



# Analysis of Islamic Monetary Instruments and Islamic Bank Financing on Monetary Stability in Indonesia

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**Abstract.** This study aims to analyze the effect of Islamic monetary instruments and financing on monetary stability in Indonesia. This study uses the Vector Error Correction Model (VECM), Granger Causality Test, Impulse Response Function (IRF), and Forecast Error Variance Decomposition (FEVD) by first conducting a stationarity test, cointegration test, optimum lag test. The data used in this study is monthly secondary data from the variable amount of money in circulation (M2), Bank Indonesia Sharia Certificates (SBIS), Sharia Interbank Money Market (PUAS), State Sharia Securities (SBSN), and Islamic Banking Financing for the period January 2011.1 to December 2021.12. The results of the VECM Model research show that in the long term the instrument variables of SBIS, PUAS, and SBSN have a significant and positive effect on the Money Supply (M2). Meanwhile, Financing (FIN) has no significant effect on Money Supply. In the short term, only PUAS instruments are significant. The implication is that the monetary authority in setting policies must pay attention to its impact on yields of sharia monetary instruments because if the yield is increased it will certainly increase the amount circulating in the community, which in turn will affect monetary stability.

**Keywords:** Bank Indonesia Sharia Certificates · Sharia Interbank Money Market · State Sharia Securities · Financing · Vector Error Correction Model (VECM)

## 1 Introduction

The development of Islamic banking requires the monetary authority to implement Islamic monetary policy which is used to absorb excess liquidity in Islamic banks. The effectiveness of this Islamic monetary policy will be able to affect the monetary amount and monetary stability, especially Islamic monetary. The Central Bank is responsible for maintaining monetary stability and controlling the money supply because it can affect economic activities and the financial system, both conventional and Islamic finance.

The development of Islamic banking since its inception has shown a significant development, with Islamic Banking Financial Institutions as actors in the implementation of monetary policy. The development of Islamic banking is seen to have fluctuated, from assets and deposits at Islamic Commercial Banks (BUS), Sharia Business Units (UUS),

and Sharia Rural Banks (BPRS) for the period 2011–2020. In BUS asset growth can be seen from 2010 amounted to 97 billion and continued to increase until 2020 amounted to 593,948 billion, the development of this asset has increased every year.

The growth of assets and the number of Sharia banking deposits from 97 billion in 2010 to 593.948 billion in 2020 and the number of deposits in 2010 from 76.306 billion to 465.977 billion in 2020. The development of assets and deposits is expected to increase the role of Islamic banking in particular in increasing financing distribution. Islamic banks can encourage the growth of the real sector because the purpose of Islamic economic activity is to support productive activities, assist the community in accumulating capital, and distribute wealth to achieve prosperity for all (Ramadhan, 2013).

The development of Islamic banking will contribute to the implementation of the dual monetary system in Indonesia so that it has given birth to Sharia monetary instruments such as Bank Indonesia Sharia Certificates (SBIS), where SBIS is a substitute for SWBI and Sharia Money Market Securities (PUAS). The application of this Sharia monetary instrument will affect the Sharia monetary stability.

## 2 Literature Review

Monetary policy has the ultimate goal of achieving and maintaining real economic growth, reducing inflation, and reducing unemployment. For this reason, it is important for monetary policymakers to influence economic variables. In conventional economics, monetary policy instruments cannot be separated from the practice of interest rates and speculation. On the other hand, Islam prohibits both practices, so monetary policy instruments in Islam work by regulating the profit-sharing ratio (Amrial et al. 2019).

Money in the Islamic concept belongs to the community (public goods). The activity of hoarding money or not producing money will result in a reduction in the money supply, which will hamper the economic process. This is as explained in the Qur'an surah At-taubah verses 34, meaning "*And there are those who bury gold and silver and spend it not in the way of Allah. Announce unto them a most grievous penalty*".

According to Zein (2015) money in the Islamic concept only functions as a medium of exchange and a unit of account, so the function of money as a traded commodity is not justified. Money must also rotate (money as flow concept) in order to create prosperity for the community. Islamic monetary policy is implemented by Bank Indonesia in the format of a dual monetary system to achieve the single goal of maintaining stability in the value of the rupiah. The history of Islam explains that monetary policy is clearly implicit in the life of the Prophet Muhammad and his companions. Islamic monetary policy instruments according to Chapra (in Esya 2013), are the growth target in M and M0, this target of the money supply will determine the economic growth of a country, so the growth in the money supply needs to be kept under control.

### 2.1 Islamic Monetary Policy Transmission Mechanism

Monetary transmission mechanism according to ISRA (International Shari'ah Research Academy for Islamic Finance) 2015, how monetary policy works for the Islamic banking system and Islamic financial markets play a role in the monetary policy process. Islamic

monetary policy acts as a supporter of the real sector. Money and banking institutions are the two most important parts that must be used to achieve the objectives of Islamic monetary policy.

## 2.2 Islamic Money Supply Theory

According to Al-Ghazali, the main function of money is as a medium of exchange that reflects the value of a commodity, while according to Ibn Khaldun, money has three main functions, namely, as a standard of value, as a medium of exchange, and as a store of wealth (Marthon, 2004). The philosophy of the function of money in the concept of Islamic economics is: how money can function optimally to move the real sector and ignore the possibility of becoming a commodity that is traded through speculative because currency speculation behavior can be associated with gambling which is forbidden in Islam (Yuliadi, 2008). Meanwhile, according to (Sakti 2006) in Ascarya (2007) the existence of the economic essence of money (in an Islamic perspective) can take place better, namely by maintaining and increasing the velocity of property among humans (economic actors).

According to Amrial, Mikail and Arundina (2018) the demand for money in an Islamic economy is oriented towards equity which is determined by the expected rate of return based on the profit-sharing principle. So that it is different from the previously determined interest rate, the expected profit-sharing rate does not fluctuate or depend on economic conditions. Thus, the aggregate demand for money for transaction needs tends to be relatively stable. Greater stability in money demand transactions tends to provide greater stability in earnings turnover at certain phases of the business cycle and makes people's behavioral expectations more predictable.

## 2.3 Previous Study

Bayuni and Ascarya (2010) conclude from the results of their research using VAR as a methodology that the monetary amount is stable in the short term, and in the long term SBI and SBIS are not defined and the monetary amount is only stable and effective savings that have an effect in the long term, while the other variables are only stable and effective short term. Lestari (2013) shows the results of research that SBIS, Fasbis, IMA, and Liquidity only have a short-term relationship, while the long-term does not.

Likewise, Sangidi (2014) the results of his research on the effectiveness of Islamic monetary transmission through the financing channel stated that Islamic bank financing can have a positive effect on output growth, while SBIS has a negative effect on output. Dwihapsari, et al., (2021) conducted a study on the analysis of the effectiveness of monetary policy in conventional and Sharia perspectives on inflation in Indonesia from 2013–2020. The variables used are credit, and SUN for conventional monetary policy, while for Islamic monetary policy the variables used are SBIS, FIN, and SBSN using the VECM methodology. The results show that SBI has a negative and significant relationship that increasing interest rates have an effect on reducing inflation. While the results of the IRF and FEVD effectiveness tests explain that conventional monetary policy does not take long to reduce inflation, on the contrary, Sharia monetary policy.

## 2.4 Hypothesis

The framework of the hypothesis in this study is that SBIS, PUAS, SBSN, and FIN have a significant and positive effect on Monetary Stability.

## 3 Research Methods

This study uses the variables of Bank Indonesia Sharia Certificates (SBIS), Sharia Interbank Money Markets (PUAS), and National Sharia Securities (SBSN) as sharia monetary control variables in Sharia Commercial Banks (BUS), Islamic Bank Financing (FIN). While the monetary stability variable uses data on the money supply (M2). The data used are sourced from secondary data, journals, articles, literature studies, and the results of previous research related to research problems.

The object of this research is to identify the Islamic monetary transmission process and prove whether there is a balance between the real and monetary sectors created through the sharia financing mechanism that is able to control the money supply in Indonesia as monetary stability. The research period is 2011:1–2021:12 or using monthly data.

This study will use a time series methodology with a Vector Autoregression (VAR)/Vector Error Corection Model (VECM) approach, this method is often considered an approach that is not based on a particular economic theory (Gujarati, 2009, Widarjono, 2007, Tanjung and Devi, 2013 in Esya, 2013). The variables used in this study can be described by the following model:

$$SM/(JUB) = a + b_1 SBIS + b_2 PUAS + b_3 SBSN + b_3 FIN + e$$

The operational definition of each variable in this study is as follows:

- (1) Bank Indonesia Sharia Certificate (SBIS)  
SBIS is the main indirect instrument of regular sharia monetary policy through open market operations, which are instruments that absorb short-term liquidity in sharia banking. SBIS are short-term securities based on sharia principles in rupiah currency issued by Bank Indonesia. SBIS in this study is the rate of return on SBIS for Islamic commercial banks obtained from Islamic banking statistics in Bank Indonesia reports for the period January 2011–December 2021.
- (2) Sharia Interbank Money Market (PUAS)  
PUAS is a short-term financial transaction activity between market participants based on sharia principles and not based on interest. In order to improve the efficiency of fund management, banks conducting business activities based on sharia principles require an interbank money market (interbank call money). PUAS in this study represents the total PUAS transactions obtained from Islamic banking statistics in the Bank Indonesia report for the period January 2011–December 2021.
- (3) State Sharia Securities (SBSN)  
SBSN is issued based on sharia principles as evidence of the participation in SBSN assets, both in the form of rupiah and foreign currency where SBSN assets are State property. SBSN data used is Total SBSN whose data is obtained from OJK Sharia Banking Statistics from January 2011–December 2021.

(4) Total Financing (FINC)

FINC is all financing provided by sharia banking, especially sharia commercial banks to third parties, either using mudharabah or musharakah contracts. The data used in this study is total financing, which is obtained from Islamic banking statistics in the Bank Indonesia report for the period January January 2011-December 2021.

(5) Monetary Stability (Amount of Money Supply)

The proxy of monetary stability is used data on the amount of money in circulation which is used in this study, the money supply in a broad sense (Broad Money), namely Total M2. The data is obtained from Bank Indonesia's Economic and Financial Statistics for the period from January January 2011–December 2021.

## 4 Result and Analysis

### 4.1 Stationarity Test

A stationarity test is needed to avoid spurious regression. The stationarity test that has been carried out consists of:

- a) Unit Roots Test. This unit root test is conducted to observe whether certain coefficients of the estimated autoregressive model have a value of one or not. The first step is to estimate the autoregressive model of each variable used (Siagian, 2003). To test the behavior of the data, in this study the Augmented Dickey-Fuller (ADF) test was used. The first step for this ADF test is to estimate the model of each variable used. The procedure is to determine whether the data is stationary or not by comparing the ADF statistical value with the critical value, namely the MacKinnon statistical distribution. If the absolute value of the ADF statistic is greater than the critical value, then the observed data is stationary (Widarjono, 2009). The data can also be seen on the probability value, if the probability value is less than the 1%, 5%, and 10% levels, the data is stationary at that level. Based on the test results obtained, it can be seen that not all variables are stationary at the level, the stationary one is SBIS, while other variables such as PUAS, SBSN, FINC, and SM/JUB are not stationary. For this reason, all variables need to be tested further, namely the degree of integration test (first difference).
- b) Integration Degree Test. The degree of integration test is only needed if all the data is not stationary at the Level or 1 (0) degree. The degree of integration test is used to determine to what degree the data will be stationary. According to Shochrul (2011) if the data is not stationary at the first degree, then the test must continue until each variable is stationary. The degree of integration test is the same as the unit root test, the assessment of the stationarity of the data is seen from the comparison of the Augmented Dickey-Fuller statistical test value to the critical value (test critical values) with an error tolerance level of = 5% or 0.05. If the critical value is greater than the ADF t-statistic result, the research variable is declared to have passed the stationary test and vice versa. Based on the test results obtained, it can be seen that the variables are stationary at the first degree of integration except for Financing (FIN) at the second level, but all variables in the integration test are stationary.

## 4.2 Cointegration Test

To perform the cointegration test, the prerequisite is that the data is stationary. A cointegration test is conducted to determine whether there is a long-term relationship between the independent variable and the dependent variable. The cointegration test is intended to test whether the resulting regression residual is stationary or not. In addition, the cointegration test is intended to determine whether there is a long-term relationship in the study or not.

In this study, the cointegration test used is the Johansen Cointegration Test. If the value with trace statistic value and maximum eigenvalue statistic is greater than the critical value at 5% alpha, then there is cointegration. Based on the results of the cointegration test for both the Trace test and the maximum eigenvalue, it shows that there are five cointegration ranks at the 5% (percent) level of significance. These results indicate that the model is cointegrated and can be continued using VECM (Vector Error Correction Model).

## 4.3 Optimum Lag Determination

In the VAR/VECM model, the determination of the optimal lag is a very important step. The purpose of building a VAR model is to see the behavior and relationships of each variable in the system. The optimum lag test is used to determine the period of influence of a past endogenous variable and its influence on other variables. To determine the optimal lag length, there are parameters that can be used, namely Akaike Information Criterion (AIC), Schwartz Information Criterion (SIC), and Hannan-Quinn Information Criterion (HQ).

The optimal lag length used in this study is based on the shortest lag using AIC. The VAR model will be estimated with different lag levels and then the smallest value will be used as the optimal lag value. Based on the results of the optimum lag test, it is found that both the LR, FPE and AIC tests show that the lowest value is in lag three, or there is an asterisk that indicates that the optimum value is at lag 3. The results of this lag test will be used in the VECM test.

## 4.4 VAR Stability Test

The purpose of the VAR stability test is to further analyze the VAR results because if the VAR estimation results to be combined with the error correction model are unstable, the Impulse Response Function and Variance Decomposition will be invalid. To test whether the VAR estimation is stable or not, the VAR stability condition is checked in the form of roots of the characteristic polynomial. A VAR system is said to be stable if all its roots have a modulus smaller than one (Gujarati, 2003). From the result, it can be seen and concluded that the VAR system is stable because the tested modulus has a value of less than one, which ranges from 0.536257–0.894990 so it can be concluded that the VAR model formed is stable at its optimal lag.

#### 4.5 Granger Causality Test

Granger causality test is a method to find out where a dependent variable can be influenced by other variables (independent variable) and the other side of the independent variable occupies the position of the dependent variable. To see Granger causality can be seen by comparing the F-statistics with the critical value of the F-table at the confidence level (1%, 5%, or 10%) and can be seen by comparing the profitability value with the confidence level (1%, 5% or 10%). If all variables have an F-statistical value greater than the F-table value at a significant level, then both variables have two-way causality. From the results of the causality test above, it is found that all variables have two directions of influence.

#### 4.6 Vector Error Correction Model (VECM) Estimation Results

After the stationarity test, cointegration test, optimum lag test, and stability test have been carried out, then the VECM estimation is carried out. This model is a restricted VAR model, where the data is not stationary but cointegrated. In addition, this VECM model describes an econometric model that can be used to determine the short-term behavior of a variable in the long term, due to a permanent shock (Kostov and Lingard, 2000).

The VECM results show a long-term relationship from the VECM test, showing that the financing variable has an insignificant effect on the money supply (M2), as well as the t-statistic value of 0.82885 and 0.06290 with coefficients of 2.001107 and 0.035350, respectively. The meaning of this coefficient value is that if there is an increase in financing by 1%, it will increase financing by 2.001107% and 0.035350%, respectively. While PUAS and SBSN have a significant effect on the money supply (M2) with t-statistic values of -6.37652 and -2.34864, respectively. With coefficients of -163.2208 and -0.244253, respectively, which means that every 1% increase in PUAS and SBSN will affect the money supply (M2) by negative 163.2208% and 0.244253%. For the short-term relationship, only the PUAS variable has a significant effect on the Money Supply (M2), while the other variables have no effect.

#### 4.7 Impulse Response Function (IRF) Analysis

Impulse Response Function (IRF) Impulse response function (IRF) analysis is a method used to determine the response of an endogenous variable to the shock of a particular variable. The impulse response function (IRF) provides the direction of the relationship and the magnitude of the influence between endogenous variables because it shows the effect of one standard deviation of the shock endogenous variable on other endogenous variables and the variable itself.

Based on the results of the IRF test, it can be explained that the response to the money supply variable is caused by the financing variable, PUAS, SBIS, SBSN, and the money supply itself (M2). The Shock of Financing on the money supply in response was quite stable and positive by the amount in circulation (M2) starting from the beginning to the 10th period which showed stability, only slightly in the 5th period there was a slight decrease, but after the 6th period, it stabilized towards convergence until the next period.

10. The response to the money supply (M2) to the M2 shock itself shows that in the early stages it was very high, but only in the initial period, in the second period it continued to fall until it reached a convergent condition and was stable until the 10th period and was positive. This shows that the response of the M2 shock itself to be stable takes quite a long time. However, different Islamic monetary instruments, both PUAS and SBIS, have the same tendency, where the PUAS and SBIS shock to JUB (M2) fluctuations starting from the early stages show the influence of Islamic monetary instrument variable shocks on JUB stability from the beginning of the period to the 10th period and is in the positive and stable quadrant especially SBIS against JUB.

Likewise, the SBSN sharia monetary variable showed stable results throughout the period even though there was a little turmoil, but tended to be more stable and positive. For Islamic monetary instruments, both PUAS, SBIS, and SBSN have the same tendency, where the shock is responded to by financing starting from the early stages, this shows an always increasing influence on financing, this shows the impact of the shock of Islamic monetary instruments on increasing financing starting from the beginning of the period until the 10th period and is in the positive and stable quadrant.

For the results of the PUAS variable IRF test where the shock of the money supply variable was responded by PUAS slightly decreased at the beginning of the period and fluctuated, but tended to be stable until the 10th period and was positive. While the PUAS shock itself was responded to by PUAS from the initial stage, it showed a sharp decline at the beginning of the period, but after the second period the fluctuation was quite stable until period 10, this was responded to in the positive quadrant. However, unlike the SBIS fluctuation, the PUAS variable was responded to in the positive and stable quadrant from the beginning of the period to the end of the period, as well as SBSN.

The results of the IRF test for other Islamic monetary instrument variables SBIS and SBSN show that the fluctuations in the money supply variable in response to SBIS are relatively stable from the initial period to the last period in period 10, although there is a slight fluctuation in the early stages of small fluctuations, the stability is in the line position. Convergent. The JUB shock to SBIS is stable and is in the negative quadrant. For the variable shock SBIS to SBIS in the early stages, it decreases until the 4th period but tends to be more stable until the 10th period and is in the positive quadrant.

#### **4.8 Analysis of Variance Decomposition**

Analysis of variance decomposition or known as Forecasting Error Variance Decomposition (FEVD) or Variance Decomposition is used to calculate and analyze how much random shocks from certain variables have on endogenous variables or are used to predict the contribution of the percentage variance of each variable due to changes in certain variables in the system. FEVD produces information about the relative importance of each random innovation or how strong the composition of the role of the variable is to other variables in the VAR/VECM model. More importantly, FEVD can also know which variable shock has an important role in explaining changes in other variables (Widarjono, 2007, Gujarati, 2009, Tanjung and Devi 2013, Esya 2013).

The results of the FEVD test in the table above can be analyzed that the contribution of the composition of variance to the money supply variable (M2) is mostly dominated by the M2 variable itself, at the beginning of the period it shows a high composition,



but the longer the percentage decreases, this can be seen until the period 10 is still above 63%. Then the second place is PUAS with its composition contribution showing an increasing number until the 10th period at 19.3%. Furthermore, the contribution of the third variant composition is FIN, SBSN, and SBIS with the highest composition of 9.40%, 6.8% for SBSN, and 0.4% for SBIS in the 10th period.

## 5 Discussion

From the results of the VECM test, in the long term, the influence of Islamic monetary variables on the money supply has a negative relationship with SBIS, PUAS, and SBSN. This means that sharia monetary policy instruments have an inversely proportional effect on the money supply, whereas the expansionary monetary policy will reduce the yield of sharia monetary instruments, namely SBIS, PUAS, and SBSN, which will reduce the money supply M2.

The results of the impulse response function (IRF) test show the Islamic monetary variables SBIS, PUAS and SBSN have a positive response to JUB (M2) fluctuations, where the shock of Islamic monetary instrument variables affects the stability of the money supply. This has the implication that when there is an increase or decrease in the Sharia monetary instrument, M2 will respond positively, or in other words, if there is an increase in the outstanding amount due to an increase in the shock of the Sharia monetary instrument. The consequence, of course, on policymakers, in this case, the monetary authority, is that when the authorities carry out policies, both expansionary and contractionary, the M2 money supply will respond positively.

## 6 Conclusion

The effect of SBIS on monetary stability in Indonesia is negatively related, this is shown by the results of the VECM, and the results of the impulse response function responding to monetary stability (money supply) are positive when there is a shock to the SBIS, which means that an increase in SBIS yields will increase the amount of money. Circulating (M2). The results of the Variance Decomposition test, the contribution of SBIS to the money supply is not very small, namely 0.4% in the 10th period.

The PUAS variable in influencing monetary stability has a negative effect. The results of the IRF test show that the shock of the PUAS variable increases and is positive for monetary stability. This is in accordance with the theory of monetary policy where PUAS is a sharia monetary instrument that can regulate sharia banking liquidity so that it can affect the money supply of M2. The results of the VD test explain that the contribution of PUAS to the money supply is relatively larger than that of SBIS, which is 19%.

The effect of financing on monetary stability is positive and significant. Then from the IRF test, it was concluded that the financing was responded negatively by the outstanding amount. Judging from the analysis of Variance Decomposition, it can be stated that the contribution of financing to the outstanding amount is small.

The effect of the SBSN variable on monetary stability is negative. The results of the Impulse Response Function (IRF) test show that the circulating amount is positive and stable. Judging from the Variance Decomposition analysis, it can be stated that the contribution of SBSN to monetary stability is very small.

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