

DYNAMIC ANALYSIS OF ISLAMIC AND CONVENTIONAL MONETARY INSTRUMENTS TOWARDS REAL SECTOR GROWTH IN INDONESIA

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Abstrak

Saat ini *fiat money*, *interest rate*, dan *fractional reserve banking system* telah digunakan sebagai instrumen utama dalam sistem moneter di seluruh dunia. Namun, sejumlah pakar melihat bahwa ketiga alat tersebut adalah akar dari rentannya sistem ekonomi secara keseluruhan, sehingga begitu banyak krisis terjadi dan terjadi lagi, dan terjadi ketidakseimbangan yang besar antara sektor moneter dan sektor riil dalam abad-abad terakhir ini. Di sisi lain, sistem moneter syariah menawarkan instrumen yang lebih adil dan wajar, yaitu *real money*, *profit and loss sharing*, dan *full reserve banking system*, karena dapat menjembatani sektor moneter dan sektor riil secara sempurna.

Tulisan ini bertujuan melihat perbandingan efek dari instrumen moneter syariah dan konvensional ke arah pertumbuhan sektor riil, dengan mengambil studi kasus Indonesia dari Januari 2004 sampai Desember 2010. *Industrial Production Index* (IPI) digunakan sebagai proksi pertumbuhan sektor riil. *Exchange rate* (ER), *working capital interest rate* (R_{WK}), dan *quasi money* (QM) digunakan untuk merepresentasikan instrumen moneter konvensional. Sebaliknya, *gold price index* (GOLD), *mudharabah investment deposits rate* (R_{MID}), dan *base money* (M0) adalah representasi dari instrumen moneter syariah. Hasil penelitian menunjukkan bahwa instrumen moneter syariah lebih stabil daripada instrumen moneter konvensional dalam merespon *shock of exogenous variables*.

Kata kunci: Instrumen Moneter Syariah dan Konvensional, Pertumbuhan Sektor Riil

Abstract

Currently, *fiat money*, *interest rate*, and *fractional reserve banking system* have been employed as main instruments in the monetary system all over the world. However, some scholars believe that these three tools are the roots of vulnerability in the economy system as a whole, resulting so many crises occurred over and over again and huge imbalance between monetary and real sector for last centuries. On the other side, Islamic monetary system offers more just and fair instruments, namely *real money*, *profit and loss sharing*, and

full reserve banking system because those can bridge the monetary and real sector perfectly.

This paper hence attempts to see the effects of Islamic monetary instruments and its conventional counterpart towards real sector growth by taking case study of Indonesia from January 2004 to December 2010. Industrial Production Index (IPI) is utilized as the proxy of real sector growth. Exchange rate (ER), working capital interest rate (R_WK), and quasi money (QM) are used to represent the conventional monetary instruments. Contrary, gold price index (GOLD), mudharabah investment deposits rate (R_MID), and base money (M0) are the representation of Islamic monetary instruments. This finding shows that Islamic monetary instrument is more stable than conventional monetary instrument in responding the shock of exogenous variables.

Keywords: Islamic and Conventional Monetary Instruments, Real Sector Growth

I. INTRODUCTION

1.1. Background

In the global current system, there are three major instruments that have become the soul of the economy namely fiat money, interest rate, and fractional reserve banking system. These three elements have caused instability and inequity towards the economy due to their nature to create a huge imbalance between the monetary sector and the real sector respectively.

Under fiat money system, money can be created out of nothing, causing the money grows exponentially that cannot be met by the real output because the latter can only rise linearly. This money creation will be only beneficial for the first party who use it. As a consequence, the money growth is afterwards transferred to the increase in price level that should be faced by all people. On the other words, fiat money can cause inflation that reduces most people's income purchasing power.

In addition, interest rate also plays a significant contribution to the vulnerability of the economic system. Interest rate forces an endless economic growth, because the return required by interest rate does not exist in the form of money. No matter how hard people put an effort to repay the interest, in aggregate some party must default because the system is designed to be that way (Meera, 2004). Consequently, socio-economic life of most people must suffer a lot due to this system.

This condition is worsening by the fractional reserve banking system that allows money creation through multiple credit creation. Through this scheme, money is injected into the economy by the commercial bank using the mere accounting system, regardless the real sector ability to return that amount of money. It, again, can cause an imbalance between monetary and real sector resulting inflation in the economy. Meera (2004) explains this problem by employing the equation of exchange. When money supply increases through multiple credit creation that is not corresponding with the growth of good and services in the economy, price level will surely rise. Regarding the imbalance between monetary and real sector is illustrated in the Table 1. From the table, we can see that the world money supply is nearly 5.5 times larger than the real economy (Howard, 2011).

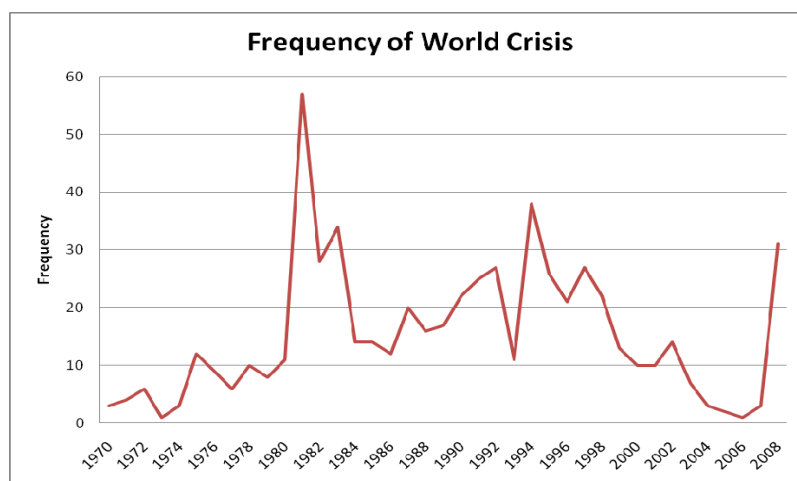
Table 1. World Money Supply and GDP

World Money Supply	USD Trillion
Narrow Money	22
Broad Money	75
Domestic Credit	105
External Debt	60
Foreign Exchange Reserves	10
Total Fiat Money Base	272
World GDP	50
Ratio of Fiat Money to GDP	5.4: 1

Source: Howard (2011)

As a result, under conventional system, there has been hundred crises occurred in the world. Leaven and Valencia as cited in Ascarya (2009) reported that in the period of 1970-2007, there have been 395 incidents of financial crises, i.e. banking crisis, currency crisis, and sovereign debt crisis, involving 42 twin crises and 10 triple crises (vide Figure 1).

However, Islam has offered more just and stable system towards economy. Islamic economic system has addressed the problems that occur in the current economic system. This is because the instruments used in the system can reduce the risk that a scourge of the problem of chaos in the monetary system and difficult signals to pass through a revolving fund monetary sector into the real sector, namely real money, full reserve banking system, and profit and loss sharing. With the signals to pass through funds from the monetary sector to the real sector, then this will maintain price stability and to increase productivity and employment opportunities so as to reduce the level of unemployment and poverty which in turn will create a welfare society.



Source: Ascarya (2009)

Figure 1. Frequency of the World Crisis

Furthermore, when Islamic economics views money as medium of exchange, it represents purchasing power, which is considered as the only proper use of money. This purchasing power (money) cannot be used to make more purchasing power (money) without

undergoing the intermediate step, i.e. being used for the purchase of goods and services. Muslim jurists consider money as potential capital rather than capital. Money becomes capital only when it is invested in a business. Thus, Islamic financial institutions should encourage transfer of funds to be invested in the real sector.

On the other side, the prohibition of interest rate is due to its nature similarity with *riba* for it requires additional percentage of the principle unilaterally in the initial contract, regardless the condition of the borrowers. Therefore, profit rate is utilized to replace the use of interest rate in the Islamic banking system as an intermediary instrument.

This study, thus, attempts to see the effects of Islamic and conventional monetary instruments towards real sector growth by taking case study of Indonesia. This paper comprises five sections including introduction in the first one. Section two will depict the literature review and will be followed by the methodology in the next section. Finding and analysis will be explained in the forth section. Finally, section five concludes this study.

1.2. Research Statement

According to the background in the previous subsection, this study will analyze the detailed response of the real growth under dual monetary system in Indonesia. There are two major questions that will be determined in this study, namely:

1. What is the influence of Islamic and conventional monetary instrument towards real sector growth?
2. Under dual monetary system, which system that results more stable response of the real sector?

1.3. Objectives and Contribution

The very objective of this study is to see the effect of monetary instruments under dual banking system towards the real sector of the country. By conducting this research, we can figure out the comparison between the two systems and their consequences to the economy.

This study hopefully can be beneficial for the banking and financial sector, notably the Islamic bank, in order to give some suggestion to improve their performance towards the economy. Besides, this study can also be useful for the government to make a wholesome policy regarding the monetary system in Indonesia. This is because without the support from the government, the realization of a good monetary system will be hard to attain. Expectantly this research will give a real contribution for the effort of betterment economic system in Indonesia.

1.4. Scope of the Study

This study will take case of Indonesian economy from January 2004 to December 2010. It will then focus on the effect of instruments of dual monetary system towards real sector growth that is represented by Industrial Production Index (IPI).

II. LITERATURE REVIEW

Industrial Production Index (IPI) has been a very important macroeconomic indicator to monitor progress and fluctuation of industrial sectors in the Indonesia economy (Rosidi, 2000). Industrial Production Index is employed as the proxy to income, a major macroeconomic indicator potentially affecting Islamic banking growth. The index is commonly used as proxy for economic activity or national

income primarily due to the unavailability of real GDP or GNP measured on monthly basis (Kasri and Kassim, 2009).

The stabilization of real sector or Gross Domestic Product (GDP) depends on the capacity of the country to achieve stable growth and to avoid recession in the economy. The Asian crisis in 1997 had negative impact to the GDP as describe in the table below. All the countries face negative GDP after the crisis in 1998 as illustrated in Table 2.

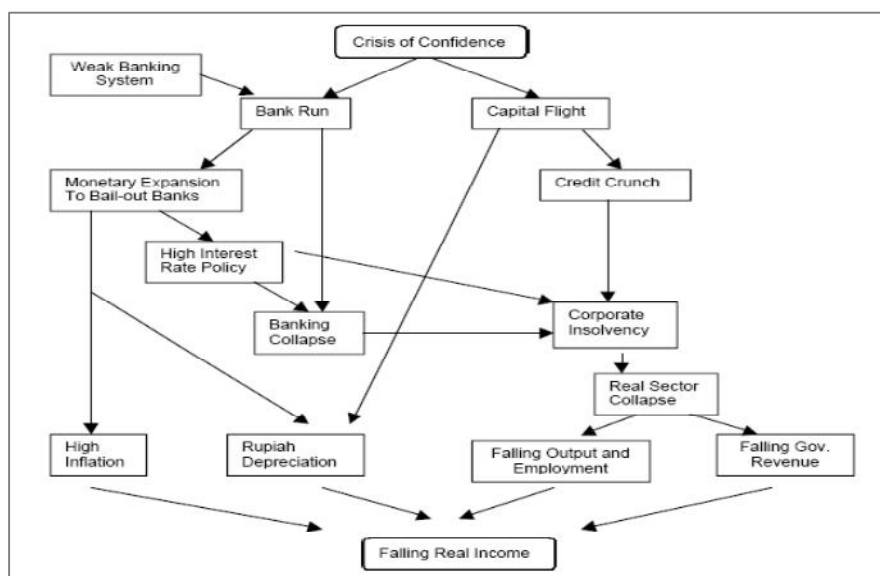
Table 2. GDP annual change, selected Asian economies, 1995-2000 (%).

Countries	1995	1996	1997	1998	1999	2000
Indonesia	8.2	7.8	4.7	-13.1	0.8	5.4
Republic of Korea	9.2	7.0	4.7	-6.9	9.5	8.5
Malaysia	9.8	10.0	7.3	-7.4	6.1	8.7
Philippines	4.7	5.8	5.2	-0.6	3.4	6.0
Thailand	9.2	5.9	-1.4	-10.5	4.4	4.8

Source: IMF 2009. World Economic Outlook Database (2009)

Financial crisis that occurred in 1998 had given a bad impact to the real sector. It was actually mainly caused by the current monetary system. This condition had brought to the increasing of unemployment, bankruptcies and social gap. The worst implication of this system is the appearance of speculation towards a great amount of national currencies.

According to Chapra (1992), optimum real rate of economic growth is the most important of which in the field of economics, beside general need fulfillment, equitable distribution of income and wealth, full employment and economic stability. For Indonesian case, the central bank seemed to utilize BI rate very much to respond the excessive monetary expansion due to the over printing of new money after crisis. Feridhanusetyawan (1999) describe the Indonesian crisis by below scheme.



Source: Feridhanusetyawan (1999)

Figure 2. From the Crisis of Confidence to Economic Collapse

As we can see, nowadays all nation currencies are fiat such as paper money and electronic money. Based on Meera (2004), the nature of money in the contemporary monetary system is fiat money, fractional reserve requirement, and interest rate. He argues that the fiat money is necessary condition for money creation.

Fiat money is the main factor/actor behind money creation as have been stated by Meera (2004) as cited in Obaidullah (2004):

The growth in money supply even though after the potential GDP has been achieved can cause falling interest due to excess money supply in the economy. By the reverse process of money creation, NPL's destroy the money supply through a multiplier effect and thus further shrink the money base and loan able funds. Bank may respond by confiscating collaterals and calling for early repayment loans. Business may start retrenching workers to save cash flow for debt service. This transfer was originally a problem in financial sector to the real sector of the economy. Retrenchment would contract aggregate demand and shrink the economy through a multiplier effect, causing further unemployment, business failures, etc.

Chapra (1996) explains continual instability of currency exchange rate may stimulate speculation and enigma either for the market or effective policy making. This is because it will mislead the traders to predict the market mapping both local and abroad. Thus, to recover financial and budget policy, all countries should consider a fixed regulation. In addition, he also states that uncontrolled budgetary transaction creates the excessive flow of uninventive money in which to boost the interest rate frequently that discourages productive investment.

For further situation, if the real sector not stable, it means that many people cannot fulfill their needs. This condition create the poverty level will be ascended; and this poverty according to Meera and Larbani (2006) leads to the undetermined of other *Maqasid al-shari'ah* such as protection of the faith, wealth, life, intellect, and progeny.

Therefore, some scholars come up with an idea about gold. Both from western as Robert Mundell, Ernest Hemingway, Alan Greenspan, JP Morgan in Nathan (2007) and Muslim scholars as Umar Vadillo, Tareq El Diwany, Ahamed Kamil Mydeen Meera, Aziudin Ahmad and Saiful Azhar Rosly. Most of them agree that the gold is a currency that has a stable value.

Nathan (2007) views that gold is the best system since it is the one that always maintains the greatest stability of currency value, over a week, year, decade or century. By gold standard system, there will be no money creation (Meera, 2004). Furthermore, Rosly (2005) argue that gold standard is needed to determine the supply of money based on the amount of gold reserves in the central bank. Howard (2011) concludes gold base financial supply promotes to the strength of factual economic improvement as it eradicates the corruption, fluctuation and stagnation of economic growth.

Beside gold standard, as a quantitative control of bank credit, Chapra (1996) encourage commercial bank to increase the profit sharing ratio for *mudharabah* in their products. There are some efforts about the economic implication of the profit loss sharing system. Mohsin Khans and Zubair Hasan as cited in Rosly (2005) state about mathematical approach to explain the advantage of profit loss sharing in the banking system liability management and how the profit rate in the profit loss sharing financial system is determined.

Mudharabah has to become a niche product when Muslim practitioners and Islamic share-holders put their will power and determination on trial. Otherwise, Rosly (2005) said that the business will soon end up converging with conventional practices, thus losing the Islamic identity.

An extended (empirical and theoretical) literature is still going through. Empirical results by Ascarya (2009) indicate that Islamic monetary instrument contributed to prevent inflation. His research prove if the main three conventional sources of inflation which are excess money supply, interest and exchange rate, were replaced by their Islamic counterparts, such as just money supply, PLS and single global currency, the rate of inflation drops significantly.

III. METHODOLOGY

3.1. Sources of Data

This research utilizes monthly data that is taken from various secondary sources including Indonesia's Economic and Financial Statistic of Bank Indonesia (SEKI-BI) and CEIC Asia Data Base from January 2004 until December 2010. All data are transformed into natural logarithms except the rate of working capital credit and *mudharabah* investment deposit

Table 3. Variables and Sources of the Data

No.	Variable		Sources
1.	Industrial Production Index	<i>ipi</i>	CEIC Asia Database
2.	Nominal Exchange Rate	<i>Er</i>	Central Bank of Indonesia
3.	Gold Price Index	<i>gold</i>	Central Bank of Indonesia
4.	Base Money	<i>mo</i>	Central Bank of Indonesia
5.	Quasi Money	<i>qm</i>	Central Bank of Indonesia
6.	Working Capital Credit Rate	<i>r_wk</i>	Central Bank of Indonesia
7.	Mudharabah Investment Deposit	<i>r_mid</i>	Central Bank of Indonesia

Source: Authors' Own

3.2. Model and Variables

Below are the general models that are going to be analysed in this study.

Conventional side:

$$\begin{bmatrix} ipi_t \\ er_t \\ qm_t \\ r_wk_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \\ c_4 \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} & \alpha_{14} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} & \alpha_{24} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} & \alpha_{34} \\ \alpha_{41} & \alpha_{42} & \alpha_{43} & \alpha_{44} \end{bmatrix} \begin{bmatrix} ipi_{t-n} \\ er_{t-n} \\ qm_{t-n} \\ r_wk_{t-n} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1u} \\ \varepsilon_{2u} \\ \varepsilon_{3u} \\ \varepsilon_{4u} \end{bmatrix}$$

Islamic side:

$$\begin{bmatrix} ipi_t \\ gold_t \\ mo_t \\ r_mid_t \end{bmatrix} = \begin{bmatrix} c_1 \\ c_2 \\ c_3 \\ c_4 \end{bmatrix} + \begin{bmatrix} \alpha_{11} & \alpha_{12} & \alpha_{13} & \alpha_{14} \\ \alpha_{21} & \alpha_{22} & \alpha_{23} & \alpha_{24} \\ \alpha_{31} & \alpha_{32} & \alpha_{33} & \alpha_{34} \\ \alpha_{41} & \alpha_{42} & \alpha_{43} & \alpha_{44} \end{bmatrix} \begin{bmatrix} ipi_{t-n} \\ gold_{t-n} \\ mo_{t-n} \\ r_mid_{t-n} \end{bmatrix} + \begin{bmatrix} \varepsilon_{1u} \\ \varepsilon_{2u} \\ \varepsilon_{3u} \\ \varepsilon_{4u} \end{bmatrix}$$

where:

- ipi* = natural logarithm of industrial production index
- er* = natural logarithm of nominal exchange rate
- gold* = natural logarithm of gold index
- mo* = natural logarithm of base money
- qm* = natural logarithm of quasi money
- r_wk* = working capital credit rate
- r_mid* = *mudharabah* investment deposit rate
- c_i* = intercept; *i*(1,2,...)
- α_{ij}* = lag operator; *i,j*(1,2,...)
- ε_{iu}* = error term; *i*(1,2,...)

According to the two models above, variables that are used by this study are as below and the source shown in the Table 1:

- a. IPI: Industrial Production Index, which is used as proxy for real sector economic growth.
- b. ER: Multiple currencies system or nominal exchange rate of Rupiah to the US Dollar.
- c. GOLD: International gold price index.
- d. M0: Base money, which represents the just money supply or exact money needed in the real sector in Islamic perspective.
- e. QM: Quasi money, which represents excess money supply and credit creation or fiat money.
- f. R_WK: Interest rate of working capital loan of conventional bank.
- g. R_MID: Returns of investment from Islamic bank represented by equivalent rate from the actual returns of *Mudharabah* investment deposits.

3.3. Empirical Framework

This study employs time series analysis that is based on Vector Auto Regression and Vector Error Correction Model (VAR/VECM). Studies on VAR models usually employ variables in log form. However, one should also be cautious if the variables measured are non-stationary. It is because non-stationary variables may yield the spurious regression (Gujarati, 2003). Thus, if the variables are found to be non-stationary and non-cointegrated, the use of VAR model in the first difference is suggested.

3.3.1. Unit Root and Cointegration Tests

The first step in this study is to determine stationarity of variables of the models. Briefly stated, classical regression techniques may be invalid if applied to variables that do not meet the stationarity property (Thomas, 1997). This paper uses the most commonly used test, which is Augmented Dickey Fuller (ADF) test. It is "augmenting" a random walk with drift around a stochastic trend by adding the lagged values of the dependent variable ΔY_t (Gujarati, 2003). The test will be based on following model:

$$\Delta Y_t = \beta_1 + \beta_2 t + \delta Y_{t-1} + \alpha_i \sum_{i=1}^m Y_{t-1} + \varepsilon_t$$

Where β_1 and β_2 are parameters, t is the time or trend variable, δ represents drift, ε_t is a pure white noise error term and $\Delta Y_{t-1} = (Y_{t-1} - Y_{t-2})$, $\Delta Y_{t-2} = (Y_{t-2} - Y_{t-3})$, etc. If the null hypothesis exists, i.e. $\delta = 0$; then there is a unit root. Hence, the time series is non-stationary. If the alternative hypothesis exists, i.e. δ is less than zero, then the time series is stationary.

The next step is to test cointegration. It aims at determining whether or not the non-stationary variables are cointegrated, i.e. they share a long run and stable relationship. In order to achieve this objective, Johansen and Johansen-Juselius tests are employed. The test is run under the following form:

$$\Delta Y_t = \beta_0 + \pi Y_{t-1} + \sum_{i=1}^p \Gamma_i \Delta Y_{t-1} + \varepsilon_t$$

Cointegration exists if trace statistics is greater than the critical values. After we know the number of cointegration equations, then we can proceed to the VECM analysis.

3.3.2. Vector Error Correction Model (VECM)

This method is used when variables of the research are cointegrated at the first difference. VECM approach according to Masih and Masih (1997) as cited in Gujarati (2003) allows us to distinguish between "short term" and "long term" dynamic within a long run equilibrium. In general, this method is based on the following formula:

$$\Delta Y_t = \sum_{i=1}^{k-1} \Gamma_i \Delta Y_{t-1} + \mu_0 + \mu_1 t + \alpha \beta Y_{t-1} + \varepsilon_t$$

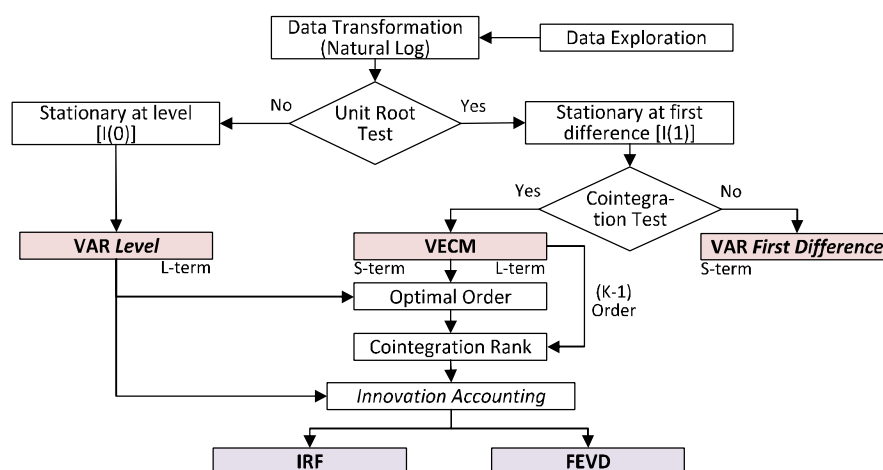
Where:

- ΔY_t = $Y_t - Y_{t-1}$
- K-1 = Order of VECM from VAR
- Γ_i = Regression coefficient matrix (b_1, \dots, b_i),
- μ_0 = Intercept vector
- μ_1 = Regression coefficient vector
- T = Time trend
- α = Loading matrix
- β = Cointegration vector
- Y = Variables used in the analysis

3.3.3. Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD)

Impulse Response Function (IRF) is a method that is used to determine the response of an endogenous variable on a certain shock, because this shock maybe transmitted to the other dependent variables through a dynamic structure or lag structure in the VAR model. IRF essentially maps out the dynamic response path of a variable due to a one-period standard deviation shock to another variable.

Furthermore, Forecast Error Variance Decomposition (FEVD) is used to examine how the change in a variable – which is shown by error-variance changes – is affected by other variables. Through this method, strength and weakness of a variable in influencing other variables in the long run can be analysed. The summary of the flowchart methodology used in this paper can be shown in the Figure 3 below.



Source: Ascarya (2009)

Figure 3. The Process of VAR Analysis

IV. FINDING AND ANALYSIS

4.1. Test of Stationarity

Unit root test is one crucial step to check whether one variable has unit root or not. By using ADF test, we check the data stationarity in the level condition. If data is not stationary in level, we have to conduct the second ADF test by using data in the first difference condition. One variable is considered as stationary variable if the absolute value of ADF statistic is greater than absolute value of MacKinnon critical value. In this study, the authors use 90% confidence interval. The result of stationarity test on level and first difference condition are respectively illustrated in the Table 4 and 5.

Table 4. Unit Root Test on Level

Variable	ADF Statistic	Mackinnon Critical Value			Description
		1%	5%	10%	
Ln_IPI	-2.287147	-3.514426	-2.898145	-2.586351	Not Stationary
Ln_ER	-2.856659	-3.514426	-2.898145	-2.586351	Stationary
Ln_GOLD	-1.525822	-3.514426	-2.898145	-2.586351	Not Stationary
Ln_QM	0.910080	-3.514426	-2.898145	-2.586351	Not Stationary
Ln_M0	-0.510331	-3.514426	-2.898145	-2.586351	Not Stationary
R_WK	-1.903880	-3.514426	-2.898145	-2.586351	Not Stationary
R_MID	-1.915846	-3.514426	-2.898145	-2.586351	Not Stationary

Source: Authors' Own

Based on the Table 4, it can be concluded that among the seven variables, exchange rate is the only variable that stationary in level. Therefore, the second step must be conducted for the variables that are not stationary in the level. After changing the data into the first difference condition, it is found that all remaining variables are stationary (vide Table 5).

Table 5. Unit Root Test on 1st Difference

Variable	ADF Statistic	Mackinnon Critical Value			Description
		1%	5%	10%	
Ln_IPI	-14.52665	-3.512290	-2.897223	-2.585861	Stationary
Ln_GOLD	-9.742035	-3.512290	-2.897223	-2.585861	Stationary
Ln_QM	-9.457933	-3.512290	-2.897223	-2.585861	Stationary
Ln_M0	-2.731809	-3.512290	-2.897223	-2.585861	Stationary
R_WK	-4.422320	-3.512290	-2.897223	-2.585861	Stationary
R_MID	-10.11924	-3.512290	-2.897223	-2.585861	Stationary

Source: Authors' Own

4.2. Lag Optimum Test

When all the variables are stationary in level or first difference, find the number of maximum lag where at that number Vector Autoregressive system will be stable. From the appendix 2 and 3, the maximum number of lag where the VAR system is stable can be found. After finding the maximum lag, by referring to one of the indicator (i.e. SC, AIC, LR, HQ, etc.) we may determine the number of optimum lag. This is really a crucial step, since in the simultaneous equation one variable is affected by the lag of its variable and by the lag of other variables. In this study, the authors refer to AIC where the number of optimum lag is **one** (vide Appendix 4 and 5).

4.3. Cointegration Test

When one or more variables in the system are not stationary but posses a cointegration relation, then the linear combination among the variables in the system will be stationary and form stable long run equilibrium. In this study, by using Johansen cointegration approach, the authors compare the value of trace statistic with the 5% critical value and it is found that for both models (i.e. Conventional and

Islamic) the number of cointegration equation in the long run is **one** (vide Table 6 and 7)

Table 6. Johansen Cointegration Test for Conventional

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.285179	49.56590	47.21	54.46
At most 1	0.139841	22.03662	29.68	35.65
At most 2	0.079421	9.684338	15.41	20.04
At most 3	0.034732	2.898679	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level.
 Trace test indicates **1 cointegrating** equation(s) at the 5% levels

Source: Authors' Own

Table 7. Johansen Cointegration Test for Islamic

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	5 Percent Critical Value	1 Percent Critical Value
None **	0.307323	55.86367	47.21	54.46
At most 1	0.258845	29.05867	29.68	35.65
At most 2	0.085714	7.191825	15.41	20.04
At most 3	0.008866	0.650128	3.76	6.65

*(**) denotes rejection of the hypothesis at the 5%(1%) level.
 Trace test indicates **1 cointegrating** equation(s) at both 5% and 1% levels

Source: Authors' Own

4.4. Vector Error Correction Analyses

VECM estimation yield information about speed of adjustment on the instability relationships from short-term to long-term equilibrium. Variables that are not stationary at level will be processed with testing the unit root in first difference level. However, the usage of first difference data can eliminate the long-term information in the study. Therefore, VECM will be used in order to anticipate a loss of long-term information as long as there is cointegration on the model. If t-trace statistics are greater than the Mackinnon critical value of 10 percent, it indicates that the explanatory variable is significantly affecting IPI.

The table below summarizes the result of long term conventional and Islamic model. From the regression of conventional model, there are two variables which are statistically significant influence real economy (IPI) in the long-term namely quasi money (QM) and working capital rate (R_WK), whilst the variable of exchange rate is not statistically significant. On the other hand, it can obviously be seen that real economy (IPI) is only significantly affected by base money (M0) and *mudharabah* investment deposits (R_MID) for the long term estimation of Islamic monetary instruments. Nonetheless, the gold price index (GOLD) can not significantly influence real economy (vide Table 8).

Table 8. VECM Estimated for Conventional and Islamic Model

Variable	Estimated Coefficient	T-Statistic
Long Term Conventional		
LN_ER(-1)	0.006864	0.07234
LN_QM(-1)	0.125295	5.43476*
R_WK(-1)	-0.020509	-3.70303*
C	3.299629	-
Long Term Islamic		
LN_GOLD(-1)	-0.051371	-1.49335
LN_M0(-1)	0.183645	5.84169*
R_MID(-1)	-0.023745	-2.22309*
C	3.068467	-

Note: * significant at 10% critical value
 Source: Authors' Own

4.5. Impulse Response Function (IRF)

The result of Impulse Response Function (IRF) of IPI on Islamic and conventional model can be compared in the Table 9 below. All instruments between conventional and Islamic instruments show the similar response. Specifically, if we compared from the period of stability on each instruments, the Islamic model is generally more stable than conventional model in responding the shock that occurs except for the variable of money supply.

Table 9. Impulse Response Function Summary

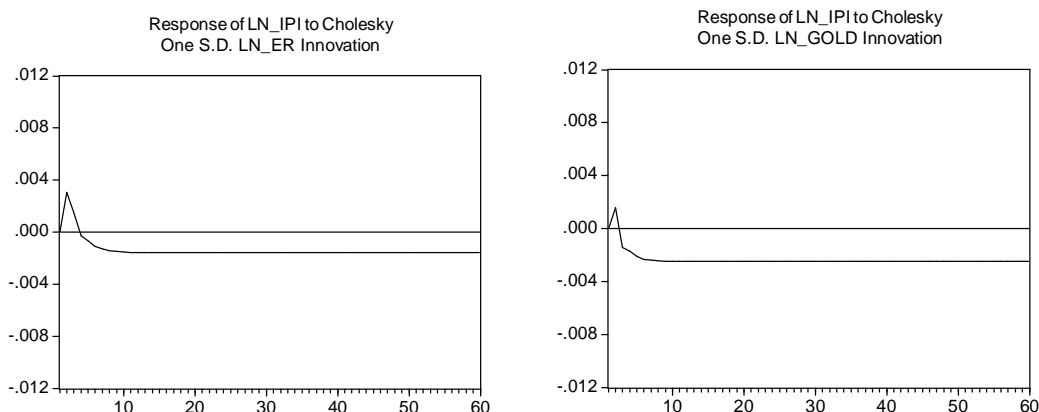
SHOCK	CONVENTIONAL	ISLAMIC	SHOCK
LN_ER Exchange Rate	Negative and permanent at 0.0015, stabilize from the period 17.	Negative and permanent at 0.0024, stabilize from the period 14.	LN_GOLD Single
LN_QM Fiat Money	Positive and permanent at 0.0004, stabilize from the period 14.	Positive and permanent at 0.0038, stabilize from the period 14.	LN_M0 Just Money
R_WK Interest Rate	Negative and permanent at 0.010, stabilize from the period 18.	Negative and permanent at 0.0074, stabilize from the period 15.	R_MID Mudharabah Return

Source: Author's Own

Figures 4 below compare the impact of multiple currencies and single global currency towards the IPI. It clearly shows that one standard deviation shock of exchange rate and gold price will be responded negatively by real output in the long term. The increase in gold price and exchange rate leads to a decrease on real economy. Yusuf, et al. (2008) states that the rise in domestic exchange rate (depreciation) causes a rise in import prices and the falling prices of export goods, thus the domestic prices will rise. Interestingly, in case of Indonesia, the relationship between exchange rate and real output contradict to the theory itself. When the value of one currency depreciates, it affects more on the changes in capital goods which are imported by Indonesian government from the foreign countries. At the end, it will decrease the real output since the trade balance will be negative.

Furthermore, IPI has also negative response from the impulse of gold price. It means that the increase price of gold will cause the decrease of IPI. This circumstance might happen since Gold in the current monetary system is still used as the commodity not as the price benchmark. At the end, Gold may not create a stable economy unless we use it as the

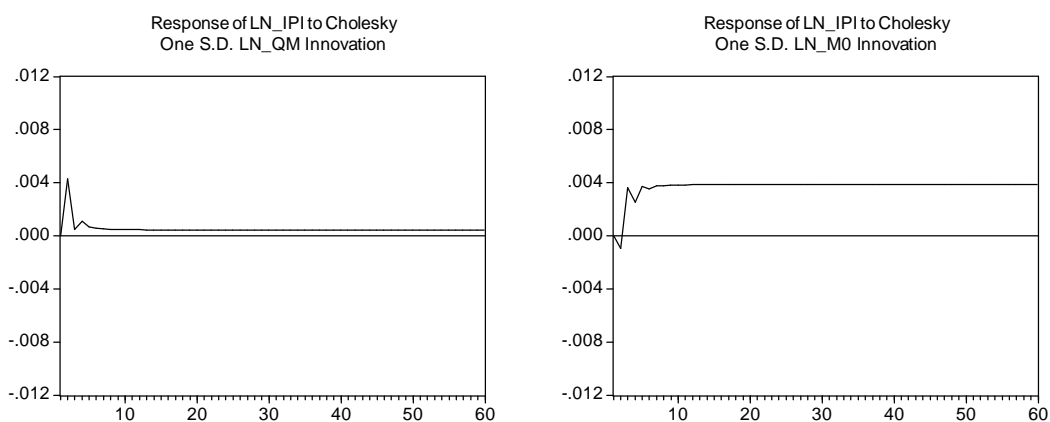
main instrument of monetary policy. However, exchange rate and gold price index are not statistically significant to the change of real output in the long term.



Source: Authors' Own

Figure 4. Response of IPI to Multiple Currencies and Single Global Currency

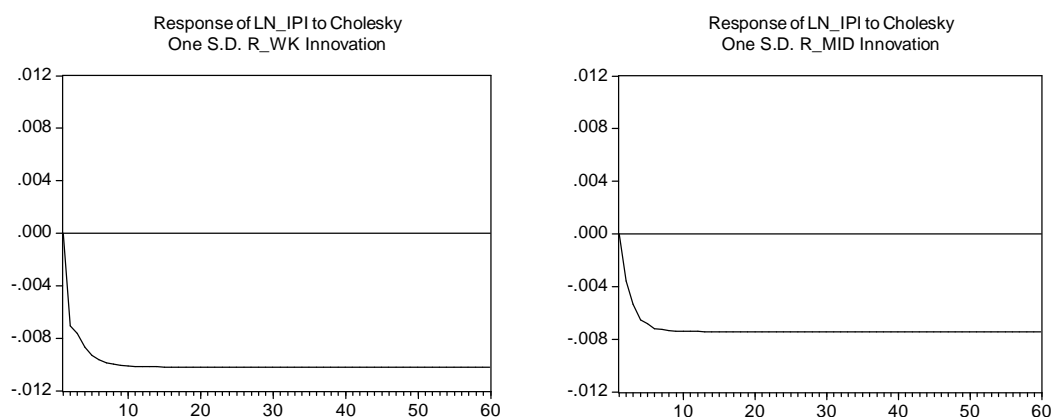
Response of IPI to one standard deviation of quasi money and base money depicts the positive response. By looking at the Figure 5 below, base money (i.e. M0) contributes greater impact to the real output compare to its counterpart. After receiving base money and quasi money shock, real output turn to stabilize within the period 16 and period 17 respectively. Unlike exchange rate and gold, these both variables are statistically significant in affecting real economy.



Source: Authors' Own

Figure 5. Response of IPI to Fiat Money and Just Money

Figures 6 compare the impact of interest rate and *mudharabah* investment rate shock to the changes in IPI. If the variable of interest rate and *mudharabah* investment rate impulse by one standard deviation, it will be responded negatively by real output. These negative correlations have a significant effect in the long term. The higher price of capital, which is determined by those rates, will affect the society regarding decision on investing the money to the real sector. It will finally decrease the growth of economy. Nevertheless, interest rate contributes greater impact to real output rather than *mudharabah* investment return rate does.

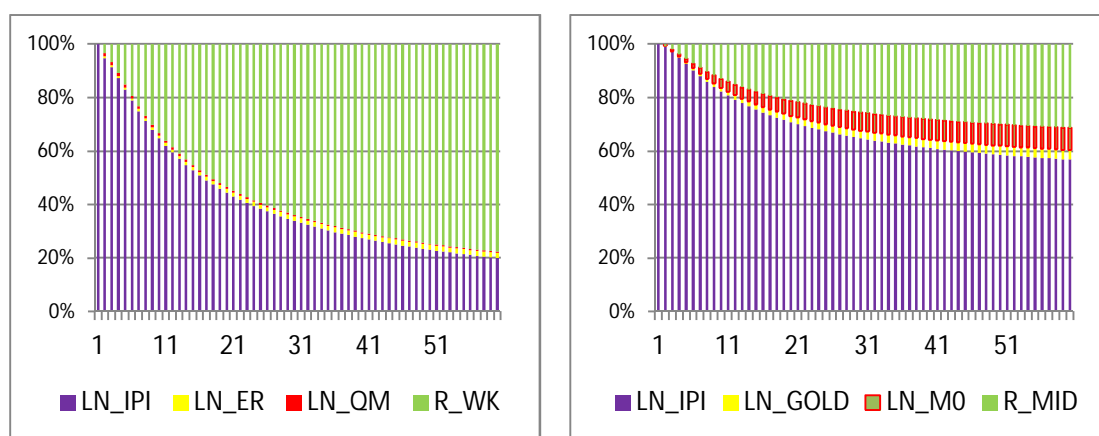


Source: Authors' Own
 Figure 6. Response IPI to Interest Rate and *Mudharabah* Return

4.6. Forecast Error Variance Decomposition (FEVD)

Figures 7 present the result of Forecast Error Variance Decomposition (FEVD) for both Conventional and Islamic determinant. Figure in the left illustrates that in conventional system, interest rate has the biggest proportion towards the behavior of real output with 77.66% followed by exchange rate and fiat money with 1.91% and 0.41% respectively. The result of variance decomposition shows that the influence of interest rate on IPI reached more than 70 percent. It might happen since banking environment in Indonesia is still dominated by conventional systems. The share of Islamic banking assets is less than 4 percent (Bank Indonesia, 2011). Hence, the proportion of Islamic banks to channelize their credit for real sector are still very small compared with conventional banks.

On the other hand, the figure in the right side depicts FEVD of Islamic determinant towards the changes in real output. Unlike conventional system, in the Islamic system, *mudharabah* investment rate (as an alternate for interest rate) only share 31.32% while base money and gold price index give 8.38% and 3.51% respectively to the behavior of Indonesia's real output. Consequently, the replacement of working capital rate with *mudharabah* investment rate will reduce until 46.35% share of the fluctuation that happens in the real output. In addition, Islamic instruments only give 43.2% share to the IPI real economic fluctuation which has smaller contribution than conventional instruments. Therefore, Islamic instruments show a better performance to the real economy.



Source: Authors' Own
 Figure 7. FEVD of Conventional and Islamic Determinant

V. CONCLUSION

This paper tries to compare the effect of Islamic and conventional monetary instruments towards real sector growth in Indonesia. In general, both monetary instruments significantly influence the movement of real output in Indonesia during the period of 2004-2010.

From the conventional instrument, in the long run period, interest rate contributes the highest effect to the real output fluctuation while the Islamic monetary instruments give less fluctuation to the real output. It means that by using the Islamic monetary system, the real output would not be fluctuated as it occurs in the conventional monetary system.

Furthermore, based on the IRF analysis, generally, Islamic monetary instrument is more stable than conventional monetary instrument in responding the shock of exogenous variables. From this finding, it can be concluded that Islamic monetary instruments give a better impact towards real sector growth.

VI. RECOMMENDATION

According to the finding revealed in this study, there are several recommendations pursued, namely:

1. Under dual monetary system, to maximize the performance of real economy can be done by increasing the share of *mudharabah* investment rate, since this rate has better influence than interest rate.
2. Gold in the current monetary system is still used as the commodity not as the price benchmark. As a result, in the end, Gold may not significantly create a stable real economy unless we use it as the main instrument of monetary policy.
3. This study can be improved and extended by the selection of more proxies by applying alternative methods and by comparing with other countries.

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