

Can Sukuk Support Sustainable Development through Monetary Policy Transmission?

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Abstract—Currently, the Islamic financial sector has become a global concern because it has potential in the development of a country. One of the products in this sector in the Islamic capital market is *Sukuk*. The purpose of this study is to analyze the influence of *Sukuk* on inflation and economic growth in Indonesia through monetary policy transmission. The analytical method used is a cointegration approach to analyze the relationship between the balance of sukuk, inflation and economic growth in the short and long term. The research variables used are the monetary transmission of asset price channel, namely *Sukuk*, consumption, inflation, interest rate, economic growth, and the composite stock price index. The results showed that in the short term, *Sukuk* does not have a balance relationship and influence on inflation, but sukuk has a balance and influence relationship on economic growth and composite stock price index through the channel of asset prices. This indicates that it is important for the relevant Indonesian authorities to improve the development of the Islamic capital market especially *Sukuk* to support sustainable development, because capital financing for companies and financing of fiscal deficits for the government can be obtained from its own population, accordingly that Indonesia's dependence on foreign debt can be reduced and the development process continues.

Keywords— Sukuk; Monetary Policy Transmission; Inflation; Economic Growth

I. INTRODUCTION

The increase in investment in the economy shows that many parties are over-funded and lend money to issuers (those who need funds) for their production activities. The more issuers who get funding, the more processes of economic activity can be carried out such as infrastructure development that requires a very large investment and will take a very long time. The increasing process of economic activity will increase the production of goods and services nationally (national output). Therefore, that it can increase economic growth.

In this study, the measure used for economic growth is gross domestic product (GDP) according to the business field. The development of the amount of GDP for the period 2010-2016 exposed in Figure 1, that economic growth in Indonesia is getting better every year as evidenced by the increase in data every year although it fluctuates slightly. The importance of examining economic growth variables associated with *Sukuk*, Echchabi (2016) explains that the results of his research indicate that *Sukuk* issuance affects GDP and Gross Capital Formation (GCF) in all countries and there is no effect on Saudi Arabia and the Gulf Cooperation Council (GCC).

In theory, aggregate demand has a relation to price and the number of goods and services requested or output (Mankiw, 2007, p. 256). If prices continue to increase, it will cause inflation. Inflation conditions are not always becomes a problem for a country's economy. The expected inflation in the economy is inflation that can be controlled at the level of tolerance according to the target set by the central bank. Hence that the economy is not sluggish, production activities can still be active. The development of inflation in Indonesia for the period 2010-2016. Figure I, shows the price level is in the category of tolerance level because it is still below 2 digits. If we look at the data from the GDP growth rate and inflation, it is shown that in the same period, 2010-2016 the conditions between GDP and price (inflation) levels were the opposite. In other words, if inflation increases then economic growth decreases and vice versa if the inflation rate decreases then in the same period also shows the pattern of increasing GDP growth. This indicates that inflation has a relationship with economic growth. When viewed from the perspective of community income, if there is inflation, people's purchasing power will decrease because real income decreases. For people who have small and fixed income, this condition will affect the reduced consumption of the community, consequently that the aggregate demand for the production of goods and services decreases.

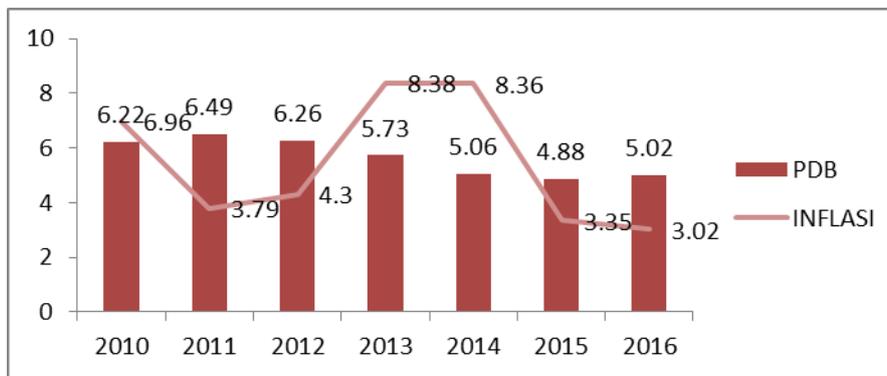


FIGURE 1. GDP AND INFLATION GROWTH RATE

The Indonesian government uses *Sukuk* as one of the instruments for financing fiscal deficits, in this case, the sovereign *Sukuk*. The government places the sovereign *Sukuk* as a financing instrument for the state expenditure budget (APBN) and Indonesian banks use it as a liquidation tool. *Sukuk* has two functions, so *Sukuk* has opportunities and potential to become an effective instrument of monetary-fiscal policy (mix-policy) in the future in Indonesia. However, the players in Islamic finance activities are still lacking, especially Muslims in Indonesia. This is supported by the results of Fatah's research (2011); investors who buy *Sukuk* on the primary market are dominated by conventional financial institutions.

The mix-policy becomes important if it is reviewed, one of which is that in determining fiscal policy in the state budget, an inflation target is set by the Central Bank. Thus, that an instrument is needed that mutually supports the two policies. Saragih (2015) concludes the results of his research analysis that in achieving the inflation target and economic growth, the monetary-fiscal policy is just as important through the application of a mixed policy that must be synchronized not to weaken each other. According to Warjiyo and Solikin (2003), mix-policy can be done with several scenarios, namely; (1) Expansive monetary policy and Expansive fiscal policy; (2) contractive monetary policy and expansionary fiscal policy; (3) Expansive monetary policy and contractive fiscal policy; (4) contractive monetary policy and contractive fiscal policy.

The implementation of monetary policy has been widely explained by economists, including Mishkin (1988) in a symposium explaining that there are four channels of the transmission mechanism for monetary policy. This theory is very well known and is the basic foundation for developing monetary policy mechanisms in countries. Rasiah (2013) in her book explains the monetary transmission channel, which is the channel price of assets and credit. Derivatives of asset price channels are interest rate channels, exchange rates, and equity price channels. Meanwhile, derivatives from the credit channel explain the existence of the functions of the Bank Lending and Balance Sheet channels.

One of the mechanisms for monetary transmission according to Rasiah (2013) is through an equity price channel in which there are two channels, namely Tobin's Q-theory investment and wealth effect on consumption. The ultimate goal of monetary policy shown in Figure 2 is to influence economic growth and prices. This is consistent with Taylor's (1995) article which explains that the mechanism of monetary policy transmission is the process of making monetary policy decisions transmitted into changes in real GDP and inflation. Therefore, a complex process is needed through several channels of transmission of monetary policy with various instruments used to produce decisions that are relatively safe for all sides of the economy in policy making.

The transmission mechanism of monetary policy in Indonesia consists of several channels that are used to achieve macro objectives, namely price stability. The main pathway of the current monetary policy transmission mechanism is the previous BI 7DRR (Bank Indonesia 7 Days Reserve Repo), namely SBI (Bank Indonesia Certificate) and BI-rate (Bank Indonesia-rate). Then the other five channels are the deposit and credit interest rates, credit channels, asset price channels. exchange rate channel and inflation expectation channel.

Monetary policy cannot stand alone, however, must pay attention to the development of science and the demands of increasingly complex economic management. Monetary and fiscal policies are macro policies that have the same ultimate goal. Therefore monetary and fiscal policies must go hand in hand and support each other's direction from policies to achieve a stable economy. The importance of the study of this policy mix according to Adiningsih (2012) is the need for coordination between fiscal and monetary policies in facing the challenges ahead of macro policy in Indonesia. The coordination includes efforts to find the optimal meeting point of policy stance and efforts to find the right configuration of the instruments used in each policy. This has become one of the motivations in writing this study to examine the monetary-fiscal mix policy through the influence of *sukuk* as a sharia hedging on inflation and economic growth through the transmission mechanism of monetary

policy in Indonesia. Also supported by the results of Djennas's research (2016), which states that Islamic finance is stronger in its position in dealing with various situations that vary with the crisis.

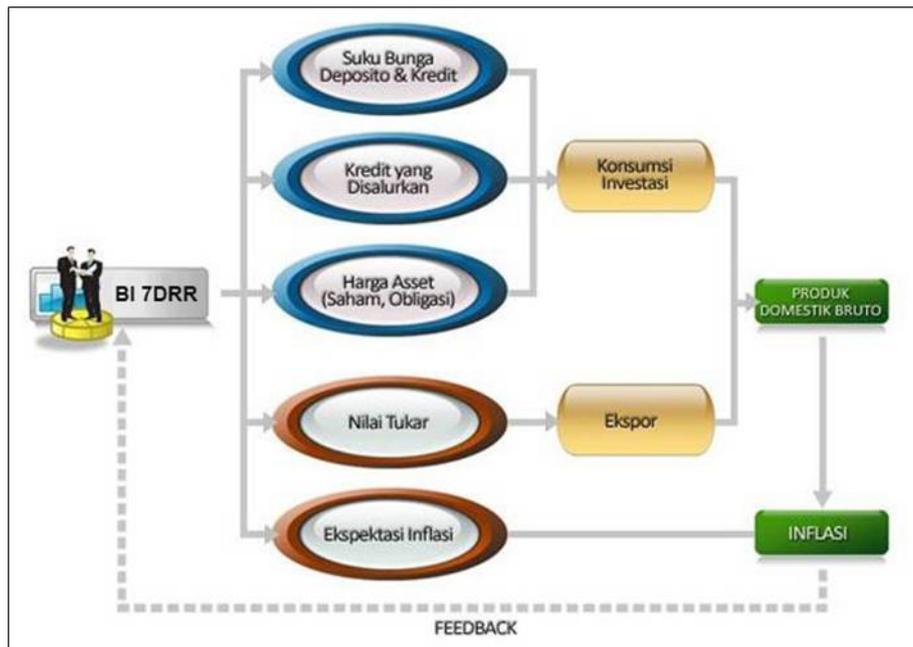


FIGURE II. MECHANISM OF MONETARY POLICY TRANSMISSION IN INDONESIA

This study examines the relationship among *Sukuk* to inflation and economic growth through the monetary policy transmission mechanism. Similar to the research Yusof and Majid (2007) also analyzed the transmission of monetary policy but the relationship with stock market volatility in Malaysia by comparing the Islamic stock market and conventional stock markets. Then Haryanto (2007) discusses the influence of monetary policy instruments on the economy in Indonesia. Similar to Fauziah (2015), which compares mechanism of monetary policy transmission by using conventional instruments (SBI, M2, and conventional bonds) and sharia instruments (SBIS, M2, and sovereign sukuk) and analyzing its effects on inflation. Likewise, several previous studies that examine sovereign sukuk only (Nasrullah et al., 2013), the liquidity and prices of sovereign *Sukuk* by Nurhasanah (2011), *Mudharabah* bonds as sharia bonds by Akbarullah (2011) and Sugianto (2015) also examine Islamic bonds by using a Bank Indonesia Sharia certificate (SBIS) as a sharia monetary instrument.

From some previous research studies, it can be concluded that the novelty of this study is to use the total *Sukuk* variables (accumulation of corporate *Sukuk* and sovereign *Sukuk*). The aim of this study is to investigate whether sukuk can support sustainable development in Indonesia by analyzing the influence of *Sukuk* on inflation and economic growth through the monetary policy transmission mechanism. This study focuses on just one channel, namely the asset price channel with consideration of *Sukuk* is a sharia bond product that has underlying assets. *Sukuk* has potential as alternative financing instruments in the real sector through investment activities. The content stage in this paper after the introduction is a literature review, the research method, results and discussion and finally the conclusion.

II. LITERATURE REVIEW

Monetary policy is an action taken by the central bank to influence the macroeconomic situation through the money market. Hamza and Saadaoui (2017) describe that the relationship between monetary policy and the real economy is identified through the influence of the monetary transmission channel on macroeconomic variables, especially economic growth, inflation, and investment. Monetary economists such as Mishkin (1995) with the explanation of black box and Taylor (2002) with the evaluation of monetary policy rules have a common view that explains that monetary policy influences aggregate output (Y) in terms of macroeconomics. Then Walsh (2010, p. 34) in his book entitled monetary theory and policy, explains that monetary policy can influence the real sector with money in the utility function, namely by using measurements from the microeconomic side.

Mishkin's analysis (1995), the transmission mechanism of monetary policy is a complex process and calls it a "black box". Bernanke and Gertler (1995), also added a "black box" analysis for credit channels consisting of several other channels. The

complex process in monetary transmission is influenced by the behavior of the central bank, banking, and economic agents. Then it is also affected by the length of time taken until the monetary policy target is achieved and is influenced by the monetary transmission channels due to economic and financial developments in a country.

The monetary policy process works through several channels. There are six channels of monetary transmission according to Warjiyo et al. (2003) namely monetary aggregate (money) channel, interest rate channel, asset price channel, exchange rate channel, credit, and inflation expectations channel. Meanwhile, according to Mishkin (1995) in the symposium and further explanation by Mishkin (1996) for each monetary policy channel, namely the channel of interest rate, exchange rate, and asset and credit price. Majid and Hasin's research (2014), examines the effect of several monetary policy channels on the economy through Islamic banking (a case in Malaysia). The channel being studied is 4 channels; interest rate, bank lending, asset price, and exchange rate. Then Sun (2010) compared the transmission of monetary policy with the Vector Auto Regression Model (VAR) approach with monetary instruments. Nevertheless, in this paper, only one channel will be analyzed, namely the asset price channels.

In other asset price effects (Mishkin, 1995), monetary experts reject the Keynes paradigm to analyze the effects of monetary policy in the economy by focusing on one asset price relative to the interest rate or in the case of Taylor's model. Monetary groups assume that it is also important to pay attention to the prices of other relative assets and real wealth. In addition to bond prices, the two other asset prices referred to are exchange rates and equity. The asset price channel also involves the influence of interest rates. If domestic real interest rates fall, domestic assets in dollars become low in value due to foreign currency denominations. In addition, it is supported by Tobin's q Theory explains how monetary policy can affect the economy through the influence of equity valuations.

The relationship between Tobin's theory and investment expenditure from the monetary policy channel process is through consumption activities. If the monetary authority conducts monetary expansion, then the purchasing power of the people becomes high marked by increased income. One place to channel public consumption activities is the capital market, which increases the demand for equity, thereby increasing equity prices. The price increase will cause a rise in q , consequently encouraging higher investment spending and finally increasing the amount of national output. the process of linking this theory according to Mishkin (1996) can be seen in Scheme (1):

$$M \rightleftarrows P_e \rightleftarrows q \uparrow \rightleftarrows I \uparrow \rightleftarrows Y \uparrow$$

(1)

Asset price movements according to Goeltom (2007), have some information about economic conditions and also the movement of inflation in the future. The asset value channel (asset price channel) can explain how monetary policy impacts through changes in SBI interest rates (Bank Indonesia Certificates) on changes in investment decisions. If BI increases SBI interest rates, deposit rates will increase and people prefer to save their money with commercial banks. In other words, the increase in SBI interest rates shows high investment costs so as not to encourage investment. Conversely, a decrease in SBI interest rates will encourage investment. Alavi (2016) uses the IS-MP-US Model to analyze the efficiency of monetary and fiscal policies in the Iranian economy. The results of his research show that monetary policy is very effective and affects the economy (GDP).

Cui (2016) examines the monetary-fiscal policy (mix policy) with liquidity friction, concluding that the right monetary mix policy can avoid a deep financial recession. This is explained by the problem of shifting liquidity occurring on the monetary side, thus that an expansionary fiscal by increasing debt becomes the best solution. Because high government debt will increase the liquidity of the entrepreneur's portfolio and increase investment.

The optimal policy responds to liquidity traps as liquidity problems in extreme monetary cases, reinforced by previous research from Burgert and Schmidt (2014), which states that optimal policies responding to liquidity traps depend on existing debt. When fiscal expansion begins to decline with outstanding levels of government debt, an expansionary monetary policy in the future becomes more accommodating, triggering changes in expectations in the private sector to reduce the decline in output and inflation during the onset of the liquidity trap.

The impact of *Sukuk* market development on economic growth was also examined by Smaoui and Nechi (2017) which used a sample consisting of all *Sukuk* issuing countries covering the period 1995–2015. The model used is the GMM (Generalized Method of Moments) system estimator to overcome the potential problems of the bias, endogeneity, and simultaneity variables that are eliminated. The results provide strong evidence that the *Sukuk* market development is conducive to economic growth, even after controlling various measures of financial market development, institutional quality, and classical determinants of economic growth. It was concluded that the development of the *Sukuk* market had promoted financial inclusion by eliminating the negative effects of religious exclusion, which stimulated investment and economic growth.

By comparing this study with the previous one, there are some several differences between this research and previous research. This study has specificity, namely the analysis of *Sukuk* variables from the total *Sukuk* issued in Indonesia, both

corporate *Sukuk* and sovereign *Sukuk*. This paper discusses *sukuk* and its relation to sustainable development processes through monetary policy transmission by looking at macroeconomic variables, namely inflation and economic growth. In contrast to the research conducted by Igan (2016), analyzing how the shock of monetary policy to the balance sheet in the United States. In contrast to Husman's (2015) study, this analyzed the influence of Islamic banking on the transmission of monetary policy, cases in Indonesia. Study of the transmission mechanism of monetary policy in Indonesia through the sharia monetary system by Sugianto et al. (2015). This study examines the relationship between sharia monetary instruments namely the Sharia Interbank Money Market (PUAS), Bank Indonesia Sharia Certificates (SBIS) and financing with inflation.

III. METHOD

A. Research Methodology

This study analyzes the effect of *sukuk* on inflation and economic growth through a monetary policy transmission channel in the asset price channel. More specifically, it can be said that this study is an analysis of the evaluation of the contribution of *Sukuk* to the macro economy in Indonesia through the mechanism of transmission of monetary policy. If the macro economy is stable and better, there will be a sustainable development process. The period used in this study is 2003-2017. The transmission mechanism of monetary policy in this study is the asset price channel.

The research variables analyzed in this modeling include the total value of *Sukuk* (S), namely the total volume of *sukuk* from the issued corporate and sovereign *Sukuk*, Composite Stock Price Index (CSPI), Cons (total consumption) of household and government consumption, inflation rate (INF) namely the calculation of inflation based on the consumer price index, the interest rate of Bank Indonesia policy (BIr), and Gross Domestic Production (GDP). Several test stages carried out in this study are data stationary test, model stability test, lag optimal test, cointegration test and then just selecting the right analysis model.

The analytical approach used is cointegration to answer the objectives of the first research, namely to analyze the balance of *Sukuk* relations with inflation and economic growth in the short and long term through the channel of asset prices and exchange rates. Then the selection of the model for this cointegration approach is VAR/VECM.

Previous research using cointegration approach is Majid (2016). His research uses cointegration models, error correction models (ECM) and decomposition variants to examine short-term and long-term relationships on Islamic stock returns in Indonesia. Majdoub et al. (2016), using a cointegration model to analyze conventional stock prices and Islamic stocks.

The next model to answer the purpose of the second research is the Ordinary Least Square (OLS) model. The reason for choosing regression with OLS or ordinary least squares method is because the simple estimation method used in the VAR/VECM model is OLS which can be made in a separate equation and OLS estimator in multiple regression is the best linear bias estimator (BLUE). Hence, that each regression coefficient estimated is linear and unbiased, the average for the estimated coefficient is exactly the same as the actual value. OLS estimators are efficient (Gujarati and Porter, 2009, p. 101).

Previous research using the OLS or least square method model for linear regression is Akbarullah (2011) which examines the impact of *Sukuk* issuance on Sharia Bank performance. The regression used is the simple linear regression for each equation and the classical assumption test that is tested is autocorrelation and heteroscedasticity. The existence of a development process in a country is used as an important indicator in the macro economy. Kim et al. (2018) explained the results of his research by using the VAR panel model, IRFs and the Granger Causality test panel that financial inclusion positively affected economic growth in the OIC (Organization of Islamic Cooperation) country.

B. Model Analysis

In the concept of cointegration, two or more time station variables are not stationary will be cointegrated if the combination is also linear over time, although each variable can be non-stationary. If the time series variable is cointegrated there is a stable relationship, in the long run, if two series are not stationary consisting of X_t and Y_t are cointegrated, then there are special representations as follows (2);

$$y_t = a + b x_t + \varepsilon_t \quad (2)$$

The linear relationship between Y_t and X_t is called an attractor (the variable that is considered) and cointegration regression. To find out the stationary or non-stationary time series regression can be used. According to Granger's Representation Theorem, cointegration is included in the ECM model, which means that if $x_t \sim I(1)$, $y_t \sim I(1)$, $\varepsilon_t \sim I(0)$, the ECM equation can be written as in Equation (3) as follows :

$$\Delta y_t = \alpha + \sum_{i=1}^k \beta_i \Delta y_{t-i} + \sum_{i=0}^k \gamma_i \Delta x_{t-i} + \phi \varepsilon_{t-1} + \varphi t \quad (3)$$

Starting $\phi < 0$ must have a negative value or a valid ECM must be negative and statistically significant. This means that the cointegration that occurs is convergent. The ECM model is used to further analyze the results of cointegration tests in long-term equilibrium. According to Gujarati and Porter (2009), Error Correction Model (ECM) is consistent with the cointegration concept, hereinafter referred to as Granger Representation Theorem.

The cointegration used in this study is the cointegration test developed by Johansen. The Johansen test uses trace statistical analysis greater than the critical value at $\alpha = 5$ percent confidence level or probability value (p-value) smaller than $\alpha = 5$ percent, indicating cointegration. If the non-stationary variable is at the level but has the potential to be cointegrated, the VECM Model is used with the Error Correction Model (ECM) approach. Referring to Equations (4) and transformations to Equations (5 - 10), hypotheses can be built on cointegration tests and testing hypotheses as follows: $H_0: \phi_1 = \phi_2 = \phi_3 = \phi_4 = \phi_5 = \phi_6 = 0$ (no cointegration) and $H_1: \phi_1 \neq \phi_2 \neq \phi_3 \neq \phi_4 \neq \phi_5 \neq \phi_6 \neq 0$ (there is cointegration). Test criteria with F statistic on Wald test are H_0 is accepted if the value of $F_{\text{statistic}} < F_{\alpha, n-k}$ or if the p-value is greater than the significance level determined 1 - 10 percent. H_0 is rejected if the value of $F_{\text{statistic}} > F_{\alpha, n-k}$ or if p-value is smaller than the level of significance specified 1 - 10 percent.

$$\Delta Y_t = \mu_i + \sum_{i=1}^n A_i \Delta Y_{t-1} + \varepsilon_t \quad (4)$$

Starting Y is the shape of the vector ($n \times 1$). A is a parameter, Δ is the difference in operator and ε_t is an error term. The VAR model does not have the ability to analyze long-term phenomena. If Equation (4) is transformed into the function of the equation in this research variable through the channel of asset prices and the exchange rate for the VAR Model. Then the general form of this research regression equation for the VAR model with lag 1 as follows:

$$CSPI_t = \alpha_1 + \beta_{1i} \sum CSPI_{t-i} + \beta_{1i} \sum BIR_{t-i} + \beta_{1i} \sum Cons_{t-i} + \beta_{1i} \sum INF_{t-i} + \beta_{1i} \sum Sukuk_{t-i} + \beta_{1i} \sum GDP_{t-i} + \varepsilon_t \quad (5)$$

$$BIR_t = \alpha_1 + \beta_{2i} \sum BIR_{t-i} + \beta_{2i} \sum CSPI_{t-i} + \beta_{2i} \sum Cons_{t-i} + \beta_{2i} \sum INF_{t-i} + \beta_{2i} \sum Sukuk_{t-i} + \beta_{2i} \sum GDP_{t-i} + \varepsilon_t \quad (6)$$

$$Cons_t = \alpha_1 + \beta_{3i} \sum Cons_{t-i} + \beta_{3i} \sum CSPI_{t-i} + \beta_{3i} \sum BIR_{t-i} + \beta_{3i} \sum INF_{t-i} + \beta_{3i} \sum Sukuk_{t-i} + \beta_{3i} \sum GDP_{t-i} + \varepsilon_t \quad (7)$$

$$INF_t = \alpha_1 + \beta_{4i} \sum INF_{t-i} + \beta_{4i} \sum CSPI_{t-i} + \beta_{4i} \sum BIR_{t-i} + \beta_{4i} \sum Cons_{t-i} + \beta_{4i} \sum Sukuk_{t-i} + \beta_{4i} \sum GDP_{t-i} + \varepsilon_t \quad (8)$$

$$Sukuk_t = \alpha_1 + \beta_{5i} \sum Sukuk_{t-i} + \beta_{5i} \sum CSPI_{t-i} + \beta_{5i} \sum BIR_{t-i} + \beta_{5i} \sum Cons_{t-i} + \beta_{5i} \sum INF_{t-i} + \beta_{5i} \sum GDP_{t-i} + \varepsilon_t \quad (9)$$

$$GDP_t = \alpha_1 + \beta_{6i} \sum GDP_{t-i} + \beta_{6i} \sum CSPI_{t-i} + \beta_{6i} \sum BIR_{t-i} + \beta_{6i} \sum Cons_{t-i} + \beta_{6i} \sum INF_{t-i} + \beta_{6i} \sum Sukuk_{t-i} + \varepsilon_t \quad (10)$$

Where *Sukuk* is the total *Sukuk*, CSPI is the Composite Stock Price Index, INF is the inflation rate, BIR is the interest rate of the central bank (Bank Indonesia), Cons is consumption, and GDP is economic growth. The function of Equation (5)-(10) to analyze the short-term and long-term balance relations of *Sukuk* in the mechanism of transmission of monetary policy through the asset price channel. The variables used in this equation function to be estimated through asset price channel, namely the total *Sukuk*, interest rates, consumption, CSPI, inflation and economic growth.

If the unit roots test results show that there is cointegration, the model used is the VECM model. The excess of using the VECM model is having the ability to analyze short-term and long-term phenomena as well as reviewing the consistency of empirical models with economic theory and being one of the solutions to time-stationary problems that are not stationary in econometric analysis. The VECM Model Equation is written as in Equation (11) by including the ECT value in the regression equation as follows:

$$\Delta Y_t = \mu_i + \sum_{i=1}^n A_i \Delta Y_{t-1} + \sum_{i=1}^n \lambda \theta_{t-1} + v_t \quad (11)$$

Equation (11) describes VECM modeling which has similarities with VAR modeling, starting from Y is the shape of the vector ($n \times 1$). A and λ are the parameters used, Δ is the difference in operator and ϵ_t is the error term. The difference is that there is Θ which is the ECT (error correction term) value. The value of ECT must be negative, meaning that the regression results of the equation have a long-term balance and if the probability value is significant at 1-10 percent, then the equation is declared to be convergent.

The model used in this study cannot be determined using VAR or VECM models because data stationarity and cointegration tests have not been tested. Therefore modeling is written back into the form of a regression equation for the VECM Model through the asset price channel and the exchange rate which refers to Equation (11) so as to produce several regression equations as follows:

$$HCSPI_t = \alpha_1 + \beta_{1i} \sum CSPI_{t-i} + \beta_{1i} \sum BIR_{t-i} + \beta_{1i} \sum Cons_{t-i} + \beta_{1i} \sum INF_{t-i} + \beta_{1i} \sum Sukuk_{t-i} + \beta_{1i} \sum GDP_{t-i} + \Theta_{1it-i} + \epsilon_t \tag{12}$$

$$BIR_t = \alpha_1 + \beta_{2i} \sum BIR_{t-i} + \beta_{2i} \sum CSPI_{t-i} + \beta_{2i} \sum Cons_{t-i} + \beta_{2i} \sum INF_{t-i} + \beta_{2i} \sum Sukuk_{t-i} + \beta_{2i} \sum GDP_{t-i} + \Theta_{2it-i} + \epsilon_t \tag{13}$$

$$Cons_t = \alpha_1 + \beta_{3i} \sum Cons_{t-i} + \beta_{3i} \sum CSPI_{t-i} + \beta_{3i} \sum BIR_{t-i} + \beta_{3i} \sum INF_{t-i} + \beta_{3i} \sum Sukuk_{t-i} + \beta_{3i} \sum GDP_{t-i} + \Theta_{3it-i} + \epsilon_t \tag{14}$$

$$INF_t = \alpha_1 + \beta_{4i} \sum INF_{t-i} + \beta_{4i} \sum CSPI_{t-i} + \beta_{4i} \sum BIR_{t-i} + \beta_{4i} \sum Cons_{t-i} + \beta_{4i} \sum Sukuk_{t-i} + \beta_{4i} \sum GDP_{t-i} + \Theta_{4it-i} + \epsilon_t \tag{15}$$

$$Sukuk_t = \alpha_1 + \beta_{5i} \sum Sukuk_{t-i} + \beta_{5i} \sum CSPI_{t-i} + \beta_{5i} \sum BIR_{t-i} + \beta_{5i} \sum Cons_{t-i} + \beta_{5i} \sum INF_{t-i} + \beta_{5i} \sum GDP_{t-i} + \Theta_{5it-i} + \epsilon_t \tag{16}$$

$$GDP_t = \alpha_1 + \beta_{6i} \sum GDP_{t-i} + \beta_{6i} \sum CSPI_{t-i} + \beta_{6i} \sum BIR_{t-i} + \beta_{6i} \sum Cons_{t-i} + \beta_{6i} \sum INF_{t-i} + \beta_{6i} \sum Sukuk_{t-i} + \Theta_{6it-i} + \epsilon_t \tag{17}$$

OLS estimation that will be explained is in accordance with the research objectives, namely for the dependent variable inflation regression and economic growth in the asset price channel and the dependent variable of the monetary sector so that it can represent the process of influence that occurs through the monetary policy transmission mechanism. Then it can be written the function of multiple regression equations for asset price channel in VAR and VECM as follows;

$$INF_t = \alpha_1 + \beta_{4i} \sum INF_{t-i} + \beta_{4i} \sum CSPI_{t-i} + \beta_{4i} \sum BIR_{t-i} + \beta_{4i} \sum Cons_{t-i} + \beta_{4i} \sum Sukuk_{t-i} + \beta_{4i} \sum GDP_{t-i} + \epsilon_t \tag{18}$$

or

$$INF_t = \alpha_1 + \beta_{4i} \sum INF_{t-i} + \beta_{4i} \sum CSPI_{t-i} + \beta_{4i} \sum BIR_{t-i} + \beta_{4i} \sum Cons_{t-i} + \beta_{4i} \sum Sukuk_{t-i} + \beta_{4i} \sum GDP_{t-i} + \Theta_{4it-i} + \epsilon_t \tag{19}$$

$$GDP_t = \alpha_1 + \beta_{6i} \sum GDP_{t-i} + \beta_{6i} \sum CSPI_{t-i} + \beta_{6i} \sum BIR_{t-i} + \beta_{6i} \sum Cons_{t-i} + \beta_{6i} \sum INF_{t-i} + \beta_{6i} \sum Sukuk_{t-i} + \epsilon_t \tag{20}$$

or

$$GDP_t = \alpha_1 + \beta_{6i} \sum GDP_{t-i} + \beta_{6i} \sum CSPI_{t-i} + \beta_{6i} \sum BIR_{t-i} + \beta_{6i} \sum Cons_{t-i} + \beta_{6i} \sum INF_{t-i} + \beta_{6i} \sum Sukuk_{t-i} + \Theta_{6it-i} + \epsilon_t \tag{21}$$

$$CSPI_t = \alpha_1 + \beta_{1i} \sum CSPI_{t-i} + \beta_{1i} \sum BIR_{t-i} + \beta_{1i} \sum Cons_{t-i} + \beta_{1i} \sum INF_{t-i} + \beta_{1i} \sum Sukuk_{t-i} + \beta_{1i} \sum GDP_{t-i} + \epsilon_t \tag{22}$$

or

$$CSPI_t = \alpha_1 + \beta_{1i} \sum CSPI_{t-i} + \beta_{1i} \sum BIR_{t-i} + \beta_{1i} \sum Cons_{t-i} + \beta_{1i} \sum INF_{t-i} + \beta_{1i} \sum Sukuk_{t-i} + \beta_{1i} \sum GDP_{t-i} + \theta_{1it-i} + \varepsilon_t \tag{23}$$

$$BIR_t = \alpha_1 + \beta_{2i} \sum BIR_{t-i} + \beta_{2i} \sum IHSG_{t-i} + \beta_{2i} \sum Cons_{t-i} + \beta_{2i} \sum INF_{t-i} + \beta_{2i} \sum Sukuk_{t-i} + \beta_{2i} \sum PDB_{t-i} + \varepsilon_t \tag{24}$$

or

$$BIR_t = \alpha_1 + \beta_{2i} \sum BIR_{t-i} + \beta_{2i} \sum IHSG_{t-i} + \beta_{2i} \sum Cons_{t-i} + \beta_{2i} \sum INF_{t-i} + \beta_{2i} \sum Sukuk_{t-i} + \beta_{2i} \sum PDB_{t-i} + \theta_{2it-i} + \varepsilon_t \tag{25}$$

IV. FINDING AND DISCUSSION

Results analysis can be seen from several test results that have been carried out. Every time series data requires the testing of data stationarity. The unit price tests used in asset price channels are shown in Table I and Table II for the exchange rate channel, use the ADF, PP and KPSS tests. The test is conducted at the level or I (0) will be continued to first difference or I (1) if the level is not stationary. The type of equation estimation in this test is the trend and intercept.

Based on the test results in Table I show all stationary variables in the first difference data. Hence, this data can be used for the next test. The result of the stability model test known that model is stable and the lag optimal is 3. At that point, a cointegration test is performed as shown in Table II which shows that the data is cointegrated at 0.05 percent. Therefore, the chosen model is the VECM. Equilibrium relationship analysis on asset price channel can be seen from the coefficient value of ordinary least square regression results for linear multiple regression in the VECM model as shown in Table III.

Regression results that are considered are the sukuk variable coefficient (DLSukuk) on inflation (DInf) and Sukuk (DLSukuk) on economic growth (DLGDP) and (DLSukuk) on variables in the monetary sector (DBIr and DCSPi). The dependent variable is the variable inflation, economic growth, policy interest rates, and the composite stock price index.

TABLE I. UNIT ROOT TEST RESULTS

Variables	ADF (t-stat)		PP (t-stat)		KPSS (LM test)	
	I(0)	I(1)	I(0)	I(1)	I(0)	I(1)
CSPI	-2.9349	-11.4741***	-2.5276	-11.3854***	4.7840	0.0652***
INF	-2.8718	-6.2623***	-2.5653	-11.0737***	3.4858	0.1047***
LCONS	-1.1809	-3.0722	-1.2726	-7.1432***	0.2075	0.0997***
LGDP	-2.0774	-5.2343***	-2.2662	-6.8692***	3.2421	0.0867***
LSUKUK	-1.4846	11.5037***	-1.5137	-14.2676***	0.7352	0.0930***
BIR	2.9147	-7.0100***	-3.0723	-6.0834***	0.4862	0.0579***

Note: Significance ***(1%), **(5%), *(10%)

TABLE II. JOHANSEN CO-INTEGRATION TEST

Null Hypotheses	T-Statistic		Critical Value	
	Trace	Max-Eigen	Trace	Max-Eigen
$r = 0^*$	243.1813	71.2596	95.7537	40.0776
$r \leq 1^*$	171.9218	51.0166	69.8189	33.8769
$r \leq 2^*$	120.9051	39.4275	47.8561	27.5843
$r \leq 3^*$	81.4776	35.0099	29.7971	21.1316
$r \leq 4^*$	46.4677	24.6619	15.4947	14.2646
$r \leq 5^*$	21.8057	21.8057	3.8415	3.8415

Note: Sign * i is cointegration at the 0,05%.

Regression results that are considered are the *Sukuk* variable coefficient (DLSukuk) on inflation (DInf) and *sukuk* (DLSukuk) on economic growth (DLGDP) and (DLSukuk) on variables in the monetary sector (DBIr and DCSPi). The dependent variable is the variable inflation, economic growth, policy interest rates and the composite stock price index.

Coefficient value is used to explain the short-term balance relationship. Meanwhile, to see the balance relationship in the long run, by observing the error correction term value (ECTLSukuk) in the *Sukuk* equation regression. From Table III, it is obtained information that the relationship between *Sukuk* and inflation in the short-run equilibrium is shown by a positive coefficient value for the future of 2.6984 and 3 previous periods (0.9416; 2.0616 and 1.5598). The probability value of the value or P-value explains that the value of α exceeds 10 percent. So it can be concluded that the balance between *Sukuk* and inflation in the asset price channel is positive but not significant. It can be said explicitly that *Sukuk* does not have a balance with inflation.

Then the coefficient in the short-term balance in the future has a positive value of 0.3630 and one previous period with a positive and significant coefficient of 0.1252. In the second period, it was positive at 0.0235 but not significant. While the third period shows a negative balance relationship of -0.0396 and not significant. It can be said that *Sukuk* has a positive balance relationship with economic growth.

TABLE III. RELATIONSHIP AMONG SUKUK BALANCE, INFLATION AND ECONOMIC GROWTH

<i>Dependent variables</i>	<i>Coefficient of Independent variables</i>			
	<i>DLSukuk</i>	<i>DLSukuk(-1)</i>	<i>DLSukuk(-2)</i>	<i>DLSukuk(-3)</i>
Dinf	2.6984 (0.1208)	0.9416 (0.5906)	2.0616 (0.2304)	1.5598 (0.2772)
DLGDP	0.3630*** (0.0000)	0.1252*** (0.0001)	0.0235 (0.4670)	-0.0396 (0.1422)
DBIr	-0.2154 (0.5771)	-0.4041 (0.2874)	-0.5008 (0.1840)	-0.3651 (0.2447)
DCSPi	-9.5712 (0.9701)	-480.2855 * (0.0609)	-200.0209 (0.4313)	19.3401 (0.9270)
ECTLSUKUK _t	-0.1108*** (0.0015)			

Note: (.) P-Value. Significance ***(1%), **(5%), *(10%).

To see whether *Sukuk* has a balanced relationship with inflation and economic growth through the monetary policy transmission mechanism, in this case, is the asset price channel, it is necessary to analyze the monetary sector variables. Regression results show that *Sukuk* has a balanced relationship that has a negative value with policy interest rates but is not significant. *Sukuk* has a balanced relationship with the composite stock price index in the short term which has a negative and significant value in the 2nd period which is -400.2855 (absolute value).

It can be concluded from the estimation results in Table III, it can be explained that the balance between *Sukuk* and inflation in the short term is positive but not significant. So it can be said that *Sukuk* does not have a balance relationship with inflation in the short term. To analyze the relationship between the balance of *Sukuk* in the long term, it is shown by the value of ECTLSukuk_{t-1} which is negative. The regression results in Table 3 show the ECT_{t-1} value of -0.111. This means that *Sukuk* has a balanced relationship to inflation and economic growth in the long run through the monetary transmission of asset price channels. Similarly, *Sukuk* has a long-term balance relationship with variables in the monetary sector.

The results of this test explain that in the process of the transmission mechanism of monetary policy through the asset price channel, *Sukuk* does not have a balanced relationship with policy interest rates but has a balance with the composite stock price index which is negative. This finding is almost in line with some research results in Indonesia by using event study methods such as Ainurrochma and Priyadi, (2016) which show that the value of *Sukuk* issuance has a negative relationship with stock returns but has no significant effect.

Fatimatuzzahra and Herlambang (2014) who explained that *Sukuk* issuance can have positive and negative effects, but there is a fluctuation in AAR (Average Abnormal Return) with very striking variations after the issuance of *sukuk* in Indonesia because there are negative abnormalities of 60 percent in the days after *Sukuk* issuance. Negative market reaction to *Sukuk* issuance is because investors still consider *Sukuk* to be the same as conventional bonds. Bonds only increase the company's leverage, where the use of debt can reduce the value of the company because there are a default risk and interest costs arising from the debt.

Similarly, the results of Purwaningsih and Khoiruddin's research (2016) showed that there were significant negative abnormal returns to the market reaction with the issuance of *Ijarah Sukuk*. The analysis explained that local investors did not consider the signal given by the company through the issuance of positive *Ijarah Sukuk* as an alternative to corporate financing. Unlike the case of Godlewski et al. (2014) which examined the market reaction to *Sukuk* issuance with several types of *Sukuk*

by taking a sample of eight countries and an event study method. The results of his research show that *Ijarah Sukuk* has a positive effect on market reaction while other types of *Sukuk* have no effect on the market reaction.

Analysis to answer the purpose of the second research is to see the results of Ordinary least square regression with multiple linear regression, which is to analyze the influence of *Sukuk* on inflation and economic growth through the transmission of monetary policy in Indonesia. The purpose of the analysis is to analyze the contribution of total *Sukuk* issuance over the period 2003-2017 (15 years) to inflation and economic growth which are the main targets in macro policy in Indonesia.

In the least square system the OLS model has been determined in advance the dependent and independent variables based on theory. The dependent variable in the asset price channel modeling is the inflation and economic growth variables that refer to Equations (15) and (17) with the VECM model.

To determine the effect of *Sukuk* in the short term, it can be seen from the coefficient of OLS regression results in the VECM model for the dependent variable Inflation and Economic Growth. Meanwhile, to determine the effect of *Sukuk* in the long term, it can be seen in the value of $ECTLSukuk_{t-1}$ on the OLS regression results the VECM model for the equation of the dependent variable is *Sukuk* through the asset price channel. In summary, the estimation results for analyzing the influence of *Sukuk* on inflation and economic growth in Indonesia are explained in Table IV.

TABLE IV. EFFECT OF *SUKUK* ON INFLATION AND ECONOMIC GROWTH

Dependent Variables	T-Statistic				F-Statistic
	DL <i>Sukuk</i>	DL <i>Sukuk</i> (-1)	DL <i>Sukuk</i> (-2)	DL <i>Sukuk</i> (-3)	
DLInf	2.5679	1.2718	2.2254	1.5433	[3.7335] (0.0000)**
	[15.050]	[0.7458]	[13.294]	[10.986]	
	(0.1345)	(0.4569)	(0.1858)	(0.2737)	
DLGDP	0.3630	0.1252	0.0235	-0.0396	[46.0311] (0.0000)***
	[23.4245]	[4.0460]	[0.7293]	[-1.4755]	
	(0.0000)***	(0.0001)***	(0.4670)	(0.1422)	
DBIR	-0.2154	-0.4041	-0.5008	-0.3651	[6.7228] (0.0000)***
	[-0.5589]	[-1.0676]	[-1.3347]	[-1.1681]	
	(0.1577)	(0.2874)	(0.1840)	(0.2447)	
DCSPI	-9.5712	-480.2855	-200.0209	19.3401	[1.5796] (0.0527)*
	[-0.0375]	[-1.8885]	[-0.7891]	[0.0918]	
	(0.9701)	(0.0609)*	(0.4313)	(0.9270)	
ECTLSukuk _{t-1}					-0.1108
					[-3.2383]
t-Table					(0.0015)
F-Table					1.960
					2.10

Note: Significance level at $\alpha =$ *** (1%), ** (5%), * (10%). [.] is the value of t-statistics and F-statistics and (.) is P-Value.

The estimation results show that *Sukuk* does not affect inflation in the short term. This is indicated by the t-statistic value smaller than t-table (1,960). However, *sukuk* influences economic growth in the short term, the t-statistics value is greater than t-table (1,960). Issuance of *Sukuk* emissions at present and in the previous period has an effect on economic growth. The issuance of *Sukuk* can increase capital accumulation through investment activities. For private (corporate) companies, capital accumulation obtained from *Sukuk* issuance is used to finance the company's production activities and for countries to finance fiscal deficits through the development process in the real sector. So that it can be concluded from the issuance of *Sukuk* can directly affect economic growth in Indonesia.

In the asset price channel, *Sukuk* has a significant effect on the instrument variable DCSPI on the 1st lag by 90 percent, but in multivariate regression shows that the composite stock price index has no effect on *Sukuk*. This result corroborates the results of previous research from Reboredo & Naifar (2017) which studies the relationship between the price of Islamic bonds (*Sukuk*) and conditions of financial and policy uncertainty using a quantile regression approach. *Sukuk* prices are not affected by economic policy uncertainty or stock market returns.

In the short term, *Sukuk* on the asset price channel does not affect the policy interest rate. But in the long run, the error correction term value is negative and significant in the *Sukuk* variable explains that *Sukuk* affects the policy interest rate variables, inflation, economic growth, composite stock price index and consumption. It can also be said that *Sukuk* has a relationship to long-term balance and is convergent with speed of adjustment or speed to correct disequilibrium of -0.1108 (11.08 percent absolute value) which takes 9.0253 or 9 months.

It can be concluded that if there is a shock on the *Sukuk* variable, *sukuk* requires less than one year to correct the imbalance that occurs towards long-term convergence. One of the results of this research is similar to previous research which explains

that there is a balance between Islamic finance and economic growth in Malaysia (Kassim, 2016). *Sukuk* is one of the products of Islamic finance and also has a balanced relationship with economic growth in Indonesia.

V. CONCLUSION

In the short term, *Sukuk* does not have a balanced relationship with inflation in the short term through asset price channels and exchange rates, but *Sukuk* has a balance relationship with economic growth in the short term through channel prices of assets and exchange rates. *Sukuk* also has a balanced relationship with the composite stock price index monetary variable in the asset price channel but does not have a balanced relationship on the monetary variable in the exchange rate channel. In the long run, *Sukuk* has a balanced relationship to inflation, economic growth and monetary variables in the channel of asset prices and exchange rates.

In the short term, *Sukuk* does not have an influence on inflation through the channel of asset prices and exchange rates in, but *Sukuk* has a positive effect on economic growth through the channel of asset prices and partial exchange rates. *Sukuk* also has a negative effect on the monetary variable, namely the composite stock price index through asset price channels and policy interest rates through the short-term exchange rate channel. Simultaneously, *Sukuk* has a positive effect on inflation, economic growth, interest rates policy, and the composite stock price index. In the long run, *Sukuk* has a significant influence and leads to convergence towards inflation, economic growth, and monetary variables (BIr and CSPI) through asset price channels and exchange rates.

The results of this study can be used as recommendations for policy makers (decision makers) of the central banks of Indonesia and the Indonesian government to make *Sukuk* as one of the alternative instruments for mixed policies in Indonesia (monetary-fiscal). This is supported by the results of research that *Sukuk* as an investment activity based on the concept of sharia in financing activities for capitalizing productive activities in Indonesia does not affect inflation in Indonesia but has a positive effect on economic growth. This implies that the development of *Sukuk* can maintain price stability in Indonesia and can increase economic growth in Indonesia.

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