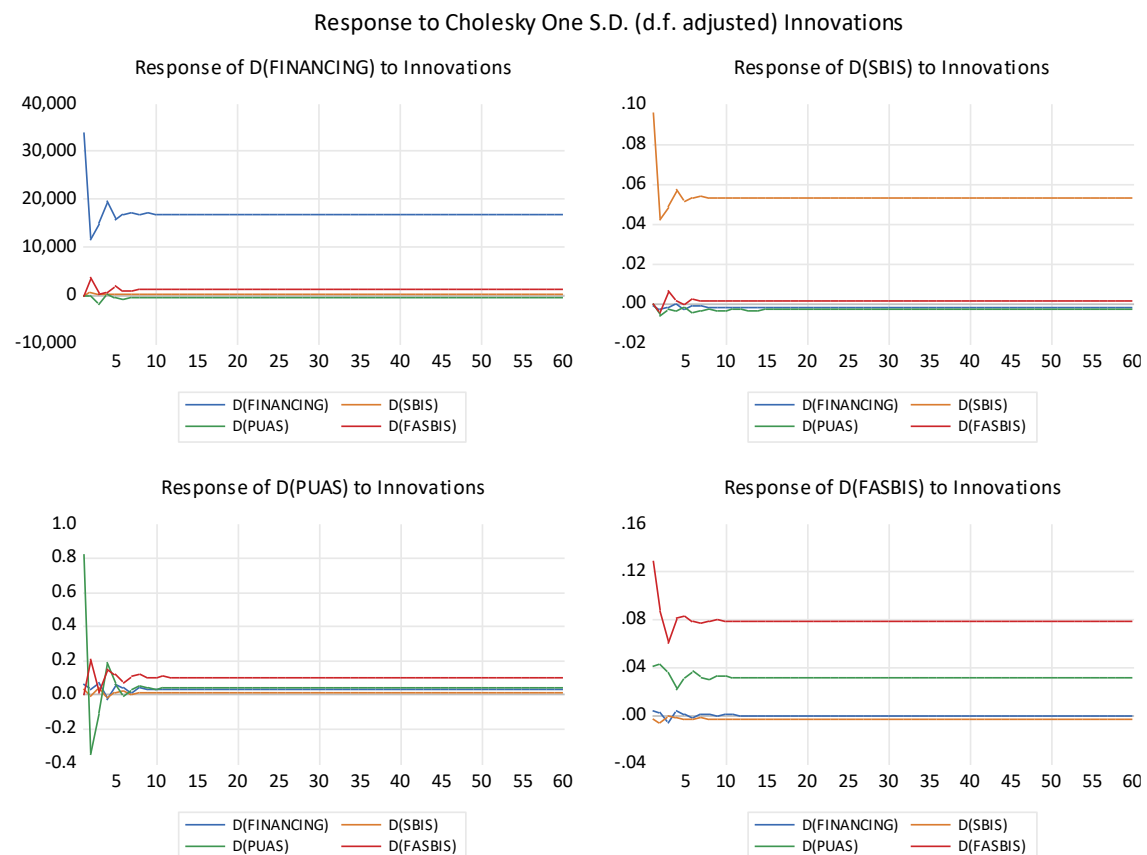
In conclusion, the VECM findings indicate that Islamic monetary instruments do not have much effect on the short run but have more significant effect in the long run- especially the PUAS and FASBIS. The fact that SBIS plays an insignificant role, both in the short-term and in the long-term, indicates that it should be restructured and revitalized in its design and use. In the meantime, the adverse impact of PUAS is to be resolved by enhancing regulation, interbank market development, and infrastructure. On the other hand, the significant positive impact of FASBIS proves its position as an efficient liquidity instrument that complies with the Sharia provisions and promotes inclusive development by means of MSMEs development. In the future, the priority in policies must be to maximize the effectiveness of the functioning of these tools and to improve their transmission to the real sector.

3.6 IRF (Impulse Response Function)

The estimation of impulse response functions is carried out to determine how other variables react to shocks of the innovation variable. This is an estimation in which it is assumed that the innovation variables are not related and hence the influence of a shock can be traced directly. The graph of the impulse response will indicate the response of a variable to the shocks of other variables after a number of periods following the shock (Gio, 2019).

The analysis of the Impulse Response Function (IRF) demonstrates the dynamic of the impact of Islamic monetary instruments - SBIS, PUAS, and FASBIS - on MSME financing in Indonesia, which can be regarded as an important lesson in the general context of digital transformation, sustainable growth and resilience in the face of geopolitical uncertainty. The results indicate that MSME financing is most responsive in short term to PUAS (Pasar Uang Antarbank Syariah). This shows that it is relevant as a Sharia-compliant liquidity provider that, combined with digital platforms and standard contracts, can be used to speed up the process of raising funds by MSMEs, particularly during the time of global economic tension (Muhfiatun et al., 2021). This justifies the SDGs in the areas of inclusive economic

growth (Goal 8) and industry innovation (Goal 9) and the transformation capacity of Islamic financial infrastructure in the sustainability and financial inclusion (Johari et al., 2022).



Conversely, the SBIS (*Sertifikat Bank Indonesia Syariah*) has low response both in the short run and long run indicating its passive nature as a liquidity-absorbing instrument as opposed to an expansionary monetary instrument. The fact that it does not have a significant impact on the financing of MSMEs highlights the issue of making sure that traditional Islamic monetary instruments can be adjusted to the evolving financial environment dictated by digitalization. In a time when fintech innovations are transforming the financial flows, such instruments as SBIS might need to be reengineered to be more sensitive to the requirements of the real sector and correspond to SDGs regarding inequalities reduction (Goal 10) and resilient infrastructure development (Goal 9) (Ascarya, 2012; Wibowo & Mubarak, 2018).

On the contrary, FASBIS shows a positive and not significant long-term impact on MSME financing and indicates its strategic position as a liquidity provider that complies with Sharia. Its long-term effects are in line with the notion that Islamic liquidity instruments well-developed can contribute to the sustainable recovery and resilience against macroeconomic shocks and geopolitical imbalances. This is related to SDG Goal 8 (decent work and economic growth) and Goal 17 (strengthening implementation partnerships), where the Islamic financial instruments such as FASBIS can be considered as the tools that enable the development of the real sector on the basis of ethical and risk-sharing principles (Madani & Widiastuti, 2021; Winarto & Beik, 2024).

Further, the varying reactions of each instrument indicate that Islamic financial systems must be dynamic and responsive to the global uncertainties. The passive presence of SBIS, the fluctuation of PUAS, and the consistent input of FASBIS all indicate that Islamic monetary activities need to be redesigned with digital support systems, the merger of financial markets, and more robust regulatory systems. Such reforms would help Islamic finance to serve MSMEs better, who are usually the most affected when there is a

geopolitical tension, making Islamic economics a source of balanced growth and financial stability (Karim, 2007; Rosly, 2005; Sejati, 2018).

Overall, the results of the IRF highlight the vital role of Islamic financial instruments, namely, PUAS and FASBIS, in the process of SDGs attainment based on the development of MSMEs. A reinforcement of these tools, both physically and virtually, will boost the contribution of Islamic finance to the provision of sustainable and inclusive growth in the face of economic disparity in the world. The policy recommendations of the future must be aimed at the digitalization of the Islamic money market, its transparency, and improved access to ethical financing to make sure that MSMEs will survive under the changing geopolitical and economic conditions (Putra et al., 2023).

3.6 FEVD (forecast error variance decomposition)

Variance decomposition is the decomposition of the variation of a particular endogenous variable into the variations of shocks in other endogenous variables in the VAR system. The decomposition shows the share of the movement of a series due to shocks of the variable itself relative to shocks of other variables.

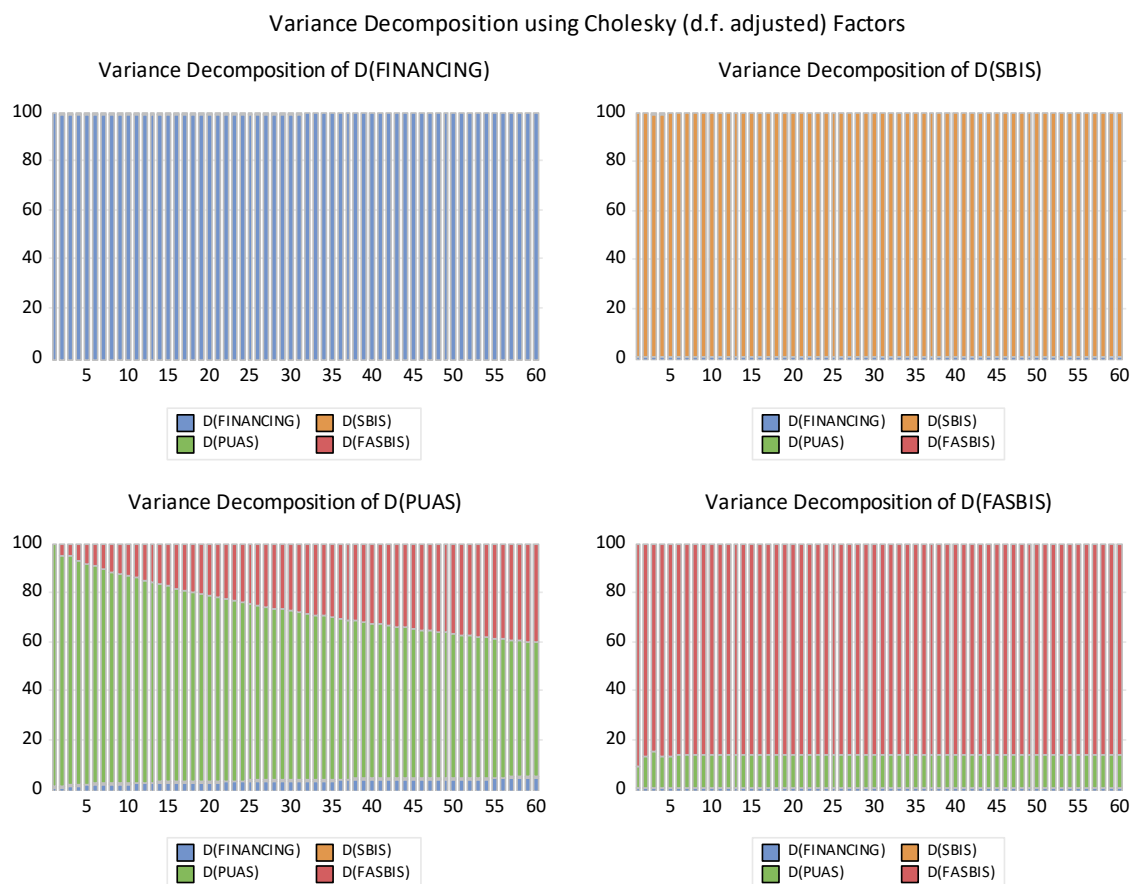


Fig. 2 FEVD Test (Conventional Model)

The FEVD (Forecast Error Variance Decomposition) analysis is used to give a quantitative assessment of how much the variations in MSME financing and Islamic monetary instruments (SBIS, PUAS, FASBIS) can be attributed to shocks to each variable in the system. The findings indicate the comparative significance of all the variables in the process of transmission of Islamic monetary policy onto MSME financing in Indonesia.

Based on the upper left graph, it can be seen that the variation in the MSME financing (D(FINANCING)) is largely dominated by the innovations in MSME financing itself, with an almost 100 percent contribution over the 60-period horizon. This shows that the level of persistence and exogeneity of the MSME financing movements is high, and short-term

shocks to Islamic monetary instruments have no significant impact on the variance of financing. This observation is consistent with the findings of Ascarya (2012) and Wibowo & Mubarak (2018) that the Islamic monetary instruments demand a more robust and long-term transmission policy mechanism to affect the real part.

The decomposition of the variance of SBIS ($D(SBIS)$) in the upper right graph also indicates almost complete explanation by its own shocks. This highlights the fact that SBIS is a passive liquidity-absorbing tool, and the degree of interactive effect by the other variables in the system is minimal. It has a low spillover impact on MSME financing, a low utility of assisting inclusive economic objectives unless restructured to undertake more proactive roles (Madani & Widiastuti, 2021; Muhfiatun et al., 2021).

Almost total explanation by its own shocks is also indicated by the decomposition of the variance of SBIS ($D(SBIS)$) in the upper right graph. This emphasizes that SBIS is a passive liquidity-absorbing instrument, and the extent of interactive effect of the other variables within the system is insignificant. It has a low spillover effect on the MSME financing, low utility in supporting inclusive economic goals unless it is restructured to perform more active roles (Madani & Widiastuti, 2021; Masyitha, 2013; Rosly, 2005).

The bottom right graph demonstrates the variance decomposition of FASBIS ($D(FASBIS)$) with a consistent and significant share of it, over 80%, being explainable by its own shocks, and PUAS explaining about 10-15 percent in the long term. This helps FASBIS to play a more independent and stable liquidity asset that can sustain long-term funding stability of the Islamic banks. The interdependence between PUAS and FASBIS indicates the necessity of liquidity management instruments that include the integration of Islamic financial tools to facilitate Sustainable Development Goals (SDGs), especially those addressing financial access (Goal 8), resilient infrastructure (Goal 9), and economic stability in the situation of geopolitical uncertainty.

The findings show that while SBIS is isolated in terms of impact, PUAS and FASBIS are interdependent, and they make dynamic contribution in stabilizing the Islamic financial system. PUAS and FASBIS can play a more effective role in channelling financing to MSMEs by means of strengthening them through digital platforms, real-time interbank systems and standardized contracts in the context of digital transformation and sustainable growth. With digitalization, transparency and speed of transactions are enhanced, which means that the capacity of these instruments to promote an inclusive and sustainable economic performance is expected to grow, as per the SDGs and the essence of Islamic economics (T. T. H. Tambunan, 2023; Winarto & Beik, 2024).

These findings support the theoretical base of Islamic monetary transmission mechanism (Ascarya, 2012; Khan & Mirakhor, 1994) stating that Sharia-based monetary policy does not act on the basis of interest rate variations but through the process of liquidity creation and profit-loss-sharing. The lack of relevance of SBIS indicates that the instruments that are mainly liquidity absorbing are not of major effect to the financing of MSME because they do not directly inject funds into the productive sector. The opposite is however positive and significant role of FASBIS whereby liquidity-support facilities are able to stabilize the reserves of Islamic banks enabling them to lend to MSMEs in a more sustainable way (Ascarya, 2014).

The negative long-term coefficient of PUAS can be indicative of inefficiencies or frictions in the Islamic interbank money market, including limited standardization of contracts, low volume of transactions, or slow adoption of digital technologies, which have limited its capacity to spur financing. This finding is consistent with the argument by Ahmed et., all 2015 that monetary transmission can be undermined by poor Islamic interbank markets. Comprehensively, these results support the idea that liquidity-providing instruments (FASBIS) are more efficient transmission mechanisms in helping to finance MSMEs than liquidity-absorbing instruments (SBIS), which have predominantly a sterilizing role in the dual financial system (Boukhatem & Djelassi, 2022).

Implications for Policy and Sustainability

The empirical results provide some significant implications of Islamic monetary policy, financial inclusion, and sustainable development in Indonesia. The importance of FASBIS in

the long run is significant which highlights the importance of FASBIS as a Sharia compliant liquidity support facility which encourages productive MSME activities and consequently a wider creation of jobs and inclusion of the economy (Madani & Widiastuti, 2021). This observation is quite consistent with SDG 8 (Decent Work and Economic Growth), implying that Bank Indonesia can further empower the FASBIS mechanism by making it more accessible to smaller Islamic financial institutions to boost local-level economic development and resilience.

In the meantime, negative long-run effect of PUAS suggests that structural inefficiencies have been in existence in the Indonesian Islamic interbank money market. The solutions to these weaknesses involve reforms that aim at expanding the digital infrastructure, greater market transparency, and standardization of contractual mechanisms like *wakalah* and *murabahah* (Muhfiatun et al., 2021). These would not only enhance the efficiency of interbanking, but would also reduce the speed and better redistribution of liquidity, thereby promoting SDG 9 (Industry, Innovation, and Infrastructure) by promoting financial innovation in the Islamic monetary system.

Moreover, SBIS, the existing tool that mainly functions as a liquidity-absorbing tool, may be redesigned to conducive inclusive and sustainable financing (Johari et al., 2022). Connecting the issuance of SBIS to green MSME projects or socially responsible investment portfolios would make it a mechanism to facilitate SDG 10 (Reduced Inequalities) and monetary operations are in line with overall sustainability goals. Lastly, it is necessary to enhance the alignment of the Islamic monetary operations with digital platforms and real-time settlement systems. This type of digitalization would decrease the liquidity mismatches, make the Islamic monetary policy more responsive to market shocks, and increase the stability and inclusiveness of the dual financial system in Indonesia.

4. Conclusions

This paper concludes that out of the three Islamic monetary instruments studied; SBIS, PUAS, and FASBIS, only PUAS and FASBIS have a significant long-term impact on MSME financing in Indonesia with SBIS having no significant effect in the short or long run. As shown in the VECM and IRF, PUAS will lead to significant short-run reactions, whereas FASBIS is stabilizing in the long-run, and thus they are the more useful instruments in the financing of the real sector. On the other hand, SBIS as a passive liquidity-absorbing instrument seems to be weak in conveying the monetary policy to MSMEs. The results of the FEVD further support the hegemony of both PUAS and FASBIS in the dynamics of each other, but MSME financing is mostly self-driving. The findings highlight the necessity to reinforce the structure, integration, and digital capability of Islamic money instruments, especially SBIS, to provide more support to inclusive financing, sustainable growth, and resilience during digitalization and geopolitical uncertainty, which is in line with the Sustainable Development Goals (SDGs).

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Author Contribution

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