Transmission Mechanism In Dual Monetary System: Comparison Between Shariah And Conventional Monetary System

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Abstract

Transmission mechanism of monetary policy has been an area of critical economic research in many countries, whereby financial system links monetary policy and real one. In line with this, whatever events or trends that affect financial system would also lead to the changes in the monetary transmission mechanism. This study tries to analyze the transmission mechanism in Indonesia dual monetary system using Vector Auto Regression (VAR) and Vector Error Correction Model (VECM) methods. The result indicates that the relationship between Consumer Price Index (CPI) and Sharia Instruments Financing (LNFIN), Bank Indonesia Sharia Certificate (SBIS) and Sharia Inter Bank Money Market (PUAS) are negative. It denotes that when the total of sharia financing increases, it will give a positive contribution to reduce inflation rate in Indonesia. Henceforth, this system will create a balance growth between monetary and real sector economy. From the perspective of this finding, it is urging for the stakeholders of sharia finance, especially monetary authority, to accelerate sharia banking share in Indonesia.

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*Keywords***:** Transmission Mechanism, Dual Monetary System, Sharia Instruments, VAR/VECM

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I. INTRODUCTION

I.1 Background of Problem

Money is not everything, but without money economic transaction would be restrained. It is like an artery for business of human life and economic as a whole. It is for that reason; one issue that needs to be criticized deeply is whether the process of monetary policy, especially its transmission mechanism, would reach the real sector economy? In other words, this process conceptually termed as transmission mechanism of monetary policy. Transmission mechanism is a channel or a mechanism that bridge monetary policy and economy (Pohan, 2008). Bernanke and Gertler emphasized on *credit channel* while Obstfeld and Rogoff prefer to emphasize the concept of transmission mechanism more on exchange rate policy (McCallum in Hardianto, 2004). Some of economist agreed upon that transmission mechanism is intermediary process that caused a change in real GDP as well as inflation through monetary policy mechanism.

Bank Indonesia or Central Bank of Indonesia as a monetary authority, through operation market, employs Central Bank interest rate as an instrument to influence loan/debt demand so that would lead to aggregate demand accordingly. The transmission mechanism through *interest rate* channel started from *short term rate* then spread out to the *medium* and *long term rate* (Warjiyo, 2003). When tight monetary policy implemented by the government, the increasing in interest rate would lead to the decreasing in some sectors that related to banking industry due to price increase.

From the perspective of debtor, such decrease situation is caused by the additional risk faced by the debtor due to the additional interest cost while their income remain fixed or even decreases. In a condition where imperfect substitution happen between bonds and loan would lead to both of these instrument have *coexistence's* character. The result is, a change in interest rate would not encourage debtor to switch their investment behavior into bonds. On the other hand, tight monetary policy would encourage debtor to move from *risky loan* to *safe bonds* so that causing aggregate demand decrease accordingly since investor and debtor deduct their total investment (Hardianto, 2004).

Since 1992, indicated by the establishment of the sharia bank that is Bank Muamalat Indonesia, there are two banking system in Indonesia; *Interest Rate System* (IRS) and *Profit* and *Loss Sharing System* (PLSS) or *Free Interest Rate System* (FIRS). Since sharia system has SWBI (*Wadiah Certificate of Bank Indonesia*) instrument, Indonesia has *dual monetary system;* interest rate and profit and loss sharing systems. The later is implementing their calculation principle base on producer or debtor (*mudharib*) revenue and having flexibility in term of returning the share. With this system, the additional of money circulation/supply would follow the additional real output accordingly.

Mirakhor in Alaro and Hakeem (2011) defined an Islamic financial system as one in which there are no risk free assets and where all financial agreements are based on risk and profit and loss sharing. All financial assets are contingent claims and there are no debt instruments with free or floating interest rates. Modeling the financial system as non-speculative equity shares, he showed that the rate of return to financial assets is primarily determined by the return ne positive returns. Under Islamic financial system, banks do not contract interest bearing loans and neither creates nor destroys money. They participate directly in production and trade operations on a profit-loss sharing basis.

The existence of profit and loss sharing system would bring about the possibility of debtor migration from interest system to profit and loss sharing one. In fact, this substitution mechanism would cause a *lack* happen in monetary policy. Another possibility is, it would reduce negative effect caused by a decreasing in conventional loan. This reduction phenomenon comes into emergence due to sharia loan mechanism which creates balance between monetary and real sector development. Hence, the additional sharia financing share would then reduce inflation rate.

This study would try to identify and compare the process of monetary transmission from financing/credit mechanism in Indonesia which are having dual monetary system; sharia financing and credit channel in conventional bank. Secondly, this study would like to proof whether sharia financing mechanism would create a balance between monetary and real sector so that lead to squeeze inflation rate. Hence, these study also intense to measure how effective sharia monetary instruments, including conventional, to deal with real sector achievement.

II. THEORETICAL FRAMEWORK
II.1 The Concept of Transmission Mechanism (Monetary Policy)

Transmission mechanism of monetary policy is a channel that link monetary policy and economy. Monetary transmission mechanism starts to work when monetary authority or central bank employs monetary instrument in their monetary policy implementation until, directly or gradually, have an effect to the economic activity. The effect of such policy towards economic activities would happen accordingly through some channels, that is: money channel (*direct effect*), interest rate channel, credit, exchange rate, asset price and expectation channel (Pohan, 2008).

For it peculiar reason, in monetary economics theory, monetary policy of transmission mechanism commonly termed as "black box" (Mishkin in Pohan, 2008). The reason is that, this monetary transmission considerably affected by three dominant factors as follow: (1) behavior adjustment of central bank, banking industry and economic player in their economic activities as well as finance; (2) time lag since the implementation of monetary policy until the achievement of last target; and (3) there exist the changes in the channels of monetary transmission itself along with national economic development.

In a traditional and closed economy where bank only the solely financial institution, the relationship between velocity of money and real economy activity relatively strong. However, the more develop economic and financial sector of a nation the more far apart the relationship between velocity of money and that of real sector. In fact, majority of financial institutions fund are circulated and concentrated in monetary sector with small portion in real sector. Such a change relationship pattern of economic and financial variables would lead to the time lag duration of transmission mechanism of monetary policy.

Meanwhile in an opened economy along with the globalization stream, the development of a nation would also be affected by economic development of other nation. This influence might happen through the fluctuation of currency exchange, export-import activity as well as balance of payment of an involved nation. In such condition, the role of transmission channels like interest rate, credit and value exchange would become very important. So is the role of asset price channels like obligation, stock and expectation.

II.2 The Stage of Monetary Transmission

Actually transmission of monetary policy is an interaction between central bank as monetary authority with that of banking and other financial institutions and other economic player in real sector. This interaction happens via two stages process of money circulation. *First*, the interaction between central bank with that of banking industry and other financial institutions with various transactions in money market. *Second*, the interaction related to the intermediary function between banking industry and other financial institutions with that of economic player in various real sector activities.

The first stage of interaction in money market existed in an indirect monetary policy system which commonly applied that is through intermediary financial institutions (e.i banking industry). In one side, central bank doing monetary operation through money transaction with banking industry, while in other side banking does the money transaction in their portfolio investment. This interaction would happen through money market or foreign exchange market. The interaction between central bank and bank industry in such a way would affect to the volume as well as market price (interest rate, exchange value, yield obligation and stock price).

The second stage of interaction of the transmission of monetary policy entails banking industry with that of economic agent in the real sector. In this context, banking is acting as an intermediary institution. Whereby, it mobilizes third fund in term of saving or deposit and lend it to the debtor or business entity. From mobilization perspective, this interaction would affect interest rate, saving and deposit volume which are part of money circulation M_1 (in a narrow meaning) dan M_2 (in a wider meaning). In a condition where bank want to increase their saving or deposit, interest rate would be increased to stimulate customer saving preference.

While from the lending side, such interaction would affect the growth of banking credit/financing. If bank would like to increase their credit/financing expansion, interest rate would decrease accordingly so that encourages people to borrow or to have a financing more from the bank.

II.3 Transmission Channel of Monetary Policy

As has been discussed earlier in line with the rapid growth and economic structural changes in monetary sector, there exist at least six channels of transmission mechanism of monetary policy which has been commonly put forward in contemporary monetary theory. Those of six channels are direct monetary channel, interest rate channel, asset price channel, credit channel expectation channel.

a. Direct Monetary Channel

Direct Monetary Channel of transmission policy or money channel is referring to classical theory of the role money in economy which discussed from the beginning by Fisher in his *Quantity Theory of Money*. Basically, this theory describes clear framework about direct relationship analysis between velocity of money and price which is denoted by the popular equation: **MV = PT**. In an equilibrium condition, velocity or circulation of money that being used in various economic transactions (MV) is equal to the total of nominal output that being transacted in an economy. The quantity theory of money emphasizes that money demand is for transaction. In fact, this approach has been revised by Keynes that demand of money is for transaction, precautionary and speculation.

b. Interest Rate Channel

Apart from Direct Channel which emphasizes in quantity aspect of money circulation in an economy, Interest Rate Channel emphasizes more on the significance of price in financial market to the real sector economy. In this context, monetary policy addressed by central bank would affect the development of interest rate in financial sector and afterwards would affect the inflation and real output. At the first stage, monetary operation of central bank would affect short run interest rate like Central Bank Interest (SBI) and Interbank Money Market Interest (PUAB). At the end, this change would have an effect to the changes of bank's deposit interest rate as well as its credit interest rate. Usually, the change process of bank interest rate to the customers will not happen immediately. It should be a *time lag* caused by an internal bank condition in their asset management.

The next step is interest rate transmission from monetary sector to real sector will depend on its effect to the consumption and investment demand. The effect of interest rate to consumption behavior related to the role of interest as an income for customer attained from deposit (*income effect*) and credit interest as a source of customer financing (*substitution effect*). Meanwhile, the effect of interest rate to investment demand would certainly happen because credit interest is cost of capital component

apart from yield obligation and stock dividend. The effect of interest rate to both of consumption and investment demand would then followed by its effect to the aggregate demand and at the end would determine inflation rate as well as real output.

c. Saluran Kredit (Credit Channel)

Transmission mechanism of monetary policy approach through credit channel base on the assumption that not all saving/deposit in term of money (M1 dan M2) would be released by bank in term of credit. In other words, bank intermediary function would not be so perfect. Meaning that the increase in bank deposit (third fund) would not automatically followed by the increase in credit or financing. The most influential thing to the real economy is banking credit/financing not people deposit or saving.

In conjunction with the interaction between central bank, banking industry and real sector, there will be an interaction between central bank and banking industry in the first step within the domestic market. This interaction would not only affect the progress of short term interest rate in money market but also have an effect to the fund volume allocated by bank in term of liquidity instrument and credit (financing). The next step would be monetary policy transmission from banking industry to real sector through out credit financing caused by various factors either internally or externally. Hence, the growth of credit financing will have an effect to the real sectors such as consumption, investment as well as production activities. At the end of the day, it would affect goods and services price.
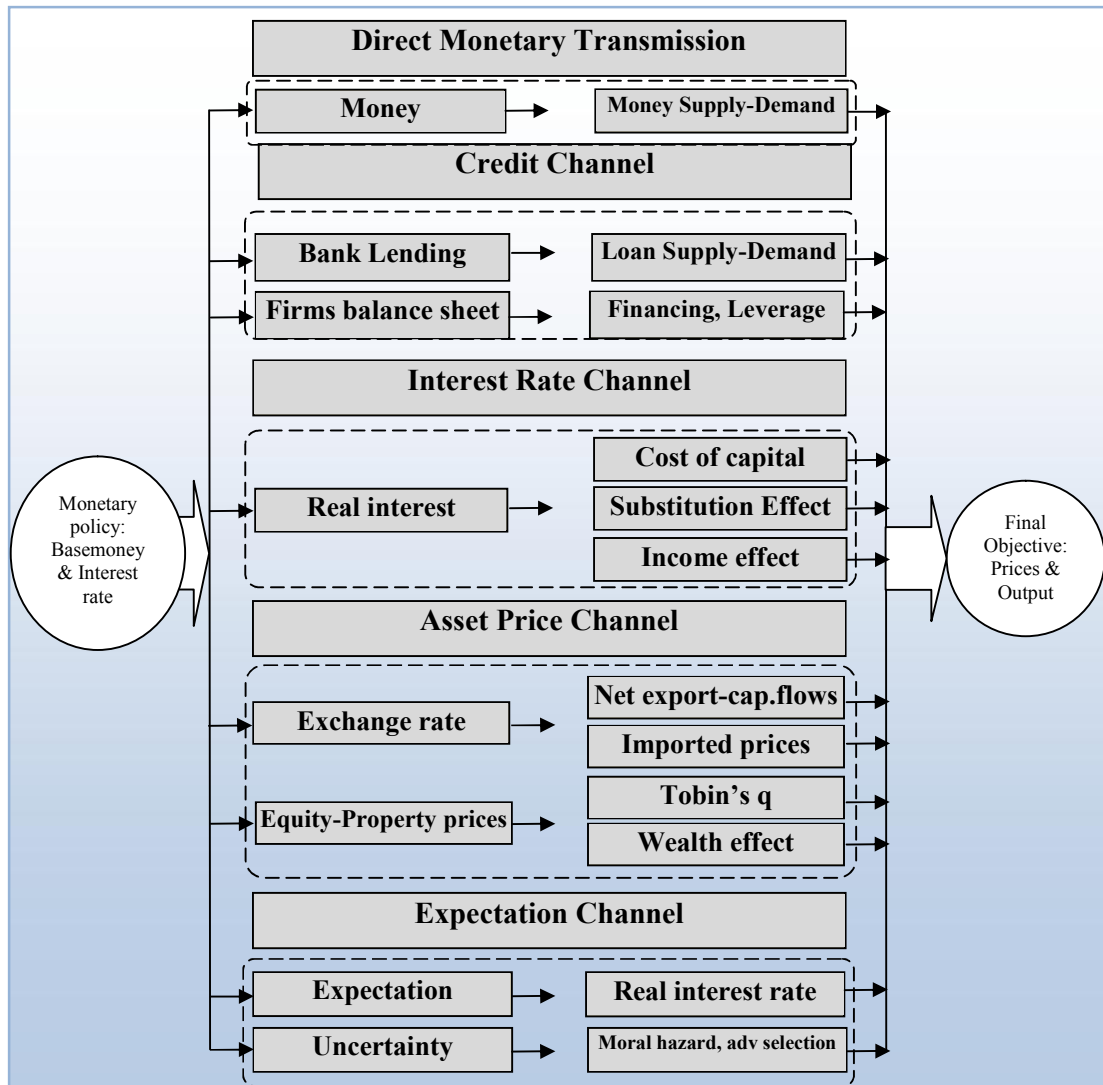
d. Asset Price Channel

Asset price transformation, either in term of financial asset (e.i. obligation and stock) or tangible asset (property and gold), is affected directly by the monetary policy. In fact, investment portfolio which caused transmission come in being are not only in term of bank deposit and other instruments in money market, but also might be in term of obligation, stock as well as tangible asset. The fluctuation of interest rate as well as exchange rate would have an effect to the volume of transaction and the price of obligation, stock and its tangible asset. Hence, such asset price changes would then have an effect to the real sector activities such as consumption demand due to either wealth effect substitution and income effect.

A part from the above condition, the effect of asset price to the real sector also taken place to the investment demand by business entity. It is related to the effect of asset price changes to the cost of production structure and investment whereby at the end would have an effect to the aggregate demand, output as well as inflation.

e. Expectation Channel

One thing that should have more attention in the context of monetary policy is people expectation to inflation. Expectation theory stated that if people are rational enough, they would be aware to have certain action or planning to anticipate the appearance of inflation. The anticipation could be in term of reducing the volume of money by expense them in real goods so that loss risk caused by inflation can be totally

avoided. People expectation to the price increase would then lead to the increase of interest rate. In fact if interest rate increases smaller than an increase in price, there will be a decrease in rate of return on financial asset. The later situation would then encourage people to shift their asset from financial asset to the real one.

Direct Monetary Transmission

| Money | → | Money Supply-Demand |

Credit Channel

| Bank Lending | → | Loan Supply-Demand |
| Firms balance sheet | → | Financing, Leverage |

Interest Rate Channel

Real interest	→	Cost of capital
		Substitution Effect
		Income effect

Asset Price Channel

Exchange rate	→	Net export-cap.flows
		Imported prices
Equity-Property prices	→	Tobin's q
		Wealth effect

Expectation Channel

| Expectation | → | Real interest rate |
| Uncertainty | → | Moral hazard, adv selection |

Monetary policy: Basemoney & Interest rate

Final Objective: Prices & Output

Source: Warjiyo (2003)

Figure 2.1. Monetary Transmission Channel

II.4 Previous Research

The following are main character of transmission mechanism in some countries, either developing or developed countries.

Table 2.1 Transmission Mechanism in some countries

Country	Main Character
Developing Country	
Brazil	Interest rate influences inflation with min lag 6 months and there exists past *pass-through* exchange rate effect.
Chile	Indexation encourages *downward price inertia* and accelerates transmission process (around quarterly) from exchange rate shock and wage to inflation.
Cesk	Transmission mechanism has been relaxed with the existence of financial sector vulnerability.
Israel	Indexation encourages past *pass-through* exchange rate effect to price. Last development indicates that such effect is also longer.
Poland	Transmission of credit channel not really strong due to banking sector structure and undeveloped financial market.
South Africa	Interest rate influences inflation with lag, while the relationship between money circulation and inflation is weak.
Developed Country	
Canada	Transmission mechanism has been well developed with lag between 6-8 quarterly and varied from time to time.
Finland	Transition to the flexible exchange rate system has weakened transmission mechanism and add exchange rate volatility.
New Zealand	Transmission mechanism has been well developed with lag between 6-8 quarterly and varied from time to time.
Spane	Real exchange rate is the most important transmission channel.
Sweden	Transmission mechanism has been well developed with lag been 5-8 quarterly.
England	Monetary policy has a maximum effect to the output after one year and to the inflation after two year.

Source: Pohan, 2008

Some countries have transmission mechanism that has been well developed, like: Canada, New Zealand, England and Sweden. In fact, majority of emerging market (developing countries) with high inflation are dominated by transmission channel with *downward price stickiness* and *pass-through* effect character from exchange rate to inflation like Brazil, Chile and Israel.

Meanwhile, previous research related to sharia monetary transmission topic has been done by Hardianto (2004). Having the same case in Indonesia, he concluded that: (1) There was no substitution mechanism between loan product of conventional system and sharia one, and (2) Sharia loan/financing has positive relationship pattern with

inflation Customer Price Index (CPI/LNIHK). According to his finding, an equivalence that should come into exist between monetary and real sector do not happen. This condition is concluded due to an increase in sharia bank financing do not followed simultaneously by the same pattern in real sector transaction.

Sukmana and Kasim (2010) found in their research that both Islamic banks' financing and deposit play important roles in the monetary transmission process in the Malaysian economy. In particularly, both Islamic deposit and financing are shown to be statistically in linking the monetary policy indicator to the real output.

In the same point Sanrego and Nikmawati (2010) in their research found that *sharia financing* could reduce negative effect of interest rate to inflation after the sixth month. However, substitution mechanism between *sharia financing* and conventional credit do not happen when interest rate increases.

The difference of this research with the previous ones is: (1) this research is trying to analyze relationship pattern among monetary instruments either sharia [Bank Indonesia Sharia Certificate (SBIS), financing and Sharia Inter Bank Money Market (PUAS)] or conventional [Central Bank Interest (SBI), banking credit, and Inter Bank Money Market (PUAB)] with inflation. Compare to Hardianto (2004) research which included Wadiah Certificate of Central Bank (SWBI), this research will include Bank Indonesia Sharia Certificate (SBIS) which issued in April 2008 in the model. Hence, this research will have Indonesia as a research object compare to Sukmana and Kassim as well as Sanrego and Nikmawati which employ Malaysia as their research object. Last but not least with regard to the time period, whereby this research using data from 2002 until mid of 2008.
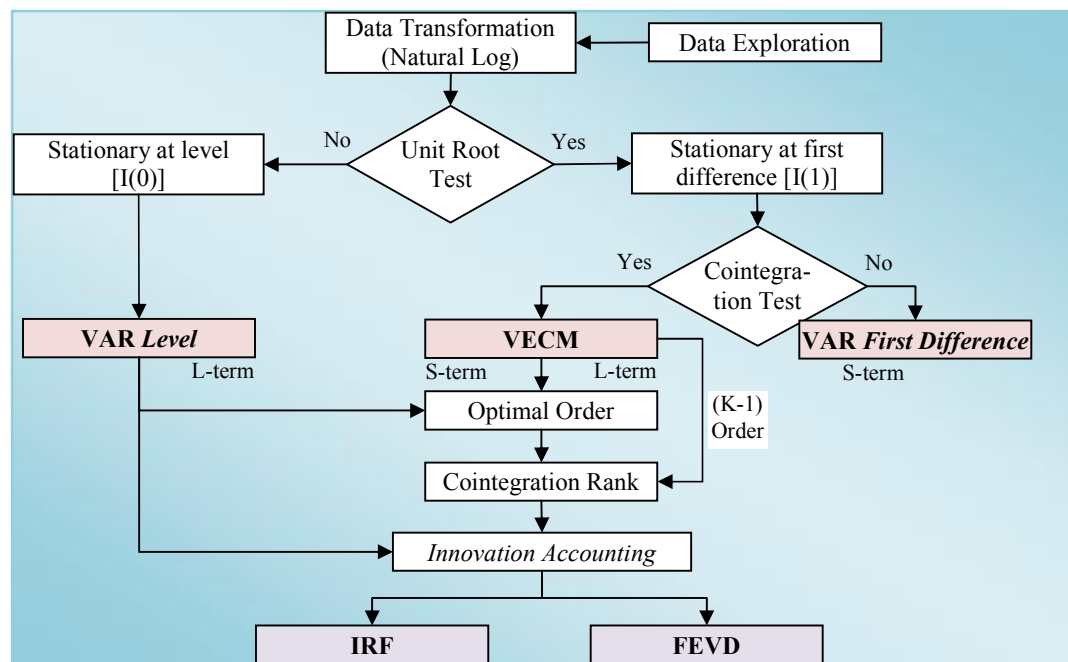
III. DATA AND METHODOLOGY

III.1 Type and Data Sources
This research will employ monthly time series secondary data that could be taken from Indonesia Economic and financial Statistic at Bank Indonesia (SEKI-BI), Sharia Banking Statistics (SPS) and Indonesia Banking Statistics (SPI). The data would begin from January 2003 until March 2009. Inflation rate as dependent variable is employing Indonesia Consumer Price Index (CPI). The total of Sharia Banking Financing (LNFIN) is the total financing that issued by sharia banking minus Sharia Rural Banking (BPRS), while the total of conventional banking credit (LNLOAN) is using total credit issued by conventional banking in Rupiah. Interest rate is employing interest rate of Inter Bank Money Market (PUAB) for *all maturities* and Certificate of Central Bank. While profit sharing rate of financing is aggregately employ Bank Indonesia Sharia Certificate (SBIS) profit sharing rate and Sharia Inter Bank Money Market (PUAS) as a proxy.

III.2 Estimation Method

The problem put forward in this study would be analyzed using Vector Auto Regression (VAR). To simplify, VAR describes causational relationship among the variables within the model including *intercept*. This method was developed from the beginning by Sims in 1980 (Hasanah, 2007) which assumed that all variables within the model are endogen in nature so that it called by non-theoretical model.

If data are stasioner in first different, VAR model would be combined with error correction model to become *Vector Error Correction Model* (VECM). I*mpulse response function* (IRF) analysis would be applied to have a respond of endogen variable to a shock of other variables within the model. V*ariance decompositon* (FEVD) *analysis* also undertaken in this research to analyze relative contribution of a variable to explain the variability of its endogenous variables.

Source: Ascarya, *et al.* (2008)

Figure 3.1. The process of VAR analysis

IV. Analysis and Finding

IV.1 The Result of Unit Root Test

As what have been mentioned earlier, analysis method employed in the process of stationary test in this research is ADF (*Augmented Dickey Fuller*) test and Phillips-Perron test with 5 % level of significance. If t-ADF and t-PP result smaller than MacKinnon critical value, it can be concluded that data being used is stationer.

Table 4.1. The result of ADF and Phillips-Perron test

Variable	ADF		Phillips-Perron	
	Level	**1st Difference**	**Level**	**1st Difference**
CPI	-2.423450	**-5.663500**	-2.637343	**-5.871732**
LNFIN	-1.554025	**-2.680790**	-1.382850	**-6.400608**
LNLOAN	-1.673123	**-3.338888**	-2.010937	**-3.901421**
SBIS	**-4.108225**	**-11.59796**	**-3.878715**	**-14.40888**
SBI	-2.712136	**-3.341923**	-2.337240	**-3.289521**
PUAS	**-4.108077**	**-11.60642**	**-3.879208**	**-14.41468**
PUAB	-2.625126	**-8.228705**	-2.668365	**-8.222490**

Note: The Bold character indicates that data is stasioner in McKinnon critical value of 5%.

This unit roots test is undertaken in a *level* until *first difference.* In ADF test, there are variables being used in this research reach stationer in *level* that is Bank Indonesia Sharia Certificate (SBIS) and PUAS. The data are stationer at 5 % level of significance after having *first difference* so as in Phillips Perron test. Meaning that data being used in this research are integrated in the first different or can be shortened become I(1). The result of unit root test could be seen at table 4.1.

IV.2 Lag Optimum Determination

The test of *lag length optimum* is very useful in order to eliminate the problem of autocorrelation in VAR system. It is expected that once *lag optimum* employed there ill be no more autocorrelation problem. The determination of *lag* optimum being used in this research is base on the shorter *lag* using *Akaike Info Criterion* (AIC). The result shows that equation model having *lag* optimum at *lag* 2 (Table 4.2).

Table 4.2. The result of Lag Optimum Test

Lag	LogL	LR	FPE	AIC	SC	HQ
0	512.3337	NA	1.89e-15	-14.03705	-13.81570*	-13.94893
1	591.2005	140.2077	8.30e-16	-14.86668	-13.09594	-14.16174*
2	656.2443	102.9859*	5.51e-16*	**-15.31234***	-11.99220	-13.99058

Note: (*) indicate HQ is smallest among others

IV.3 The Result of VAR Stability Test

VAR stability test has to be undertaken before moving forward to the next analysis since if this VAR analysis which would be combined with error correction model (ECM) unstable, so Impulse Response Function and Variance Decomposition would become invalid (Setiawan, 2007). To ensure either stable or not the estimation of VAR that has been set up, so the verification of *VAR* stability condition in term of roots of characteristic polynomial has to be done. VAR system considered stable if all of it *roots* have a modus smaller than 1 (Gujarati, 2003). Base on VAR stability test, it can be concluded that VAR estimation that would be used for the interest of IRF and VD test is stable. After having a test, it could be concluded that VAR model being set up is stable at its *lag optimum*.

IV.4 The Result of Cointegration Test

The implementation of this test is in order to have long run relationship among the variables which has fulfilled some requirements during integration process whereby all variables are stationer in the same degree that is degree 1, I(1). Long run information is obtained by determine in the earlier step the cointegration rank in order to know how many equation system that could explain from the whole the existing systems. The result of cointegration test base on *trace statistics* indicates that there exist three *rank* of cointegration at 5 % level of significance.

Table 4.3. The Result of Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None *	0.585634	**189.0110**	**125.6154**	0.0000
At most 1 *	0.458349	**125.5786**	**95.75366**	0.0001
At most 2 *	0.405465	**81.43301**	**69.81889**	0.0045
At most 3	0.278737	43.99479	47.85613	0.1101
At most 4	0.170890	20.46870	29.79707	0.3916
At most 5	0.092292	6.975758	15.49471	0.5805
At most 6	5.25E-05	0.003783	3.841466	0.9497

IV.5 *Impulse Response Function Analysis*

Having series pre-estimation test, that is unit root test, optimum lag determination, VAR stability test up to cointegration test and in fact there exist two rank of cointegration at 5 % level of significance in this model, so the analysis would be proceeded to next VECM estimation. VECM estimation undertakes to see long term and short term analysis. The following is presented the simulation of *Impulse Response* analysis. The summary of Impulse Response Function (IRF) analysis result for transmission model in Indonesia dual monetary system could be seen at table 4.4. below.
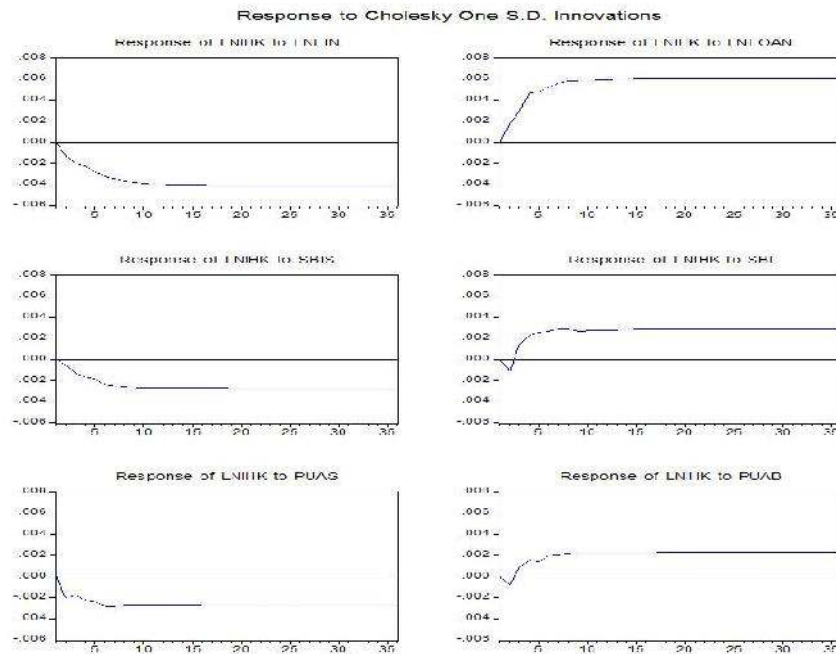
Table 4.4. The Respond of Consumer Price Index

Variable Shock	CPI/LNIHK Respond
LNFIN	Negative and permanent -0.004, starts stable at 16 period
LNLOAN	Positive and permanent 0.006, starts stable at 15 period
SBIS	Negative and permanent -0.003, start stable at 18 period
SBI	Positive and permanent 0.003, starts stable at 15 period
PUAS	Negative and permanent -0.003, starts stable at 16 period
PUAB	Positive and permanent 0.002, start stable at 17 period

Table 4.4. above indicates that the respond of Consumer Price Index (CPI/LNIHK) as inflation rate to the shock of other variables is fluctuated. We could critically analyze that CPI gives **negative** respond of 0.4 percent to the shock of Sharia Banking Financing (LNFIN) with one standard deviation. This figure indicates that the more the total of Indonesia sharia banking financing supplied to the demand side, the more it will potentially affect and contribute positively to the decrease of Indonesia inflation rate. This result could be a proof and a counter to what have found in the similar research undertaken by Hardianto in 2004. The reason that sharia financing will potentially decrease inflation rate is because sharia banking financing especially on productive financing with profit and loss sharing scheme would lead to the balanced growth between monetary and real sector economy. Islamic principle of profit and loss sharing is another important instrument of financial stability (Alaroo and Hakeem, 2011). Hence, this result also consistent with many studies [Sukmana and Kassim (2010) and Hasin and Majid (2011)] where Islamic deposit and financing are shown to be statistically significant in linking the monetary policy indicator to the real output.

Meanwhile, relationship pattern between CPI and LNLOAN is **positive**. It could be stated that the more credit fund disbursed by the conventional banking industry to the demand side, the more it will affect high inflation. The same reason would also happen to other conventional monetary instrument that is SBI and PUAB. In fact, these conclusions are identical with the research undertaken by Ascarya (2009). According to his finding, interest rate instrument represented by SBI is the main

determinant factor of inflation in Indonesia. Interest rate is the highest inflation factor compare to other variables within the model.

If looking at other result of impulse response function (IRF), the shock of SBI variable is responded negatively by sharia banking financing. Meaning which that an increase of SBI would lead to the decrease of sharia financing. The reason is, when monetary authority increase SBI interest rate, it will stimulate conventional banking industry to increase their interest rate either loan, saving as well as deposit interest rate. This situation would lead to the decrease of sharia banking competitiveness. Hence, *Return* sharing of sharia banking does not competitive compare to saving and deposit interest of conventional banking. At the end of the day, the last implication that might be faced by sharia banking is the possibility of being unmarketable and diminished their third party fund as well as its total financing.

Picture 4.1. Respond CPI/LNIHK to the Monetary Instruments

Consumer Price Index (CPI/LNIHK) variable could reach stability with respond to the LNFIN shock after 16 period and start to be stable with respond to the LNLOAN shock at 15 period. While the shock of Bank Indonesia Sharia Certificate (SBIS) and Sharia Inter Bank Money Market (PUAS) start stable responded at 18 and 16 period. Bank Indonesia Sharia Certificate (SBIS) and Inter Bank Money Market (PUAB) positively responded by CPI/LNIHK and starting to be stable at 15 and 17 period.

IV.6 *Variance Decomposition Analysis*

Having an analysis of dynamic behavior through impulse response, the next analysis would look at the model character using variance decomposition. As seen in picture 4.2., the fluctuation of Consumer Price Index (CPI/LNIHK) is dominantly influenced by CPI/LNIHK itself, LNLOAN in the second order starting from 3 period until 36 period, while LNFIN in the third order. SBI, PUAS and Bank Indonesia Sharia Certificate (SBIS) with 3 percent contribution where PUAB is the smallest among others and do not influence CPI/LNIHK.

In the first period, Consumer Price Index fluctuation (CPI/LNIHK) is influenced by the shock of CPI/LNIHK itself by 100 percent. At the estimation interval in the next periods, the shock of CPI/LNIHK itself start to decrease permanently in influencing consumer price index but still dominant compare to others while LNLOAN start to have a significance role at the second place. At the 36 period, the variability of consumer price index could be explained by LNLOAN, PUAB and SBI (conventional instrument) with total contribution **20.6 percent**. While at the same period, LNFIN, PUAS and Bank Indonesia Sharia Certificate (SBIS) only contribute **12.9 percent to** the variability of consumer price index CPI/LNIHK.
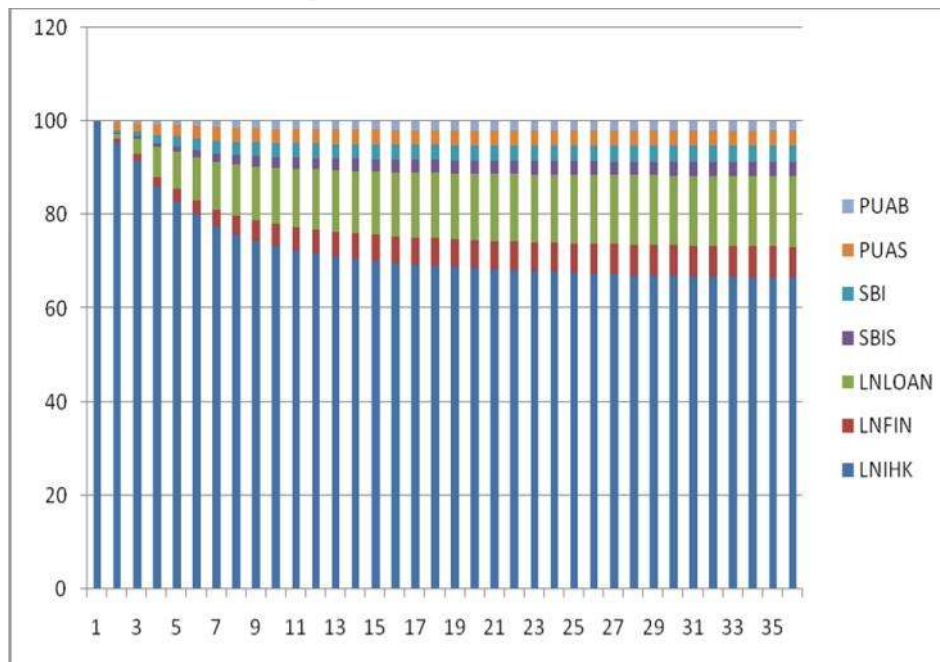

Figure 4.2. *Variance Decomposition* of Consumer Price Index (CPI/LNIHK)

Average contribution of CPI/LNIHK innovation in explaining the variability of consumer price index from the 20 period until the 36 period is 67 percent.

V. CONCLUSION AND RECOMENDATION

V.1 Conclusion

There are some conclusions that could be summarized from this research:

- Looking at variance decomposition, variables within the model that contribute sequentially to consumer price index are: conventional banking credit/LNLOAN (15.1%), sharia banking financing/LNFIN (6.7%), SBI (3.4%), PUAS (3.2%) SBIS (3%) and PUAB (2.1%). This result indicates that conventional monetary instruments –LNLOAN, SBI and PUAB- contribute more (20.6 persent) to inflation (CPI/LNIHK) compare to sharia instrument (LNFIN, SBIS and PUAS with only 12.9 percent). It is natural and can be understood since market share of conventional banking is more than sharia banking. Whereby, market share of sharia banking is only 2 % to the total national banking industry.

- Impulse response function (IRF) analysis result indicates that LNIHK **negatively** responds the shock of sharia banking financing (LNFIN). Meaning that the more Indonesia sharia banking financing the more it will influence and contribute positively to the decrease of Indonesia inflation rate. The reason that sharia financing will potentially decrease inflation rate is because sharia banking financing especially on productive financing with profit and loss sharing scheme would lead to the balanced growth between monetary and real sector economy. Islamic principle of profit and loss sharing is another important instrument of financial stability (Alaroo and Hakeem, 2011). Hence, this result also consistent with many studies [Sukmana and Kassim (2010) and Hasin and Majid (2011)] where Islamic deposit and financing are shown to be statistically significant in linking the monetary policy indicator to the real output.

- Relationship pattern between CPI/LNIHK and LNLOAN is **positive**. It means that the more credit fund disbursed by the conventional banking industry to the demand side, the more it will affect high inflation. The same reason would also happen to other conventional monetary instrument that is SBI and PUAB. In fact, these conclusions are identical with the research undertaken by Ascarya (2009) which stated that interest rate instrument which represented by SBI was the main determinant factor of Indonesia inflation.

- From the six variables within the model that represent sharia monetary instrument (LNFIN, SBIS dan PUAS) and conventional one (LNLOAN, SBI dan PUAB), there exist their pattern relationship with Consumer Price Index (CPI/LNIHK) which interesting to be analyzed. All of sharia monetary instruments were **negatively** responded by CPI/LNIHK, while it responded the entire conventional monetary instrument **positively.** It could be concluded that conventional monetary instrument tend to rise the inflation whereby on the contrary sharia monetary instruments could reduce Indonesia inflation rate.

- From impulse response function (IRF) result test, we can see that the shock in SBI was negatively responded by sharia banking financing. Meaning which that increasingly SBI would lead to the decrease of sharia financing. The reason is, when monetary authority increase SBI interest rate, it will stimulate conventional banking industry to increase their interest rate either loan, saving as well as deposit interest rate. This situation eventually would lead to the decrease of sharia banking competitiveness. Hence, since interest is pre-determined in nature, *return* sharing of sharia banking does not competitive compare to saving and deposit interest of conventional banking. At the end of the day, the last implication that might be faced by sharia banking is the possibility of being unmarketable and diminished their third party fund as well as total financing.

V.2 Recommendations

Having conclusions as stated above, writer is trying to address several recommendations.

- The conclusion in this research could be stated that the more Indonesia sharia banking financing disbursed to the demand side, the more it will influence and contribute positively to the decrease of Indonesia inflation rate. It is urged in such a away for authority to have a good will to develop market share of sharia banking in Indonesia in order to manage and control inflation as well as its negative effects.

- It is found in this research that conventional monetary instrument that is banking credit (LNLOAN), SBI and Inter Bank Money Market (PUAB) are tend to raise inflation rate. It is for such reason, there need a critical review the effectiveness of those instruments in order to reach economic stability as well as to have a balanced between monetary sector and real one.

- Government or monetary authority should have serious effort to develop banking industry with interest free system, one way out that might put forward is how to reduce SBI interest rate as low as possible (to not saying zero interest). This also implies that ensuring the stability of the Islamic financial instruments is as important as that of conventional one to achieve an effective transmission mechanism of monetary policy in the economy.

- There should exist some limitations in this research. It should be another channel in Indonesia sharia monetary transmission so that will come up with more comprehensive discussion. Hence, it is important also to include equivalent rate of sharia banking profit sharing which can be compared with that of conventional banking credit interest rate so that there will be a clearer picture of Indonesia monetary transmission with its dual monetary system.

References

Alaro, Abdul-Razzaq A, and Mobolaji Hakeem, Financial Engineering and Financial Stability; The Role of Islamic Financial System". Journal of Islamic Economics, Banking and Finance, Vol. 7 No. 1, Jan-Mar 2011.

Ascarya, Heni Hasanah, and N. Achsani, "Permintaan Uang dan Stabilitas Moneter dalam Sistem Keuangan Ganda di Indonesia", Paper presented at Seminar dan Kolokium Nasional Sistem Keuangan Islam II , Bandung, Indonesia, 6 September 2008.

Ascarya, "The Determinants of Inflation Under Dual Monetary System in Indonesia", Center for Central Banking Education and Studies, Bank Indonesia (2009).

Azali M. "Transmission Mechanism in a Developing Economy: Does Money or Credit Matter?, 2nd edition. Serdang: University Putra Malaysia Press, 2003.

Gujarati, Damodar. Basic Econometric. Jakarta: Erlangga, 2003.

Hardianto, Erwin. "Shariah Transmission Mechanism in Indonesia". Paper, 2004.

Hasanah, Heni. "Stabilitas Moneter pada Sistem Perbankan Ganda di Indonesia". Bogor Agriculture University: Faculty of Economic and Management, 2007.

Hasin, Zamrah and M. Shabri Abd. Majid. "The Importance of the Islamic Banks in the Monetary Transmission Mechanism in Malaysia". The Paper presented at Eighth International Conference on Islamic Economics and Finance - Sustainable Growth and Inclusive Economic Development from an Islamic Perspective, Doha Qatar, 19-21 Decem ber 2011.

Ibrahim, M. H. "Sectoral Effect of Monetary Policy: Evidence from Malaysia." Asian Economic Journal, Vol. 19 No. 1 (2005).

Kassim, S. H. "The Role of Bank Lending in the Monetary Transmission Process of A Developing Economy: Evidence from Malaysia." Saving and Development, Vol. 33 No 4. (2008).

Mankiw, N. Gregory. Macroeconomic Theory 5th Edition. Jakarta: Penerbit Erlangga, 2003.

Sanrego, Yulizar Djamaluddin & Khulailatun Nikmawati. "Transmission Mechanism of Sharia Financing in Malaysia". The Journal of Muamalat & Islamic Finance Research (JMIFR), Vol. 7 No 1. (2010).

Sukmana, Raditya and Salina H. Kassim. "Roles of the Islamic Banks in the Monetary Transmission in Malaysia". International Journal of Islamic and Middle Eastern Finance and Management, Vol. 3Iss: 1, (2010)

Pohan, Aulia. Monetary Policy Framework and its Implementation in Indonesia. Jakarta: PT Raja Grafindo Persada, 2008.

Setiawan, Hapid. "Determinant Factor of Inflation in Indonesia and its Solutions from Islamic Economics Perspective". Bogor: Islamic Economics Department, Tazkia Islamic Business School, 2007.

Tang, T. C. "Bank Lending and Economic Growth in Malaysia: Revisited", Jurnal Analisis, Vol. 10 No. 1 (2002).

Warjiyo, Perry and Solikin. Monetary Policy in Indonesia, Series Book No 6, Center for Central Banking Education and Studies, Bank Indonesia, 2003.