Effectiveness of Monetary Policy Transmission Through Sharia and Conventional Instruments in Influencing Inflation in Indonesia

Ishak[1], Nur Ariani Aqidah[2], Mikdar Rusydi[3]
IAIN Palopo[1,2], Kolej Universiti Perguruan Ugama Seri Begawan Brunei Darussalam[3]
ishak@iainpalopo.ac.id[1], nurariani_aqidah@iainpalopo.ac.id,[2] mikdar.rusdi@kupu-sb.edu.bn[3]

ABSTRACT
This study investigates the influence of the transmission of monetary policies through the Sharia and Conventional monetary policy instruments on Indonesian inflation using data analysis techniques such as the Vector Error Correction Model (VECM). The data of this study was obtained from financial statements of the Annual Report of Indonesian Economic and Financial Statistics (2016 to 2020), Consumer Price Index (CPI) data taken from the Central Bureau of Statistics (BPS; 2016 to 2020), from Banking Statistics Annual Reports (2016 to 2020), and from the Islamic Banking Statistics Annual Reports (2016 to 2020). The test results on the sharia instrument indicators show a negative reaction of the Consumer Price Index to shocks in FINC and SBIS, but a positive reaction to shocks in third-party funds and Islamic interbank money market. According to the test results on the conventional instrument indicators, the Consumer Price Index responds negatively to shock in LOAN, DPK, and SBI, and positively to shocks in PUAB.

Keywords: *Conventional Instruments, Monetary Inflation, Sharia Instruments, Transmission of Monetary Policy*

A. INTRODUCTION

According to the monetary economic theory and practice in several central banks, the transmission of monetary policy has always been an important topic and has drawn the attention of economists and monetary authorities. Such importance is reflected in two questions raised by Blinder (1999), namely, (i) whether monetary policy can affect the real economy in addition to affecting prices, and if so, (ii) through what kind of transmission mechanism will the monetary policy influence the economy. These two questions raised an important, however controversial issue

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in the formulation and implementation of monetary policy by the central bank and in the discussion of monetary economic theory by economists.

Monetary policy is a policy action assumed by the monetary authority to regulate money supply (meaning money supply or money in circulation) and credit (Nopirin, 2013). The monetary authority formulates the monetary policy that includes control over monetary instruments to create an economy that grows sustainably. This achievement is marked by attaining a stable macroeconomy, as shown by low inflation, developments in the real sector, payment balance, and an increased availability of job opportunities. In line with the Quantity Theory of Money postulated by Fisher (1922) money supply is directly and systematically correlated with real output and inflation (P Warjiyo, 2004).

Basically, the mechanism behind monetary policy transmission can be described by looking at how the monetary policy adopted by the central bank affects the many economic and financial activities so that, in the end, they can achieve the final stated goal. Specifically, Taylor (1995) said that the monetary policy transmission mechanism is "the process through which monetary policy decisions are transmitted into changes in real GDP and inflation".(Arno et al., 2021).

In Indonesia, the way monetary policy is transmitted by the Central Bank as a monetary authority can affect many economic and financial activities that appear in society. According to Law no. 23 of 1999, which was amended by Law no. 3 of 2004, the purpose of Bank Indonesia is to achieve and maintain stability in the value of the rupiah, specifically concerning price (inflation) and the rupiah exchange rate. Several monetary policy instruments are involved in carrying out the central bank's purpose, including Open Market Operations (OPT), Rupiah intervention, currency sterilization foreign exchange, discount facilities, Statutory Reserves (GWM), and Certificates Wadiah Bank Indonesia (SWBI). The question is how the transmission mechanism established since these monetary instruments began being used by Bank Indonesia to influence economic and financial activities may come to achieve the goals at the end of the monetary policy.

Monetary policy transmission is the process through which monetary instruments work, changing monetary policy and affecting decisions that may influence economic activity, which in turn impacts output and inflation (Atkin & Cava, 2017). Knowledge of the monetary transmission policy is the main supporting factor that can be used to measure the monetary policy influence on future economic growth and development (Rashid et al., 2019). The effectiveness of monetary policy transmission is used as a benchmark to determine the best path in terms of contribution to reaching the monetary policy goal, which is then used

as the basis to formulate monetary policy, and to identify how much influence and deadlines are needed for the transmission line to work (McCarthy & Peach, 2002).

Indonesia has officially implemented a dual banking system since the enactment of Banking Law Number 10 of 1998, meaning that conventional banks and Islamic banks can carry out their operational activities in a conventional manner and according to the sharia principles. Somewhat recently Law No. 23 of 1999 passed and established that the monetary authority can carry out monetary policy with sharia and conventional principles as one of the actions to support sharia banking institutions. Accordingly, Indonesian monetary policy also adheres to the Dual Monetary System, implementing monetary policy through indicators and instruments of both conventional and sharia natures (Ascarya, 2012). Having applied the Dual Banking System in the monetary system, the monetary authority will have several possible paths available to achieve its ultimate goal (Manurung, 2008). According to Ascarya (2012), with the enactment of the dual banking and dual monetary systems, the monetary authority is responsible for maintaining the monetary stability and the synergy of the two systems in an effort to achieve prosperity within the scope of the Indonesian economy. To determine the extent of the influence of the monetary policy on the inflation rate, a transmission mechanism is needed. The transmission mechanism contains several indicators involving the banking sector, Islamic banking, and conventional banking.

Several studies have discussed how monetary policy instruments can influence economic growth and inflation. Sharia and conventional instruments have been reported to have the same influence on the inflation rate values (Sudarsono, 2017). Ascarya reported a positive impact of the monetary policy transmission with sharia instruments on output and inflation. Meanwhile, the monetary policy transmission with conventional instruments has a negative impact on output and inflation (Perry Warjiyo et al., 2004). In contrast, the monetary policy transmission with financing as an indicator responds negatively to inflation (hadi & Afifi, 2020).

The Sharia 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 sharia monetary policy objectives. Chapra (1990) stated that monetary policy aims to achieve socio-economic values of the Islam. However, to accomplish such objectives, the trajectory from previously established policies until achieving the established goals is very complex and time-consuming (time lag). The mechanism starts from the decision of the authority of central bank, a partner of the government, to alter the monetary instrument and operational targets, affecting

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several economic variables and finance through the interaction of central banks, banking institutions and the financial sector, and, finally, the real sector.

The transmission mechanism basically describes how the monetary policy can affect the many economic activities and finances to achieve the goal of arranging a suitable money supply with real demand, helping meet the need to cover the government deficit. In contrast, the monetary policy transmission mechanism is carried out with sharia principles to achieve the final target of output and inflation (Tamanni, 2021).

One of the methods used in the Sharia monetary transmission policy is the implementation of sharia monetary operations through Open Market Operations (OPT) with SBIS instruments. This implementation aims to influence the return rate of the Sharia Interbank Money Market (PUAS), which ultimately affects Islamic banking financing. This is assumed to affect the real sector, which is expected to be able to achieve monetary policy targets.

Several studies have reached different conclusions concerning the existence of research gaps in the comparison of monetary policy through sharia and conventional instruments. This is an interesting topic to be reviewed. Therefore, this study aims to analyze the effectiveness of monetary policy transmission through sharia and conventional instruments in influencing inflation in Indonesia (Ahmad, 1992).

B. THEORITICAL

Monetary policy is a policy used by the central bank as the holder of the monetary authority in an effort to control money supply and credit with the ultimate goal of influencing people's economic activities (Nopirin, 1996) . In a broad sense, monetary policy is defined as the efforts or policies of Bank Indonesia in influencing the growth and development of monetary variables (money supply, interest rates, exchange rates, and credit) to achieve an economic objective. The objective of a monetary policy is to encourage the achievement of macroeconomic objectives, including the provision of employment and economic growth (Priskila & Nurhasanah, 2021). Price stability, in this case, is reflected in the inflation rate and payments balance (Madani & Widiastuti, 2021).

The influence of the monetary policy process in the real sector is important due to its close relation to almost all aspects of the economy. In particular, the monetary policy transmission mechanism is a process that has an impact on real changes in output and inflation (Taylor, 1995; P Warjiyo, 2004). and changing effectiveness over time depending on the financial structure and economic

conditions. There are six channels in the conventional monetary system that act in the transmission of monetary policy, namely the conventional instruments, interest rate channel, asset price channel, exchange rate channel, and the expectation channel. Some of these paths cannot be applied in an Islamic-based economic system, such as the conventional instruments, where the indicators are identical to those of the interest system (Ponziani & Mariyanti, 2020).

Some empirical evidence showing the results of the analysis of the monetary policy transmission through sharia and conventional instruments in influencing inflation are based on Sudarsono's findings, (2017) Sudarsono's and other similar studies have concluded that the pattern of influence of the conventional and Islamic monetary transmission variables on the magnitude of the inflation rate was almost the same (e.g. Saeed et al., 2021), and (Tamanni, 2021; Wei & Han, 2021; Perry Warjiyo, 2016). These results are in line with Hadi & Afifi (2020) who also stated that sharia and conventional instruments as transmission lines of monetary policy have the same influence on the inflation rate. In particular, Karima (2018) concludes that SBIS, PUAS, TPF, and FINC do not have a long-term effect on inflation and, in the long run, have a negative effect on inflation.

C. METHODOLOGY

This study uses a quantitative approach. The research data was obtained from the Indonesian Economic and Financial Statistics (SEKI) annual report (2016 to 2020), Consumer Price Index (CPI) of the Central Statistics Agency (2016 to 2020), and the Financial Statement of the Banking Statistics/Islamic Banking Statistics Annual Report (2016 to 2020). The indicators of the Sharia instrument variables used in this study include the Sharia Bank Total Financing (FINC), Sharia Bank Third Party Funds (DPK), Sharia Bank Indonesia Certificates (SBIS), and Sharia Interbank Money Market (PUAS). The indicators of conventional instrument variables include the Conventional Bank Total Credit (LOAN), Conventional Bank Third Party Funds (DPK), Bank Indonesia Certificates (SBI), and Interbank Money Market (PUAB).

The problem in this study can be answered using a regression analysis, specifically the Vector Auto Regression (VAR) technique. The VAR method becomes very important in determining the level of influence of economic variables where a cause-and-effect relationship is observed in the economic sphere. The VAR model can also clearly describe the behavior of variables in the economy. The Vector Auto Regression model is used if the data is stationary at the degree level

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and there is no indication of cointegration. However, if the data used is stationary at the first difference or second difference level and cointegration is indicated, then the data test is carried out using the Vector Error Correction Model (VECM).

The VAR/VECM estimation model is carried out in several stages, which are: stationarity test, optimum lag length test (Lag Optimal), cointegration test, stability test, causality test, IRF (Impulse Response Function) test, and FEVD (Forecast Error Variance Decomposition) test (Tamanni, 2021).

D. RESULTS AND DISCUSSION
RESULT
Impulse Response Function (IRF)

Impulse Response tests aim to show the level of shock experienced by a variable with other variables in a certain time span so that the period of shock of a variable against other variables can be known.
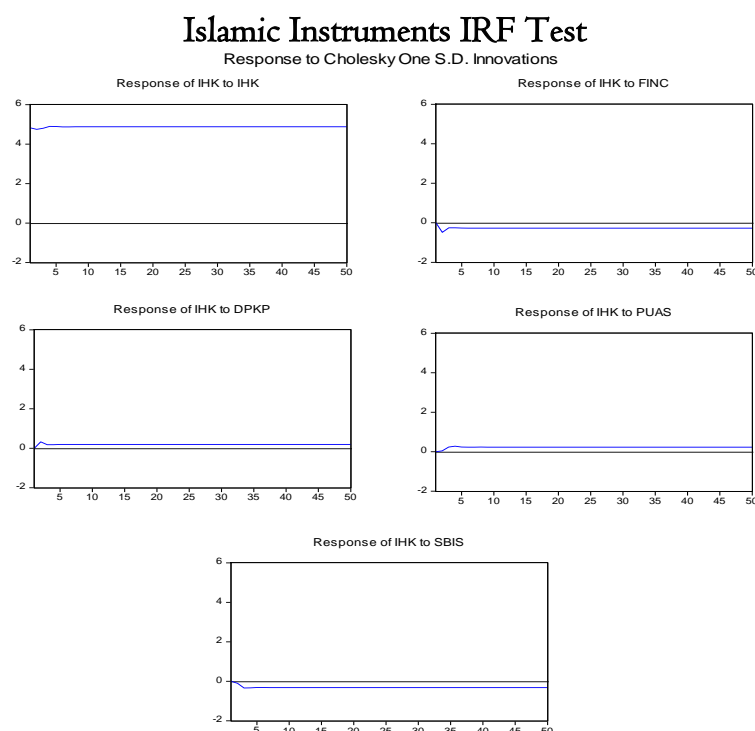

Figure 1. The results of the Impulse Response Function of Islamic instruments
Source: Processed data, 2021

The results of the IRF test on the indicators of sharia instruments (Figure 2) show that the CPI responds positively to changes in the CPI. The CPI response

to the shock or shock experienced by the CPI caused the CPI indicator to fluctuate from the first to the fourth period, showing a balance and reaching a stable point in the sixth period. Meanwhile, the CPI gave a negative response to changes in FINC. The CPI response to the shocks experienced by FINC caused the CPI indicator to decline in the first period to the second period, increase in the third period and then show a balance and reach a stable point in the third period.

The CPI also responded negatively to changes in the SBIS. The CPI response to the shocks experienced by the SBIS caused the CPI indicator to decline in the first to the third period and show a balance and reach a stable point in the third period. A positive response was shown by the CPI to changes in Sharia Bank Deposits. The CPI response to the shock or shock experienced by Sharia Bank DPK caused the CPI indicator to fluctuate in the first to the fifth period, and show a balance and reach a stable point in the fifth period. The CPI also responded positively to changes in PUAS. The CPI response to the shock or shock experienced by PUAS caused the CPI indicator to increase from the first to the fourth period, reduce in the fifth period, and show a balance and reach a stable point in the fifth period.

Conventional Instrument IRF Test
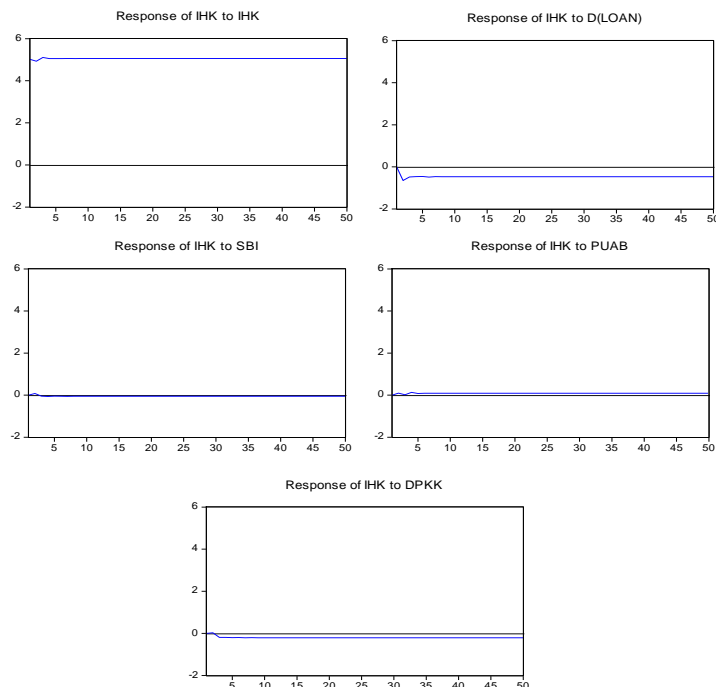
Figure 2. Impulse Response Test Results Conventional Instruments

Source: Processed data, 2021

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The results of the IRF test using the conventional instrument indicators above show a positive response of the CPI. The CPI response to the shock or shock experienced by the CPI caused the CPI indicator to fluctuate from the first to the fourth period, and show a balance and reach a stable point in the sixth period. Meanwhile, the CPI responded negatively to changes in LOAN. The CPI response to the shock or shock experienced by the LOAN caused the CPI indicator to fluctuate in the first to the eighth period and show a balance and reach a stable point in the eighth period. On the other hand, the CPI responded negatively to changes in conventional bank deposits. The CPI response to the shock or shock experienced by conventional bank deposits caused the CPI indicator to decline in the first to the third period and show a balance and reach a stable point in the third period.

The CPI also exhibited a negative response to changes in the SBI (Figure 3). The CPI response to the shock or shock experienced by the SBI caused the CPI indicator to fluctuate in the first to the fifth period and show a balance and reach a stable point in the fifth period. The CPI showed a positive response to changes in the interbank money market. The CPI response to the shock or shock experienced by the PUAB caused the CPI indicator to fluctuate in the first to the sixth period and show a balance and reach a stable point in the sixth period.

Forecast Error Variance Decomposition (FEVD)

The Forecast Error Variance Decomposition test aims to determine the extent of the influence of random shocks from certain variables on endogenous variables.

Sharia Instrument FEVD Test

The Variance decomposition (VD) on Islamic instruments was used to identify the contribution of the PUAS, SBIS, and FINC variables to changes that occur in the CPI in the future.

Table 1. Sharia Instrument FEVD Test Results

Period	CPI	FINC	DPKP	SATISFID	SBIS
2	99.24211	0.510186	0.220685	0.003564	0.023459
17	98.92372	0.325695	0.156905	0.203974	0.389709
24	98.91339	0.320046	0.155958	0.206626	0.396227
27	98.91061	0.318525	0.154570	0.210515	0.405781

31	98.90774	0.316957	0.154059	0.211947	0.409297
47	98.90116	0.313358	0.152887	0.215230	0.417364
50	98.90040	0.312941	0.152751	0.215611	0.418300

Source: Data processed, 2021

Table 1 shows the results of the analysis of variance decomposition. The variable with the largest contribution to the CPI was CPI itself at 100% and 99.25% in the first and second periods, respectively, followed by FINC at 0.510%, TPF 0.220%, SBIS 0.023% and PUAS at 0.003% (Table 1). In the 24th period, the indicator with the largest contribution to the CPI was the CPI itself, followed by SBIS, FINC, PUAS, and DPK. In the 50th period, the largest contribution was still shown by the CPI 98.90%, followed by SBIS (0.418%), FINC (0.313%), PUAS (0.216%), and TPF (0.153%). The VD shows that the CPI, FINC, and TPF values tend to decrease from period to period while the SBIS and PUAS tend to increase.

Conventional Instrument FEVD Test

Variance Decomposition (VD) on conventional instruments to observe the contribution of the LOAN, PUAB, and SBI variables to the changes experienced by the CPI in the future.

Table 2. Conventional Instrument FEVD Test Results

Period	CPI	LOAN	DPKK	PUAB	SBI
2	99.12086	0.848004	0.001219	0.028219	0.001697
17	98.96293	0.851572	0.173979	0.009396	0.002124
24	98.95565	0.851682	0.182096	0.008523	0.002045
27	98.95369	0.851712	0.184284	0.008287	0.002024
47	98.94703	0.851812	0.191724	0.007487	0.001952
50	98.94649	0.851821	0.192326	0.007422	0.001946

Source: Data processed, 2021

The variable with the largest contribution to the CPI in the first and second periods was the CPI itself at 100% and 99.12%, respectively, followed by LOAN (0.848%), PUAB (0.028%), SBI (0.002%), and TPF (0.001%; see Table 2). In the 24th period, the indicator with the largest contribution to the CPI was CPI itself, followed by LOAN, DPK, PUAB, and SBI. In the 50th period, the largest

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contribution was still shown by the CPI itself (98.95%), followed by LOAN (0.852%), TPF (0.192%), PUAB (0.007%), and SBI (0.002%). The VD results showed a downward trend for PUAB, SBI, and CPI from period to period.

DISCUSSION

This study evaluated Consumer Price Index (CPI) data as a proxy for inflation, and total Islamic bank financing (FINC), Sharia Bank third party funds (DPKp), Indonesia Sharia Bank Certificates (SBIS), and Sharia Interbank Money Market (PUAS) as indicators of Shariah bank financing. The variables indicating conventional bank credit lines were Total credit variables (LOAN), conventional bank third party funds (DPKk), Indonesia Bank Certificates (SBI), and Interbank Money Market (PUAB). These indicators were used to determine the influence of the financing and credit channels on inflation as the final objective of monetary policy through the Vector Auto Regression (VAR) approach. However, due to the cointegrated indications for all variables, further data testing was carried out using the Vector Error Correction Model (VECM). VECM estimation provided a limited explanation of the dynamic movement, other than the VECM structural equation, which is a bit difficult to interpret. Accordingly, some researchers have suggested that the Impulse Response Function and Factor Error Variant Decomposition be further tested (Setiawan, 2019).

Tests of the sharia instrument indicators using the Impulse Response Function showed a different response for each indicator. The results of the CPI test showed a negative response of the Impulse Response Function to shocks that occur in Islamic bank financing. This indicates that any increase in Islamic Bank Financing will lead to a reduced CPI. The results of this study contradict research studies stating that the CPI responds positively to shocks caused or experienced by Islamic bank financing (Hasan et al., 2021 and Tamanni, 2021). The results of the CPI Impulse Responses on Islamic bank deposits also show a positive response of the CPI to shocks experienced by Islamic bank deposits. This indicates that any increase that occurs in sharia bank deposits will be followed by an increase in the CPI. The results of this study are in line with previous research studies stating that inflation responds positively to any changes experienced by Islamic bank deposits (e.g., Karima, 2018 and Tamanni's 2021).

The CPI Impulse Response Function showed a negative response of the CPI to SBIS's shock, as shown in previous research (Sudarsono's 2017; Katmas's 2022; Hasan et al., 2021; Kaminska's et al. 2021; Priskila's & Nurhasanah, 2021; Koeniger's et al. 2022; and Hamza's & Saadaoui, 2018). This indicates that any

increase in the SBIS will cause a CPI reduction. The results of the IHK to PUAS showed a positive response of CPI to PUAS's shock. Previous research studies have reported similar results (Karima, 2018; Lakdawala's et al., 2021; and Bawono's et al., 2021) indicating that any increase in PUAS will be followed by an increase in the CPI.

The results of the Impulse Response Function test on sharia instruments and the conventional instrument indicators provided different responses. The Impulse Response Function showed a negative response of the CPI to shock caused by conventional bank credit, a result supported by other studies (i.e., Sudarsono, 2017).

Then the results of the CPI Impulse Response Function test on conventional bank deposits showed a negative response of the CPI to the shock of conventional bank deposits. This indicates that any increase in conventional bank deposits will cause a CPI reduction. The results of the IHK test for SBIs show a negative response of CPI to changes in SBIs. The results of this study are in line with the findings of Madani & Widiastuti, (2021), which show that the CPI responds negatively to the shocks experienced by the SBI. This indicates that any increase in the SBI will cause a decrease in the CPI. Meanwhile, the Impulse Response Function showed a positive response of CPI to the shock of PUAB. This indicates that any increase that occurs in the PUAB will be followed by an increase in the CPI.

The influence of the monetary policy transmission through sharia and conventional instruments on inflation can be measured with assumptions based on the magnitude of the influence of indicators from sharia and conventional instrument variables, as shown by the results of the variance decomposition test. The results of the variance decomposition test show that indicators from sharia instruments simultaneously affected the CPI in the short term by 0.76%, in the medium term by 1.09%, and in the long term by 1.10%. Meanwhile, indicators from conventional instruments simultaneously affected the CPI in the short, middle, and long terms by 0.88%, 1.05%, and 1.05%, respectively.

These results indicate that the influence of Islamic instrument indicators on the CPI is greater than that of conventional instrument indicators, especially for the mid and long terms. This is in line with monetary theory, which states that monetary policy instruments require a sufficiently long-time lag until the inflation goal is achieved. Therefore, the effects of monetary policy instruments on inflation are perceived in middle to long term time frames. Accordingly, and based on the

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results of the variance decomposition test, it can be concluded that the transmission of Islamic monetary policy is more effective in influencing inflation in Indonesia.

E. CONCLUSION

The results of the Impulse Response Function tests conducted with indicators of Islamic instrument variables show a negative response of the CPI to the shock or to the shock that occurs in the indicators of Islamic Bank Financing and SBIS. This indicates that any increase that occurs in Islamic Bank Financing and SBIS will cause the inflation rate (as proxied by CPI) to decrease.

Meanwhile, the CPI showed a positive response to the shocks that occurred in the PUAS and DPK indicators, indicating that increases in PUAS and TPF will be followed by an increased inflation rate. The results of the Impulse Response Function test on conventional instrument indicators show a negative response of the CPI to shocks or shocks that occur in conventional bank credit indicators (LOAN), TPF, and SBI. This indicates that any increase in conventional bank credit (LOAN), TPF, and SBI will reduce the inflation rate, given that the CPI shows a positive response.

The results of the Variance Decomposition test show that the influence of the sharia instrument variables on the inflation is greater than that of conventional instrument indicators. This shows that the transmission of monetary policy through sharia instruments is more effective in influencing inflation in Indonesia from 2016 to 2020 than the conventional instrument indicators.

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Ishak[1], Nur Ariani Aqidah[2], Mikdar Rusydi[3]