Effectiveness of Conventional and Syariah Monetary Policy Transmission

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Abstract

Objective - The purpose of this study is to compare the effectiveness of monetary policy transmission through conventional and Islamic instruments through the interest rate channel and profit loss sharing / margins channel, to control the price level (inflation) and economic growth (output)
Method – Methodology used in this study is the Vector Auto Regressive (VAR) / Vector Error correction model (VECM) to see the effect of shock and long-term effects on inflation and output. Variables used are SBI interest rates, PUAB interest rate, deposit rates and lending rates, as well as from the Islamic side is SBIS yield, yield PUAS, profit lost sharing for the deposits and margin financing. This study use Unit Root Test, Cointegration degree of integration test, test causality, VECM and IRF estimates. Using monthly time series data from 2009 s / d 2012.
Result – Results of the study showed that the test based on Granger causality, overall, the transmission channel of monetary policy according to the conventional theory, while the monetary policy transmission channel Sharia can not be clearly identified and disconnected in yield / profit and loss sharing deposits. And based on the estimated VECM is known that in the long term Islamic instruments is the right instrument to control inflation.
Conclusion – This finding concluded that sharia instruments is the effective instrument in reducing inflation rate and also encourage the growth of Islamic banking, and should also consider the right margin level to increase the output on real sector.

Keywords : Monetary Transmission, Central Bank, *Industrial Production Index*, Consumer Price Index

Abstrak

Tujuan - Tujuan dari penelitian ini untuk mengetahui perbandingan efektifitas transmisi kebijakan moneter melalui instrumen konvensional dan Syariah melalui jalur suku bunga dan jalur bagi hasil/margin, untuk mengendalikan tingkat harga (inflasi) dan memacu pertumbuhan ekonomi (output).
Metodologi - Metodologi yang digunakan dalam penelitian ini adalah anaisis kuantitatif dengan Vector Auto Regressive (VAR)/Vector Error Corection Model (VECM) untuk melihat pengaruh shock dan pengaruh jangka panjang terhadap inflasi dan output. Variable yang digunakan adalah suku bunga SBI, suku bunga PUAS, suku bunga deposito dan suku bunga kredit, serta dari sisi syariah adalah imbal hasil SBIS, imbal hasil PUAS, bagi hasil deposito dan margin pembiayaan. Penelitian ini akan melalui uji Akar Unit, Uji derajat integrasi dan Uji Kointegrasi, uji kausalitas, estimasi VECM dan IRF dengan menggunakan data time series bulanan dari tahun 2009 s/d 2012.
Hasil - Hasil dari penelitian menunjukkan bahwa berdasarkan uji kusalitas Granger, secara keseluruhan, alur transmisi kebijakan moneter konvensional sesuai dengan teori, sedangkan alur transmisi kebijakan moneter Syariah belum dapat diidentifikasi secara jelas dan terputus diimbal hasil/profit dan loss sharing deposito.
Kesimpulan - Berdasarkan estimasi VECM diketahui bahwa dalam jangka panjang instrument syariah merupakan instrument yang tepat dalam mengendalikan tingkat inflasi.

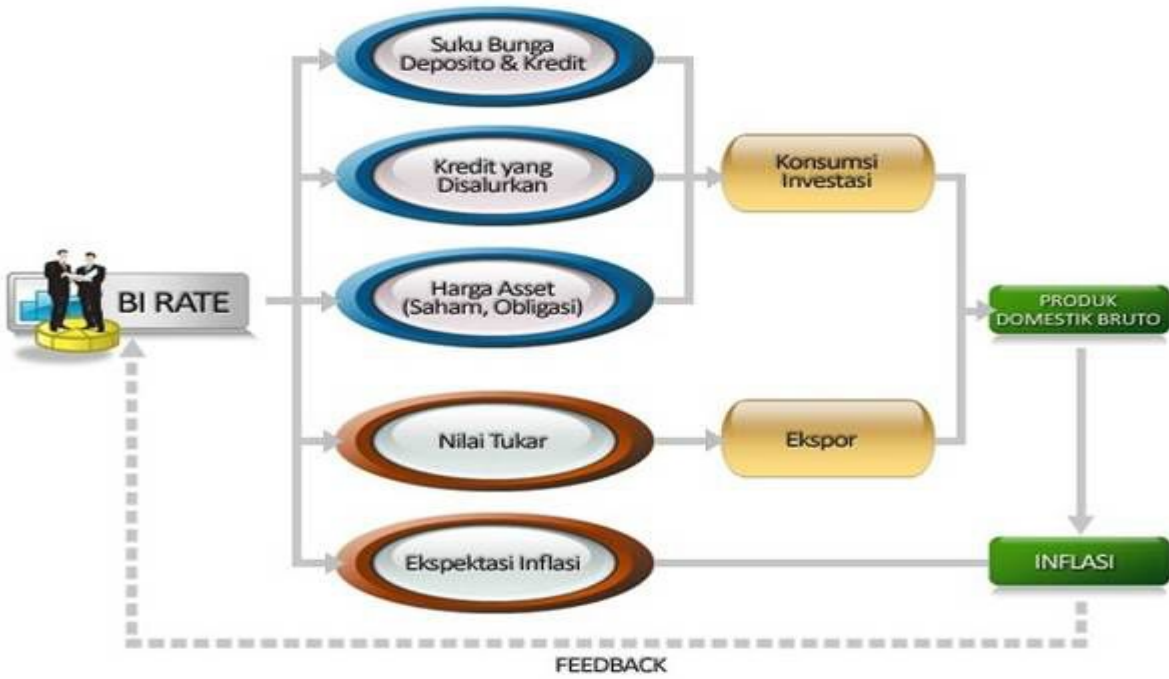
Kata Kunci: Transmisi Moneter, Bank Sentral, *Industrial Production Index*, Indeks Harga Konsumen

1. Introduction

Bank Indonesia (BI) as the monetary authority institutions has a variety instrument in determining monetary instrument to achieve the ultimate goal of controlling the price level, encourage economic growth (output) and reduce the unemployment level towards the overall public welfare.

The working mechanism of the BI Rate changes as monetary authority policy affecting inflation is referred to the transmission mechanism of monetary policy. This mechanism describes the policy of Bank Indonesia through changes in monetary instruments and operational target affected various economic and financial variables before ultimately affect inflation as its final destinations. The mechanism occurs through interaction between Central Bank, banking and financial sector, also real sector. BI Rate changes affect inflation through various channels, interest rate, credit channel, exchange rate, asset price and expectations channel (Bank Indonesia).

Figure 1: Monetary Transmission Policy



Source: Bank Indonesia

The process of monetary policy in affecting the real sector, is a complex process because the money is closely related to almost all aspects of the economy. Specifically (Taylor in Pohan, 2008) states that mechanism of monetary policy transmission is "*the process through which monetary policy decisions are transmitted into changes in real GDP and Inflation*." Mechanism of monetary transmission started since monetary authority or central bank action using monetary instrument in the implementation of policy until it has effects to economic activity, either directly or in stages. (Pohan, 2008).

Monetary transmission is a complex and interest topic because there is not one, but many, channels through which monetary policy operates. The process which monetary policy action are transmitted to the economy remains a debate in macro eceonomics. Monetary transmission will always face greater uncertainty about the timing and effectiveness of policy actions and results in maintaining macro stability. Therefore, gathering empirical evidences through research on the effectiveness of monetary policy transmission become the main and interest topic, especially after the global financial crisis, which has disrupted some channels of monetary transmission (Kenneth N. Kuttner and Patricia C. Mosser., 2002).

Effectiveness of the monetary transmission mechanism is varied and from time to time, depending on the economic condition and financial structure. Although monetary transmission channels have different effect to the real economy, there is also the relationship between the channel through which they can enhance or negate the effect of another channel in the process of monetary transmission, depending on the structure of economy and financial structure. Effectiveness of some monetary transmission mechanisms are varied and evolve over the time (Serhan Cevik and Katerina Teksoz, 2012).

Since the issuance of new Banking Act 1998, Indonesia in *de jure* has implemented a dual banking system, when conventional and Islamic banks can operate

side by side throughout Indonesia. Meanwhile, since the issuance of the new Bank Indonesia act in 1999, Bank Indonesia has been given the responsibility as the dual monetary authority that can operate conventional and Islamic monetary policy. Since then banking and Islamic financial growing rapidly (Ascarya, 2012).

Dual banking system adopted by Indonesia in the monetary system allows Bank Indonesia has a more various channels to reach the ultimate goal. Monetary channels based on syariah is assessed that can provide better effectiveness in achieving the ultimate goal of monetary, in this case of ultimate goal is the output level because syariah mechanism is closely related to the real sector.

Influence of monetary authority action against the economic activites occurs through various channels, that is money channel or direct channel, interest/ profit sharing channel, credit/financing channel, exchange rate channel, asset price channel and expectation channel. In finance, monetary policy affects the development of interest rates, exchange rate and stock prices as well as volume of public funds deposited in the bank, bank lending to the business, investment funds in bonds and stocks. Meanwhile, in real sector, monetary policy further affect consumption, investment and production, exports and imports, as well as the prices of goods and services in general.

Past studies related to the effectiveness of monetary policy transmission in the *Gulf Coperation Council* countries was made by Cevik and Katerina Teksoz (2012), this study empirically investigates the effectiveness of monetary policy transmission in *Gulf Cooperation Council* countries uses a structural vector autoregressive models approach. Results showed that the interest rate level and bank credit channel is relatively efficient in influencing the rice level and output, while the exchange rate channel is not significant as the channel of monetary transmission. Conclusions and suggestions were given in these studies is that policy measures and structural reforms strengthen the financial

intermediation and facilitate the development of domestic capital market will encourage the effectiveness of monetary transmission mechanism in the GCC countries.

Research on the effectiveness of transmission mechanism on dual monetary system conducted by Ascarya (2012) to discover transmission channel and dual monetary effectiveness through credit and financing channel to inflation and output using Granger and VAR method. The results show that the transmission mechanism of conventional monetary through conventional interest rate policy has a relationship to the output and inflation, while the profit sharing policy in syariah not related to the output and inflation. In addition, interest rate, conventional credit total, the interest rate of interbank money market, provide permanent and negative shocks impact on inflation and putput, while the profit-loss sharing (PLS), syariah financing, profit-loss sharing of inter-islamic bank money market, and (Sertifikat Bank Indonesia Syariah) as the interest rate islamic policy shocks gives a positive and permanent impact to the inflation and output. SBI (Sertifikat Bank Indonesia) as the conventional policy have a positive impact on inflation and negative impact on output.

Ayuniyyah, et al (2013) conducted a study to see the effectiveness of syariah monetary transmission against two major variables of macroeconomy, output and inflation, using VAR / VECM analysis. This study used monthly data from industrial production index (IPI), consumer price index (CPI, indeks harga konsumen -IHK), the number of Islamic banking deposits, total Islamic banking financing, money supply and SBIS (Sertifikat bank Indonesia Syariah),from January 2004 until December 2009. The finding indicated that all Islamic variables has significant effect to the real sector growth and the non-islamic variable does not affect the inflation rate.

This study wanted to see the effectiveness of conventional transmission using interest rate channel, interest rate of Bank Indonesia Certificates, interest rate of interbank money market, interest rate of third-party funds and the average credit interest, to see how

big is the influence on the ultimate goals of monetary policy that is inflation which represented by consumer price index (CPI) and output level which represented by industrial production index (IPI) to the realization of ultimate goals of monetary policy. Function can be written as follows:

IPI = f (SBI, PUAB, RATE DEPOSITO, RATE CREDIT)

IHK = f (SBI, PUAB, RATE DEPOSITO, RATE CREDIT)

Of the Islamic view, this study conducted a reassessment of transmission mechanism which affected syariah monetary policy transmission. This study will be supported by some variables that will be expected to have significant influence to the policy transmission in this study. Variable used in this study is Industrial Production Index (IPI) as a proxy of the output level, as conducted by Sukmana and Kasim on their research about transmission mechanism of syariah monetary policy in Malaysia.This study will also use profit-loss sharing of Syariah Bank Indonesia Certificates, profit-loss sharing of syariah bank money market, profit-loss sharing/margin from third party funds of syariah banking and margin level/average profit-loss sharing of syariah banking. Function can be written as follows:

IPI = f (SBIS, PUAS, PLS, MARGIN)

IHK = f (SBIS, PUAS, PLS, MARGIN)

In contrast to past studies, variables used in this study is the conventional interest rate level either SBI, PUAB, deposits interest rate and credit interest rate, and for syariah is used profit-loss sharing of SBIS, PUAS, Mudharabah Deposito and financing margin. This study is more concerns at the effectiveness of monetary transmission mechanisms of the conventional and syariah interest rate in influencing the ultimate goals of monetary policy, the inflation rate and level of production.

Based on the background as described above, this study analyzed the effect of transmission mechanism of conventional and syariah monetary policy to the output level and inflation.

2. Methodology

2.1 Data Sources

This study used monthly secondary data of the interest rate of Bank Indonesia Certificates, profit-loss sharing of Bank Indonesia Syariah Certificates, interest rate of interbank money market, profit sharing of syariah interbank money market, average interest rate of bank deposits, average profit-loss sharing of syariah bank, average credit interest rate (investments), average profit-loss sharing of syariah banking financing, which is taken from many sources such as Bank Indonesia and Statistical Centra Bureau from Januari 2009 until December 2012.

2.2 Operational Definition of Variables

The variables used in this study are as follows::

a. SBI : Interest Rate of Bank Indonesia Certificates

b. SBIS : Profit-Loss Sharing of Bank Indonesia Syariah Certificates

c. PUAB : Interest Rate of Interbank Money Market

d. PUAS : Profit-Loss Sharing of Syariah Interbank Money Market

e. RATEDEP : Deposits Interest Rate (1 month)

f. PLSDEP : Profit-Loss Sharing of Mudharabah Deposits (1 month)

g. RATECRED : Credit Interest Rate

h. MARGINFIN : Margin/Fee of Syariah Bank Financing

i. IHK : Ln_ IHK, Consumer Price Index representing Inflation

j. IPI : Ln_IPI, Industrial Production Index representing Output

2.3. Estimation Techniques

Before determining a proper model for data in this study, there are several steps that must be conducted first: (1). Unit Root Test that lately more and more popular used to test the stationarity of time series data. This test was developed by *Dickey* and *Fuller*, by using *Augmented Dickey Fuller Test (ADF)*. Stationarity test which will be used is the ADF test (*Augmented Dickey Fuller)* using a 5% significance level. Next is (2) Optimal Lag Length Test, the determination of the amount of lag (order) which will be used in the VAR model can be determined based on the criteria of *Akaike Information Criterion* (AIC), *Schwarz Information Criterion* (SC) or *Hannan Quinnon* (HQ).

Besides, testing the optimal lag length is very useful to eliminate the problem of autocorrelation in the VAR system, so that the use of optimal lag is expected no longer having autocorrelation problem. The third is (3) Analysis of Granger Causality, Causality test is used to determine whether an endogenous variable can be treated as an exogenous variable. This starts from the ignorance of relationship between variables. If there are two variables y and z, then whether y causes z or z causes y or applies both or no relationship between the two. The variable y causes z variable means how much of z value of the current period can be explained by z value in the previous period and y value in the previous period.

Next is (4) Cointegration Test, if the data is not stationary at the level, then the data should be derived on the first level (*first difference*) which reflects the data differences or changes. If data is stationary in the first derivative, then the data will be tested for the presence of cointegration between variables. If there is no cointegration between variables, then VAR can only be conducted on the first derivatives, and was only able to estimate the short-term relationships between variables. If there is cointegration between variables, then VECM can be conducted using the data level to discover long-term relationship between variables. VECM can estimate both short-term and long-term relationship between variables (Ascarya, 2012). The method which can be used to test the

presence of this cointegration is the *Johansen Cointegration* methods. Next is (5) Analysis of *Impulse Response Function* which used to determine the response of endogenous variables to shocks on a particular variable. IRF also used to see the shock on the other variables and how long these effects occur.

3. Discussion Analysis

3.1 Stationary Test and Lag Length Test

Results of the data stationary test showed only PUAS variable and the average profit-loss sharing of mudharabah deposito are stationary at the level, while remaining variables stationary at first difference. Hence the variable derived to the *first differencing* degree, as listed in the table below.

Table 3.1
Augmented Dickey Fuller Test (First Differencing)

No	Variable			Ho = Not stationary Ha = Stationary
		ADF test	CV 5%	
1	LNIHK	-5.028053	-3.523623	Stationary
2	LNIPI	-7.773449	-3.510740	Stationary
3	SBI	-4.374055	-3.510740	Stationary
4	SBIS	-4.374055	-3.510740	Stationary
5	PUAB	-4.658747	-3.510740	Stationary
6	PUAS	-9.016359	-3.518090	Stationary
7	RATEDEP	-5.170978	-3.510740	Stationary
8	PLSDEP	-4.942526	-3.508508	Stationary
9	RATECRED	-5.997213	-3.513075	Stationary
10	MARGINFINAN	-8.270717	-3.510740	Stationary

The second step is to determine the optimal lag based on the shortest lag, using Hannan-Quinnon Criterion (HQ) or Schwarz Information Criterion (SC). Results showed both output model and inflation have one optimal lag through conventional channel and syariah channel.

3.2 Granger Causality Test

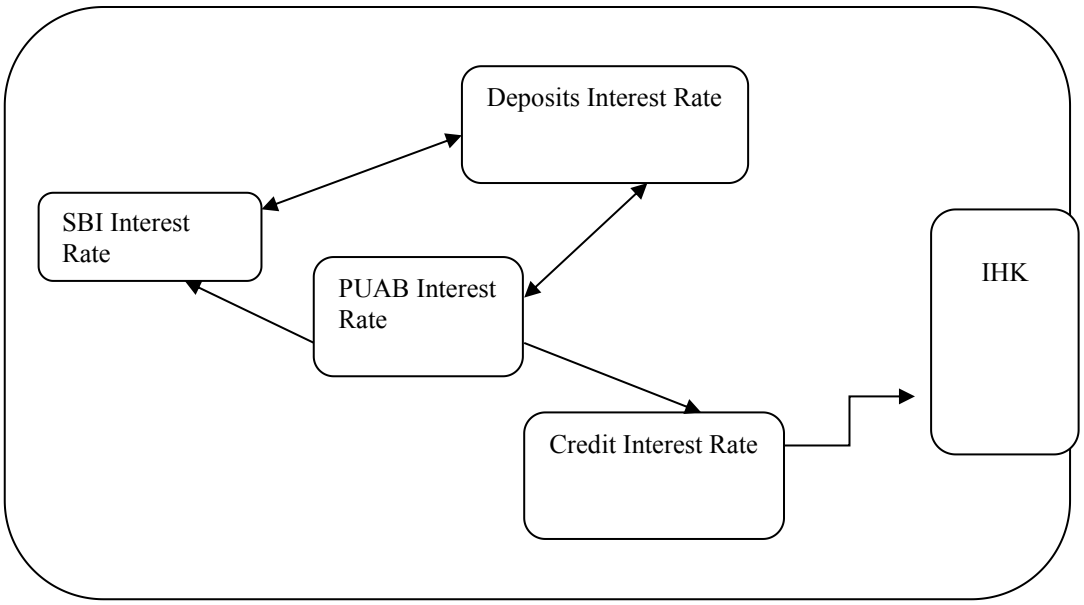
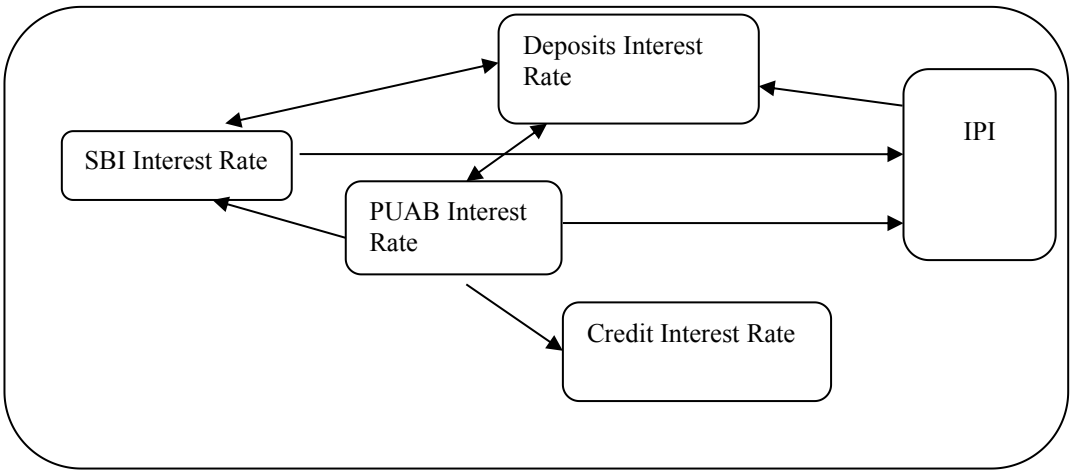


Figure 3.1 The Flow of Monetary Transmission on Conventional to Inflation (IHK)

Granger Pairwise Causality test to IHK model through conventional channels indicates that no continuity of interest rate channel and does not match with the theory. The theory states that SBI interest rate will be transmitted to PUAB interest rate and later to deposits interest rate. By intermediary mechanism deposits interest rate will be transmitted to credit interest rate and finally to inflation. This paper finding SBI Interest Rate transmitted to Deposits Interest Rate and deposits interest rate give reverse effect to the SBI interest rate. In the other than deposits interest rate transmitted to the PUAB Interest Rate give reverse effect to the SBI. PUAB also share its transmission to the Credits interest rate, then to inflation (IHK).



Granger Pairwise Causality test for IPI model through conventional channels indicates the absent of continuity interest rate flow to the theory. This paper found that the SBI interest rate directly affect the Output (IPI). On the other hand SBI interest rate transmitted to PUAB interest rate and then affect the IPI. PUAB interest rate and deposits interest rate affect each other and credits interest rate affect PUAB interest rate.

This finding did not match with the previous monetary mechanism theory which is stated that SBI interest rate will not directly give effect to output. It needs structural mechanism approach via interest rate channel to influence output.

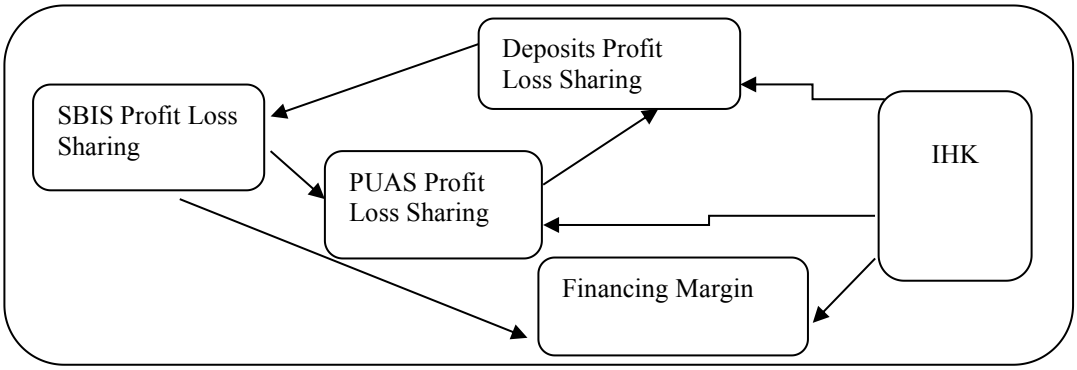


Figure 3.3 The Flow of Monetary Transmission on Syariah to Inflation (IHK)

Granger Pairwise Causality test for IHK model through syariah channels indicates the absences of continuity SBIS profit-loss sharing channel to PUAS and stopped in deposits Profit loss sharing. SBIS profit-loss sharing give effect to financing

margin. From the test above, inflation (IHK) affect the deposits profit loss sharing, PUAS profit-loss sharing and financing margin. This is consistent with research Ascarya (2012).

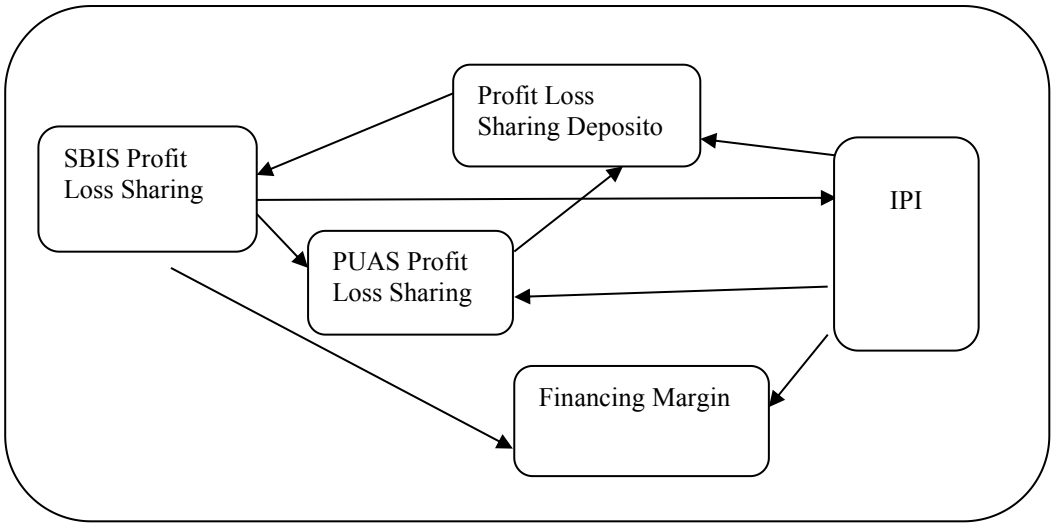


Figure 3.4 The Flow of Monetary Transmission on Syariah to Output (IPI)

Granger Pairwise Causality test for output model (IPI) through syariah channel indicates that there is no continuity, SBIS profit-loss sharing channel has direct effect to the IPI. IPI affect the deposits profit-loss sharing and financing margin. The flow of monetary transmission through SBIS profit-loss sharing channel to PUAS and stopped in deposits profit-loss sharing.

3.3 Cointegration Test

The next test is to determine the existence of cointegration between variables. If there is no cointegration between the variables, then VAR can only be conducted on the first derivatives, and it was only able to estimate the short-term relationships between variables. Cointegration test using Johannsen method based on *trace statistics* used to determine the number of equation systems that could describe the long-term relationships. The results shows that the output model has one cointegrated equation, and inflation model represented by IHK also has one cointegrated equation at the 5% critical value.

3.4 Impulse Response Function

3.4.1 IRF (Impulse Response Function) for IHK Model through Conventional Model

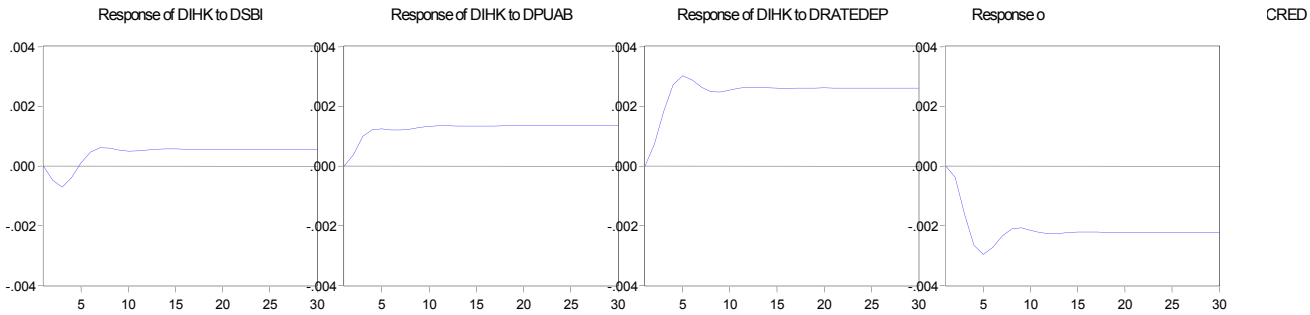


Figure 3.5 : Response of IHK due to shock of DSBI, DPUAB, DRATEDEP and DRATECRED

Seen in the figure above the effect of SBI shock to the IHK, IHK who initially respond negative to the SBI chock, then in the fifth period IHK gave a positive response, the period of stability occurred in the range of seventh period in which IHK gave a positive response by 0,0008 percent. IHK responds positively to the PUAB shock until the fifth period, after that IHK tends towards stability on the tenth period by 0,0018 percent.

That means an increase in SBI aimed to reduce inflation does not run in the long term. In the long term an increase in SBI will increase inflation, due to the SBI as a benchmark of bank lending and credit, when interest rates rise it will increase the cost of borrowing. When the cost of borrowing is higher then the cost of production will also relatively higher and it will reduce the investment decision and in the long term will influence economic growth.

The finding support that even the deposits interest rate is higher it did not follow by the decreasing of cost of borrowing. The bank seems maintain its interest rate margin. The high cost of production which in turn increase the price of goods so will lead inflation. IHK response to the deposit rate shock occurred at the beginning of the period

until the fifth period in which gave positive response at the maximum point, after that IHK decreased and returned climbing up to the range at the eleventh period, and further reach the stability and still respond positively by 0,003 percent. IHK responds negatively to credit shock and reach the stability at the tenth period by -0,0025.

3.4.2 IRF (Impulse Response Function) for IPI Model through Conventional Model

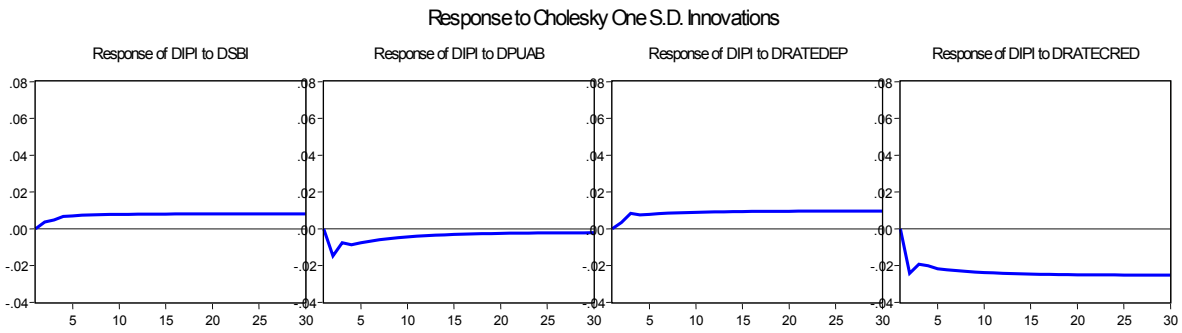


Figure 3.6 : Response of IPI due to shock of DSBI, DPUAB, DRATEDEP and DRATECRED

Seen in the figure above the effect of SBI shock to the, in which respond positively to the SBI shock and at the seventh period reach the stability by 0,01 percent. This means that an increase in SBI will increase economic growth. It is contrary to the theory where when SBI rose the level of output should be decreased, this happens due to the stability of other macro indicators, thus increasing the SBI does not give a big impact to the output and actually increase output. IPI respond negatively to the PUAB until fifteenth period, after that IPI reach the stability by 0,005 percent. IPI response to the deposit rate occurred at the beginning of the period until fifth period in which respond positively and reach the stability by 0,01 percent. IPI respond negatively to the credit shock and reach the stability at the twelfth period by -0,03 percent. This is consistent with the theory which when lowered lending rates will increase the output.

The role of interest rate channel is still important for determining the inflation rate, from the previous finding was done by Wulandari (2012). The paper assesses the

importance role of two monetary transmission mechanism channels in managing inflation and contributing to economic growth in Indonesia, by employing Structural Vector Autoregression (SVAR) model. The monetary transmission channels are interest rate channel and credit-bank lending channel. It is shown that interest rate channel plays important role in monetary transmission mechanism for maintaining inflation but has limited role in the economic growth. In the other hand, credit-bank lending channel can effectively affect economic growth

3.4.3 IRF (Impulse Response Function) for IHK Model through Syariah Model

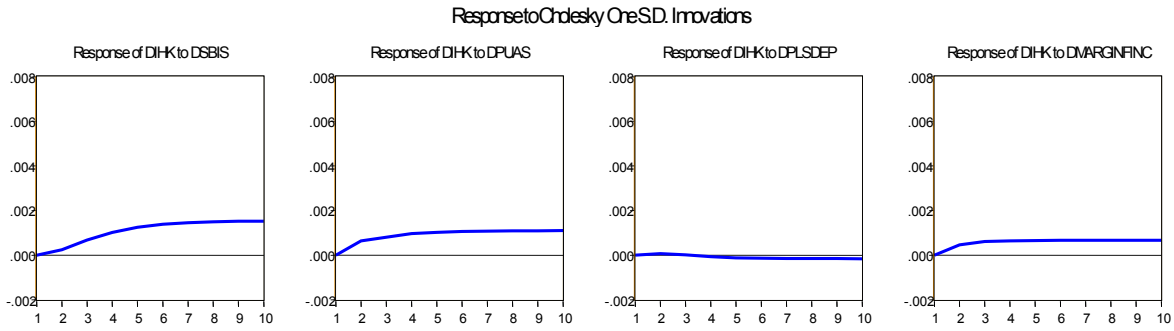


Figure 3.7. Reponse of IHK due to shock of DSBIS, DPUAS, DPLSDEP and DMARGINFINC

From the figure 3.7 above seen that the IHK respond positively to the shock caused by SBIS and reach the stability at the eighth by 0,001 percent. This is means SBIS instrument not running in line with expectations which in this study SBIS trigger an increase in inflation, this is because the returns SBIS still follow the benchmark of SBI and achieve stability in the period to 8 with a value of 0.001 percent. IHK also respond positively to the PUAS shock and reach the stability at the seventh period by 0,001 percent.

This proves that the IHK is not affected by the PLS-DEP, meaning that the PLS-DEP is the appropriate instrument for use in the financial system due to the activity of PLS-DEP that does not give effect to inflation, the value of which is almost close to zero. Results of margin financing shocks with a positive response by the IHK and experiencing

shocks until the third period, after the experience of long-term stability in the fifth period with a range of values of 0.001 percent IHK tend to gave a stable response due to deposit sharing shock, with values slightly zero. Results from the shock of financing margin responded positively by IHK and shaken until third periods, after that it had long term stability at the fifth period by 0,001 percent.

3.4.4 IRF (Impulse Response Function) for IPI Model through Syariah Model

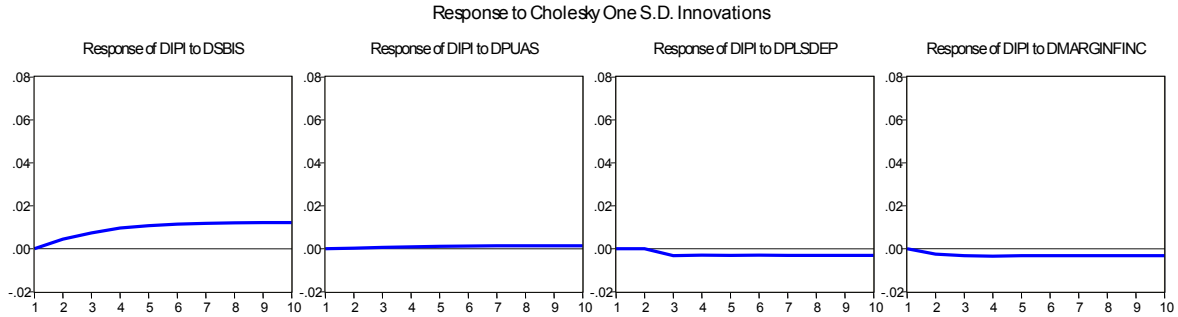


Figure 3.8. Response of IHK due to shock of DSBIS, DPUAS, DPLSDEP and DMARGINFINC

Seen from the figure above the effect of SBIS shock to the IPI, which responds positively to the SBIS shock and at the seventh period reach the stability by 0,01 percent. PUAS tend not to give a shock to the IPI where the stability level is in the range of 0,001 percent at the third period until seventh by 0,002 percent. IPI response to the deposit sharing shock occurred at the beginning of the period until the third period with negative response and reach stability by -0,005 percent. IPI responds negatively to the financing margin shock until the third period and reach the stability at the third period by -0,008 percent.

4. Conclusion

This empirical study provides several important findings, first, based on Granger causality test, overall conventional monetary policy transmission channel showed no continuity and not in accordance with the theory, as well as the transmission channel of

monetary policy sharia can not be clearly identified and disconnected in yields or profit and loss sharing deposits. Deposit yields using contract profit and loss sharing, as well as mudaraba and Musharaka financing margin significant negative effect on the real sector output and does not have a significant influence on the level of inflation. By meant, syariah instruments is the effective instrument in reducing inflation rate and also encourage the growth of Islamic banking, and should also consider the right margin level to increase the output on real sector.

Second, the results of overall IRF, shock of SBI, PUAB, deposit rate have a positive impact to the inflation, means will increase inflation in the long run and this respon is permanent. Credit interest rate (conventional) have negative impact and permanent to the inflation. SBI rate and deposit rate have positive effect to the economic growth and PUAB interest rate and credit interest rate have negative effect and permanent to the economic growth, this suggests an indication of speculative behaviour. This means a decrease in lending rates will increase the inflation which is in line with the theory. On the other side, shock of SBIS, PUAS, deposit sharing and syariah financing have positive effect and permanent to the inflation. Deposit sharing and financing margin have negative effect to the economic growth, but slightly zero and showed no indication of speculative behaviour.

From the result of these studies lead to the empirical conclusion that monetary policy to reduce inflation with Islamic pattern is more effective than the conventional pattern, in accordance with research by Ascarya (2012) which examined the dual monetary system through conventional credit channel and syariah financing.

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