ENHANCING FINANCIAL SYSTEM STABILITY IN INDONESIAN DUAL FINANCIAL SYSTEM

Adinda Ratu Nur Illiyin

ABSTRACT

In a country adopting dual financial system (conventional and Islamic), monetary authority has the responsibility to maintain financial stability and synergy of both systems by stabilizing price level and promoting economic growth. Three main pillars, which differentiate between the Islamic and conventional financial system, are international monetary system, banking system and financial operation system. Conventional financial system adopts fiat money/ multiple fiat currency, fractional reserve banking and interest systems. Meanwhile, Islamic financial system adopts gold money, Islamic narrow banking and profit-and-loss sharing systems. The main objective of this study is to compare the three main pillars of conventional and Islamic financial system in curbing inflation and promoting economic growth. This study applies Vector Error Correction Model (VECM) using Indonesian data. The results show that interest (INT), fiat money (M0) and multiple fiat currency (EXCH) systems in conventional financial system are the main determinants that induce inflation as well as hinder economic growth. INT induces inflation with 38.44% share and hinders economic growth with 71.72% share. The results also show that profit-and-loss sharing (PLS) and Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) systems in Islamic financial system are the main determinants that curb inflation, as well as promote economic growth for GOLD. GOLD curbs inflation with 0.66% share and promote economic growth with 4.07%. Therefore, the share of Islamic financial system with PLS and GOLD should be increased to its optimum level.

Keywords: Islamic Financial System, Conventional Financial System, Inflation, Economic Growth, VECM

1. INTRODUCTION

1.1 Background

Economic growth and price stability are two of the objectives of economic development for every country, so that sustainable economic development and financial stability could be achieved. However, in the past two centuries these conditions have rarely occurred. Instead, financial crises have occurred one after another since the first financial crisis in England 1825. In the past century, financial crisis have occurred after the gold standard regime in 1915 collapsed. The crisis started with depression in Japan (1920) and followed by other countries such as Germany (1922), Austria (1931), France (1944), Hungary (1944) and Nigeria (1945). The return to gold standard under Bretton Woods Agreements (BWA) has made the world economy developed and international economic stability maintained (Davies, 1996).

After the breakdown of BWA in 1971, international economic stability has gone, while financial crises have reemerged. Leaven and Valencia (2012) recorded that there were 431 episodes of financial crises (147 banking crisis, currency crisis and sovereign debt crisis) in the period of 1970-2011. According to Lietaer, et al. (2009), these financial crises happened not because of cyclical or managerial failures, but

---

1 Adinda Ratu is a Research Assistant at Center for Central Banking Research and Education, Bank Indonesia. adindaratu@hotmail.com
because of structural failures in various countries under very different regulatory systems as well as at different stages of economic development.

Indonesia has also hit by multi-dimensional crisis in 1997-1998. In this multi-dimensional crisis, inflation has increased up to 64% and Rupiah value has jumped to Rp11000/US$ from Rp2600/US$, while economic growth has contracted to 13.1% (Ascarya, 2011). All sectors in the economy have contracted significantly. Moreover, currency depreciation had made public debt to reach US$60 billion in November 1997, which imposed severe strains on the government's budget. Indonesia has suffered the most with fiscal cost reached 56.8% of GDP, while output loss reached 67.9% of GDP (Laeven and Valencia, 2008). In the middle of multi-dimensional chaos, Bank Muamalat Indonesia, the only Islamic bank existed at that time has survived from this crisis. Islamic finance has proven to be more resilient to financial crisis than that of conventional finance. From this experience, Indonesia reformed its financial system and adopted dual financial system, where conventional financial system exists side by side with Islamic financial system, in 1999.

In a country adopting dual financial system, the authority has the responsibility to maintain financial stability and synergy of both systems by stabilizing price level and promote economic growth. Therefore, there should be a study to investigate the impact of conventional and Islamic financial systems in an economy under dual financial system, such as Indonesia, to economic growth and financial stability.

1.2 Objective

There are three main distinct characteristic pillars of Islamic and conventional financial systems. These three main pillars are money system, banking system, and financial operation system. The objective of this study is to compare the three main pillars in curbing inflation and promoting economic growth.

1.3 Data and Methodology

The data used in this study is secondary data of monthly time series obtained from Indonesian Economic and Finance Statistics of Bank Indonesia (SEKI-BI), Shariah Banking Statistics of Bank Indonesia (SPS-BI), as well as PLS returns from major full-fledged Islamic for the period of January 2004 to June 2012. While, the method applied is Vector Auto Regression (VAR) followed by Vector Error Correction Model (VECM).

2. LITERATURE REVIEW

There are various schools of thought in economic system. The two contrasting economic systems are conventional economic system and Islamic economic system. These two systems have different paradigms. The three main differences between these two systems lay in the three main pillars, namely, money system/ multiple fiat currency, banking system and financial operation system. The comparison between conventional financial system and Islamic financial system can be read in Table 1.1.

<table>
<thead>
<tr>
<th>Table 1.1: Comparisons of Conventional and Islamic Financial Systems</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Islamic</strong></td>
</tr>
<tr>
<td>Money System/ International Monetary System</td>
</tr>
<tr>
<td>Banking System</td>
</tr>
<tr>
<td>Financial Operation System</td>
</tr>
</tbody>
</table>

Source: Ascarya (2007), modified by authors.
2.1 Fiat Money/Multiple Fiat Currency and Gold (or Gold-backed) Money and/or Single Gold Standard

Fiat money is something (usually in the form of paper or coin) that is acknowledged as a legal medium of exchange in a certain jurisdiction or state, even though it does not carry a value or back up equivalent to its nominal value. The issuance of fiat money creates a new purchasing power out of nothing. Therefore, fiat money gives unfair benefit, usually known as seigniorage, to the money issuer authority. Within economic system where fiat money is used, the institution given the authority to issue money (usually central bank, monetary authority, treasury department, or other appointed institution) gains this seigniorage benefit. Consequently, aggregate purchasing power of money will decrease (in the form of inflation) equivalent to the percentage of new money added (issued) in the economy. Money in Islam is either full bodied money or fully backed money. In this new money issuance, there is no new purchasing power created (no seigniorage). Furthermore, in the printing process of new money, the cost of printing is the government responsibility, so that there is no party suffers financial loss (Ascarya, 2007). The value of a currency is relatively stable when it is backed by gold. But, when a currency has no more back up from gold, its value depreciates quickly.

Current international monetary system is based on multiple fiat money of every country in the world without any back-up of real assets. Therefore, each country gains seigniorage profits of printing the national currency on the burden of all people as money holders in the form of depleting purchasing power. Super power country gains a huge seigniorage, since its currency is used as international currency. This condition makes persistent inflation and unfairness, especially for small countries with un-convertible currency. The more a currency is used as international payment, the more a country gains seigniorage and country with un-convertible currency can only enjoy seigniorage in national level.

Meera and Larbani (2006) state that fiat money system, together with fractional reserve banking system, was argued to redistribute ownership of assets in the economy unjustly and indiscriminately. The wealth-distributing mechanism was argued to be similar to theft while taxing the whole economy in the form of inflation. Indeed, fiat money system was argued to be unjust, unstable and unsustainable in the long-run.

Meanwhile, money in Islamic financial system is either full bodied money (money, in the form of gold or silver, which has intrinsic value equivalent to its nominal value) or fully backed money (money, usually in the form of paper or coin), which its nominal value is backed by 100 percent gold equivalent stored by the issuing authority. In this new money issuance, there is no new purchasing power created (no seigniorage), so that there is no riba involved. Furthermore, in the printing process of new money, the cost of printing is the government responsibility, so that there is no party suffers financial loss.

In the Islamic financial system where Islamic money is used, the institution given the authority to issue money does not gain seigniorage benefit; even it has to take the responsibility of printing costs. The amount of money added (issued) to the economy is aligned with the growth of value added of the economy, so that Islamic economic in general does not have inflationary nature and tends to be stable. Therefore, the value of dinar (in gold) and dirham (in silver) have always been relatively stable.

2.2 Fractional Reserve Banking System and Narrow Banking System

Fractional reserve banking system means that a bank is required to hold reserve in only a certain percentage of deposits mobilized. With this system, bank has the ability to create another kind of fiat money, i.e. bank money (demand deposits, electronic money), through multiple deposit creation. In this case, money is created when a bank extends loan. For example, if the required minimum reserve is 10%, Rp1 million deposit, first, will be recorded as ‘Deposit’ in liability side and cash ‘Reserve’ in asset side. Second, since reserve requirement is only 10%, the bank can extend loan as much as Rp 9 million, so that the total deposit becomes Rp10 million. This transaction illustrated below (Ascarya, 2009).

---

Paper Proceeding of the 5th Islamic Economics System Conference (IECONS 2013), "Sustainable Development Through The Islamic Economics System", Organized By Faculty Economics And Muamalat, Universiti Sains Islam Malaysia, Berjaya Times Square Hotel, Kuala Lumpur, 4-5th September 2013.
The formula of multiple deposit creation can be written as follows (Meera, 2004):

\[ D = \frac{1}{r} \times R \]

Where, \( D \) = change in total deposit; \( r \) = minimum reserve ratio (e.g., 10%); and \( R \) = change in reserve (e.g., new deposit Rp1 million). In this example, deposit of Rp1 million can create new money (deposit) nine times of its original value, Rp9 million, so that the total deposit becomes Rp10 million. Therefore, fractional reserve banking system also gives unfair seigniorage profit to the bank which authorized to create new bank money. Consequently, the creation of bank money will also make the aggregate purchasing power of money to decrease (in the form of inflation) equivalent to the percentage of new bank money created by bank. The party who suffer a loss with the creation of new bank money is, again, the whole population who holds this money.

Narrow banking system does not give the opportunity for bank to create new bank money, since narrow banking system has to be deposited back to central bank. A bank can only extend loan as much as the original deposit. Therefore, there will be no seigniorage, there is no inflationary effect, and there is no party suffered any loss. For example, Rp1 million deposits, first, will be recorded as ‘Deposit’ in liability side and cash ‘Reserve’ in asset side. Second, since reserve requirement is 100%, the bank can only extend loan as much as Rp1 million, so that in the asset side, the ‘Reserve’ becomes ‘Loan’ of Rp1 million. This transaction can be illustrated below (Ascarya, 2009).

Money creation through fractional reserve banking system has made the 20th century one of the highest inflationary centuries on the historical record; inflation is obviously not a problem specific to the process of money issuance by governments (Lietaer et al., 2008).

### 2.3 Interest and Profit and Loss Sharing

Interest system is a risk shifting so that there is always unfairness. When all market players don’t want to share the risk, someone will become a victim of the system. It also means interest rate is basically provides guaranteed profit for one party against unpredictable future events. Interest rate will force the market to give positive return while real productivity could be higher or lower than the interest rate, so that the business may gain profits or suffer losses.

The emergence and expansion of interest system with money as a commodity and rate of interest as its price, new financial markets emerged in parallel with the main market of goods and services in the real
sector, such as capital market, money market, bond market and derivatives market. Since financial markets offer fixed and predetermined rate of return, capital that originally is invested in the real sector, flows swiftly to financial sector (which cannot produce real value added), so that the amount of capital concentrated in financial sector has exceed tens of times to that in the real sector (which can produce real value added). Financial sector, which is originally serves as supporting entity to the real sector, has developed as a separate sector that has its own products and prices (Ascarya 2009).

Sakti (2007) argues that the economy is inevitably dichotomized into two main activities, namely real activity and monetary activity. Interest rate should reflect productivity level of the capital but that never happens and the consequent of this misallocation of resources has made lack of capital to grow in the real sector. Because of that there is always a gap between interest rate and real productivity that leads to market distortion. When this gap exited, the market will react negatively. Then, there is always a bubble in economic growth. This bubble economy is like a time bomb that will explode at some point in the future in the form of crisis.

In conventional economy, money as commodity, and the permissibility of speculation cause the creation of money (paper money and bank money) and concentration of money in monetary sector to seek higher return with less or no risk. Consequently, money or investment that should be channeled to the real sector for productive purposes mostly flows to the monetary sector and impedes growth, and even reduces the size of real sector. The creation of money without value addition will cause inflation. In the end, the goal of economic growth will be impeded.

**Figure 2.1 The Implication of Interest to Economy**

![Diagram showing the implications of interest to economy](source: Sakti (2007))

The alternative of interest system in Islamic financial system is profit-and-lost sharing (PLS) system. The zakah system, PLS system and the prohibition of speculation will accelerate investment activities to the real sector for productive purposes. This will ensure the distribution of wealth and income as well as the growth in the real sector. The improvement in productivity and opportunity to work and to do business finally will accelerate economic growth, and therefore, social wellbeing will be achieved (read figure 2.2).

**Figure 2.2 The Implication PLS System to Economy**

![Diagram showing the implications of PLS system to economy](source: Sakti (2007))
2.4 Previous Studies


In empirical studies, Ryandono (2006) compares conventional interest system and Islamic PLS system. He concludes that interest system has negative relationship with the economy and causes money turns over becomes ineffective and inefficient at macro and micro levels, which subsequently cause instability in the economy. This finding is in line with Ascarya (2011) who analyses how to eradicate inflation under dual monetary system, which’s concludes that the highest contributor to induce inflation is Interest system. Moreover Darrat (2000), which takes Iran and Pakistan for his case study in determining the stability of demand for money under interest system as well as interest-free system, finds that interest-free system a) improves overall macroeconomic performance; b) leads to a smoother behavior of money velocity; c) provides policymakers with a more controllable monetary environment; and d) strengthens the linkage between policy instruments and the main policy goal of price stability. Moreover, in his descriptive study, Rab (2010) believes that system of interest cannot be sustained without monetary manipulation and it is in gross conflict with nature as its efficient working require rate of return of economic activities to be nearly equal while natural laws ensure that it is distributed over a wide range, which leads to unemployment as well as inefficient allocation of resources. Furthermore, it causes gross economic imbalance.

Meera and Larbani (2006) state that fiat money system, together with fractional reserve banking system, was argued to redistribute ownership of assets in the economy unjustly and indiscriminately. The wealth-distributing mechanism was argued to be similar to theft while taxing the whole economy in the form of inflation. Indeed, fiat money system was argued to be unjust, unstable and unsustainable in the long-run. Rab (2010) states that currency is the measure of wealth that market uses as the scale in the process of determination of prices, which constitutes measurement of wealth. It is implied that error in measurement has to be corrected and it means that we must correct our accounting. This manipulation of currency is extremely harmful for the economy in the long run and it is the root cause of most of the major economic, social and political problems.

In the empirical study, Ascarya (2011) finds that the root causes of inflation are fiat money, price control and fractional reserve banking system. Meanwhile, Ibrahim (2006) finds three evidences, namely: 1) the results portray clearly an important causal role of money supply for other macroeconomic variables; 2) expansion in money supply is inflationary; and 3) money supply – interest rate and money supply – stock price interactions are destabilizing. Moreover, Yanuarti and Hutabarat (2006), Husman (2007) and Ascarya (2009; 2011; 2012) find exchange rate (i.e., multiple fiat money system) has proven to be one of the main contributors to induce inflation in several countries, including Indonesia, while exchange rate is not only contribute to induce inflation but also hinder economy growth. Suselo, et al. (2008) also finds the depreciation of rupiah and volatility of exchange rate will hinder economy growth in Indonesia.

Meera and Larbani (2003) argue that using gold instead of national currencies in multiple payment arrangement (MPA) eliminates exchange rate risk while allowing countries without any international reserves to trade freely. Using gold will greatly reduce, if not eliminating, speculative and arbitrage activities among the currencies of the participating countries. The MPA is more efficient and requires a much lower amount of gold for settling the trade balances. The overall benefits are thus monetary stability, justice, increased trade and economic prosperity with minimum international reserves, i.e. things that are very much at stake in the current highly ‘blown-up’ vulnerable global fiat monetary system. There are also some proves from Ascarya (2009; 2011; 2012), where he finds that the highest contributor to prevent Inflation is gold standard and Profit-and-loss sharing (PLS). To prevent crisis effectively Ascarya suggests that lower interest rate will decrease inflation, while international
monetary system should move towards a just single (Gold) currency system where Gold standard is the most just and stable monetary system. M. Yusuf, et al. (2002) argue that if Malaysia implement the Gold Dinar side by side with Ringgit Malaysia, it is possible the that speculators will change from speculating on currencies toward on gold prices to obtain profit. However, the impact of manipulation currencies toward one economy could be reduced because of the gold does not inflate in value as it is a commodity and has an intrinsic value.

Ryandono (2006) finds that interest system can impede investment and economic growth, so that it is difficult to synchronize monetary sector and real sector, since the two sides have different interests and objectives in the economy which is difficult to settle. In contrast, PLS system has positive relationship with the economy and causes money turnover becomes effective and efficient at macro and micro levels, and subsequently will cause stability in the economy. PLS system can stimulate investment and economic growth, so that it will synchronize monetary sector and real sector, since the two sides have similar interests and objectives in the economy.

There are a number of reasons why persistent inflation might tend to reduce economic growth. Motley (1994) finds that inflation may affect saving and investment decisions, reducing the proportion of GDP devoted to investment and so causing the economy to accumulate less human or physical capital. For example, when inflation is high, it is usually more volatile, so that it is harder to forecast. This condition may make it more difficult to deduce the real returns on investments from available market information and may cause savers and investors to be less willing to make long-term nominal contracts or to invest in long-term projects. The resulting reduced stocks of productive capital may, in turn, imply lower levels of future GDP. In addition, Barro (1997) also finds that growth rate is enhanced by lowering inflation and government consumption. Meanwhile, Tabi (2011) analyzes Cameroon data from 1960-2007 on inflation and growth. The results show that money in circulation causes growth and growth causes inflation.

3. METHODOLOGY

3.1 Type and Source of Data

The data used in this study is secondary data of monthly time series obtained from Indonesian Economic and Finance Statistics of Bank Indonesia (SEKI-BI), KITCO, BPS, Sharia Banking Statistics of Bank Indonesia (SPS-BI), as well as PLS returns from major full-fledged Islamic for the period of January 2004 to June 2012.

3.2 Variable and Operational Definition

The variables used in this study and their operational definitions are as follows.

1. Inflation (INF) is the index of monthly CPI inflation obtained from SEKI-BI.
2. Growth (GRWTH) is the index of monthly Industrial Production Index, data obtained from BPS.
3. Interest System (INT) is the monthly 1-month working capital loan rate of conventional banks obtained from SEKI-BI.
4. Profit-and-Loss Sharing System (PLS) is the returns of investment from Islamic bank represented by equivalent rate from the actual returns of Mudharabah time deposit or investment obtained from full-fledged Islamic banks and sharia Banking Statistics of Bank Indonesia (SPS-BI).
5. Multiple Fiat Currency (EXCH) is the nominal Rupiah exchange rate to the US Dollar obtained from SEKI-BI.
6. Fiat money (M0) is equilibrium intrinsic proximate by the monthly M0, data obtained from SEKI-BI.
7. Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) is gold price index obtained from KITCO.

8. Fractional Reserve Banking System (M2) is the monthly M2, data obtained from SEKI-BI.

3.3 Method of Estimation
This study will apply Vector Auto Regression (VAR)/Vector Error Correction Model (VECM) to determine the dynamics of Islamic bank financing channel. VAR is an \( n \)-equation with \( n \)-endogenous variable, where each variable is explained by its own lag, as well as current and past values of other endogenous variables in the model. Therefore, in the context of modern econometrics, VAR is considered as multivariate time series that treats all variables endogenous, since there is no confidence that a variable is actually exogenous, and VAR allows the data to tell what actually happen (Ascarya, 2010). Sims (1980) argue that if there is true simultaneity among a set of variables, they should all be treated on an equal footing and there should not be any a priori distinction between endogenous and exogenous variables. The general VAR model mathematically can be represented as follows.

\[
x_t = \mu_t + \sum_{i=1}^{k} A_i + X_{t-1} + \varepsilon_t,
\]

(3.1)

Where \( x_t \) is a vector of endogenous variables with \( (n \times 1) \) dimension, \( \mu_t \) is a vector of exogenous variables, including constant (intercept) and trend, \( A_i \) is coefficient matrix with \( (n \times n) \) dimension, and \( \varepsilon_t \) is a vector of residuals. In a simple bivariate system \( yt \) and \( zt \), \( yt \) is affected by current and past value of \( zt \), while \( zt \) is affected by current and past value of \( yt \). When data level is not stationary and there is a cointegration between variables, the dynamic relationships of cointegrated system can be determined by VECM. VECM will also overcome the drawback of first difference VAR and regain the long-term relationships among variables. The trick is to reincorporate original equation in level into the new equation as follows.

\[
\Delta x_{t-1} = \mu_t + \Pi x_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta x_{t-i} + \varepsilon_t
\]

(3.2)

Where, \( \Pi \) and \( \Gamma \) are functions of \( A_i \). The matrix \( \Pi \) can be decomposed into two matrices \( \lambda \) and \( \beta \) with \( (n \times r) \) dimension. \( \Pi = \lambda \beta^T \), where \( \lambda \) is called an adjustment matrix and \( \beta \) is a cointegration vector. Moreover, \( r \) is a cointegration rank.

VAR/VECM analysis process can be read on figure 3.1. After basic data is ready, data is transformed into natural logarithm form (\( \ln \)), except for interest rates and the PLS return, to obtain consistent and valid results. The first test conducted was the unit root test, to find out whether data is stationary or still contain trends. If the data are stationary at levels, then VAR can be conducted at level. VAR level can estimate the long-term relationship between variables. If data are not stationary at level, then the data should be reduced at the first level (first difference), which reflects the difference or changes in data. If the data are stationary at first difference, then the data will be tested whether there is cointegration between variables. If there is no cointegration between variables, then VAR can only be done at the first difference, and it can only estimate the short-term relationship between variables. Innovation accounting would not be meaningful for the long-term relationship between variables. If there is cointegration between variables, then VECM can be done using data level to obtain long-term relationship between variables. VECM can estimate the short-term and long term relationship between variables. Innovation accounting for the level VAR and VECM will be meaningful for the long-term relationships.
Impulse response function analysis is performed to see the response of an endogenous variable to the shocks of other variables in the model. Decomposition variance analysis is also carried out to see the relative contribution of a variable in explaining the variability of the endogenous variable. The software used in this research is Eviews.

The advantages of VAR method compared to other econometric methods, among others, are (Gujarati, 2004 and Enders, 2004): 1) VAR method is freed from various economic theory restrictions that often exists, such as spurious variable endogeneity and exogeneity; 2) VAR develops model simultaneously within complex multivariate system, so that it can capture all relationships among variables in the equation; 3) Multivariate VAR test can avoid biased parameters due to exclusion of relevant variables; 4) VAR test can detect the relationships among variables within equation system by treating all variables endogenous; 5) VAR method is simple where one does not have to worry about determining which variables are endogenous and which ones exogenous, since VAR treats all variables endogenous; 6) VAR estimation is simple where the usual OLS method can be applied to each equation separately; and 7) The estimate forecasts obtained are in many cases better than those obtained from other more complex simultaneous-equation models.

Meanwhile, the disadvantages and problems of VAR model, according to Gujarati (2004), are: 1) VAR model is a-theoretic, since it uses less prior information, unlike simultaneous-equation model where exclusion and inclusion of certain variables plays a crucial role in the identification of the model; 2) VAR model is less suited for policy analysis, due to its emphasis on forecasting; 3) Choosing the appropriate lag length is the biggest practical challenge in VAR modeling, especially when there are too many variables with long lag-length, so that there will be too many parameters that will consume a lot of degree of freedom and require a large sample size; 4) All variables should be (jointly) stationary. If not, all data should be transformed appropriately, e.g. by first-differencing. Long-term relationships will be lost in the transformation of data level needed in the analysis; and 5) Impulse Response function (IRF) is the centerpiece of VAR analysis, which has been questioned by researchers.

3.4 VECM Model

The VECM model of this study follows the general model of VECM as expressed in equation 3.2, which will be divided into two models. The first model uses inflation (which will be represented by consumer price index, CPI) as final objective, while the second model uses growth (which will be
represented by industrial production index, IPI) as final objective. These simplified models can be represented, as follows.

Inflation Model:
\[ x_1 = \{\text{Inflation (INF), Financial Opt. System, Money System/International Monetary System, Banking System}\} \]

Growth Model:
\[ x_2 = \{\text{Growth (GRWTH), Financial Opt. System, Money System/International Monetary System, Banking System}\} \]

The proxies of endogenous variables mentioned above, conventional as well as Islamic, can be read in the following table (Table 3.1).

<table>
<thead>
<tr>
<th>Variable</th>
<th>Financial Opt. System</th>
<th>Money System/International Monetary System</th>
<th>Banking System</th>
</tr>
</thead>
<tbody>
<tr>
<td>Conventional</td>
<td>Interest System (INT)</td>
<td>Fiat money (MO)/Multiple Fiat Currency System (EXCH)</td>
<td>Fractional Reserve Banking System (M2)</td>
</tr>
<tr>
<td>Islamic</td>
<td>Profit-and-Loss Sharing (PLS)</td>
<td>Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD)</td>
<td>Narrow Banking System (-)</td>
</tr>
</tbody>
</table>

Narrow banking system variable will not be included in the model, because once fractional reserve banking system is replaced by narrow banking system, there is no more money creation from banking system.

Therefore, the complete inflation and growth models can be expressed as follows.

\[
\text{INF} = f (\text{INT}, \text{M2}, \text{EXCH}, \text{PLS}, \text{M0}, \text{GOLD}) \quad (3.3)
\]

and

\[
\text{GRWTH} = f (\text{INT}, \text{M2}, \text{EXCH}, \text{PLS}, \text{M0}, \text{GOLD}) \quad (3.4)
\]

4. RESULTS AND ANALYSIS

Required preliminary tests which should be carried out in VAR/VECM method include unit root test, stability test, optimum lag test, and cointegration test.

4.1 Stationary Test

Stationary test or unit root test is intended to identify the state of the data, whether it is stationary or non-stationary (or, whether it is stationary in level or stationary in first difference). In other words, stationary test is used to identify the variable’s order of integration. When unit root exists, it means that the data is not stationary and has trend component in it, which should be removed to produce un-spurious results. Augmented Dickey-Fuller or ADF test and Phillips-Perron or PP test are used.
simultaneously to test the existence of unit root or the stationary of the data. Using 5% McKinnon critical value, all variables are stationary at first difference.

4.2 Selection of Optimal Lag

Optimum lag length should be used in the VAR system to overcome the problem of autocorrelation. Optimum lag test will determine lag length based on Akaike Information Criterion (AIC), Schwarz Information Criterion (SC) or Hannan-Quinn Information Criterion (HQ). Every models have two possible optimum lags, namely 2 (two), if it based on AIC. Moreover, Every models with lag 2 (two) also produce more realistic results.

4.3 Cointegration Test

Stationary tests have concluded that all variables are stationary in first difference or I (1). The use of level data to obtain long-run relationships (using VECM method) is only possible when there is at least one cointegration between variables. Cointegration test will determine the number of equation systems that can explain long-run relationship based on trace statistics. Trace test of all models indicates cointegrating equations. Therefore, VECM method can be carried out.

4.4 Stability Test

Stability test is aimed to identify the stability of VAR system, so that the results of Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) are valid. The stability test based on modulus or unit-circle will be applied to determine maximum lag length of the VAR system which is still stable within its unit-circle or with modulus less than one. The result of stability test for inflation model shows that the VAR system is stable up to lag 10 with modulus 0.196742-0.989835. Similarly, the result of stability test for growth model shows that the VAR system is also stable up to lag 10 with modulus 0.259181-0.999761.

4.5 Results

The results of VECM including Impulse Response Function (IRF) and Forecast Error Variance Decomposition (FEVD) will be discussed in this section.

a. Impulse Response Function

Impulse Response Function (IRF) results for Inflation model (see figure 4.1) show that conventional variables, namely interest system (INT), fractional reserve banking system (M2), fiat money (M0) and multiple fiat currency (EXCH) give positive and permanent impact to inflation in the long run. In other words, all conventional variables induce inflation. Meanwhile, two Islamic variables, namely profit-and-loss sharing system (PLS) and Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) give negative and permanent impact or curb inflation in the long run.
Results of *Impulse Response Function* (IRF) for Growth model (see figure 4.2) show that two conventional variables, namely interest system (INT), multiple fiat currency (EXCH) and fiat money (M0) give negative and permanent impact or hinder economic growth, while fractional reserve banking system (M2) gives positive and permanent impact or promote economic growth in the long run. Meanwhile, one Islamic variable, namely Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) gives the biggest positive and permanent impact or promote economic growth, while two Islamic variables, namely, profit-and-loss sharing system (PLS) give diminutive negative and permanent impact to economic growth, in the long run.
Figure 4.2: Impulse Response Function (IRF) for Growth Model

Forecast Error Variance Decomposition

Results of Forecast Error Variance Decomposition (FEVD) for inflation model (see figure 4.3) show that the shares of the conventional variables to the variation of inflation are 0.16% for fractional reserve banking system (M2), 38.44% for interest system (INT), 15.69% for fiat money (M0), and 0.72% for multiple fiat currency (EXCH). Note that all of these conventional variables induce inflation. Meanwhile, the shares Islamic variables to the variation of inflation are 2.11% for profit-and-loss sharing (PLS) and 0.66% for Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD). Note that all of these Islamic variables curb inflation.
Result of *Forecast Error Variance Decomposition Inflation* (FEVD) for Growth model (see figure 4.4) show that the shares of conventional variables to the variation of growth are 2.01% for fractional reserve banking system (M2), 71.72% for interest system (INT), for 0.96% for fiat money (M0), and 7.86% for multiple fiat currency (EXCH). Note that all of these conventional variables hinder growth, except fractional reserve banking system (M2). Meanwhile, the shares of Islamic variables to the variation of growth are 2.22% for profit-and-loss sharing (PLS) and 4.07% for Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD). Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) promotes economic growth, while profit-and-loss sharing (PLS) marginally hinder economic growth.
4.6 Analysis

4.6.1 Inflation Model

Interest system in conventional financial system induces inflation with 38.44% share, while its counterpart, PLS system in Islamic financial system, curbs inflation with 2.11% share. These results inline with the prohibition of riba (usury or interest) in Islamic economics, which could damage the economy with high inflation and price increase overtime. In a country adopting dual financial system, where interest system operates side by side with PLS system, the objective of price stability and low inflation could be achieved by increasing the share of PLS system or reducing the share of interest system in the economy. Fiat money (M0) and multiple fiat currency (EXCH) in conventional financial system induces inflation with 15.69% and 0.72% share, while its counterpart Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) in Islamic financial system, curbs inflation with 0.66% share. Although these figures are small, they are inline with Islamic economics, which suggest the adoption of gold or gold backed currency system.

Fractional reserve banking system in conventional financial system creates new money which eventually will induce inflation while narrow banking system in Islamic financial system does not create new money, so that it will not induce inflation. The result shows that fractional reserve banking system (M2) induces inflation with 0.16% share.

4.6.2 Growth Model

Interest system in conventional financial system hinders economic growth with 71.72% share, while its counterpart, PLS system in Islamic financial system, only slightly hinders growth with 2.22% share. These result inline with the prohibition of riba (usury or interest) in Islamic economics, where riba could damage the economy with misallocation of resources, asset flows to financial sector (not to real sector), and decoupling of financial and real sector. As a resulted there is always a gap between interest rate and real productivity that leads to market distortion. In a country adopting dual financial system, where interest system operates side by side with PLS system, the objective of economic growth could be achieved by reducing the share of interest system or increasing PLS system in the economy.

Multiple fiat currency (EXCH) and fiat money (M0) in conventional financial system hinders economic growth with 7.86% and 0.96% share. While its counterpart, Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) in Islamic financial system promotes growth with 4.07% share. Although these figures are small, they are inline with Islamic economics, which suggest the adoption of gold or backed money system. The result shows anomalies that fractional reserve banking system (M2) promote economic growth with 2.01% share. The anomaly could be resulted from very tight money supply condition where M2/GDP in 2012 has only reached 40% (see figure 4.5) this means that when M2 is raise under tight money supply, it will promote growth until it reached sufficient money supply (M2 ≈ GDP).
4.6.3 Overall Analysis

<table>
<thead>
<tr>
<th>Table Summary Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>INFL↑ GRWTH↓</td>
</tr>
<tr>
<td><strong>Conventional</strong></td>
</tr>
<tr>
<td>INT; EXCH; M0</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Islamic</strong></td>
</tr>
<tr>
<td>-</td>
</tr>
</tbody>
</table>

From result shows interest system (INT) is the most inducing inflation with 38.44% share and the most curbing economic growth with 71.72% share, followed by multiple fiat currency (EXCH) with 0.724% share in inducing inflation and 7.86% share in curbing economic growth, fiat money (M0) with 15.69% share in inducing inflation and 0.96% in curbing economic growth. Meanwhile, Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) is the only variable that provides positive impact to economy with 0.66% share in curbing inflation and 4.07% in promoting economy growth. Profit-and-loss sharing system (PLS) is the biggest variable that curbing inflation with 2.11% share and also slightly (negligibly) curbing economic growth with 2.22% share. Fractional reserve banking system (M2) induces inflation with 0.16% share and promotes economic growth with 2.01% share.

The results show anomalies that fractional reserve banking system (M2) in conventional financial system only induce slightly inflation with 0.16% share and promote economic growth with 2.01% share. The anomaly could be resulted from very tight money supply condition where M2/GDP in 2012 has only reached 40% (see figure 4.5). This means that when M2 is raise under money tight supply, it will promote growth until it reached sufficient money supply (M2 ≈ GDP).
5. CONCLUSION AND RECOMMENDATION

5.1 Conclusion
The result shows that in conventional financial system interest rate is the main source of inflation with the share of 38.44%, while fiat money, fractional reserve banking system and multiple fiat currency give trivial share to inflation with the share of 15.69%, 0.16% and 0.72%, respectively. Meanwhile, under Islamic financial system, PLS system and Gold (or Gold-backed) Money and/or Single Gold Standard (GOLD) are the main cure for inflation, where they curb inflation with the share of 2.11% and 0.66%, respectively. The results also show that in conventional financial system, interest system, multiple fiat currency and fiat money are the hindrance of economic growth with the share of 71.72%, 7.86%, and 0.69%, respectively. Conversely, fractional reserve banking system promotes economic growth with the share of 2.01%. Meanwhile, under Islamic financial system, Gold (or Gold-backed) Money and/or Single Gold Standard promotes economic growth with the share of 4.07%. Conversely, PLS system slightly hinders economic growth with the share of only 2.22%. To curb inflation and promote economic growth in dual financial system, such as Pakistan, Malaysia and Indonesia can be achieved by increasing the share of PLS system. If interest system is replaced by PLS system, inflation could be decreased by 40.33%, while economic growth could be increased by 69.50%.

The results show anomalies, where fractional reserve banking system in conventional financial system only induces inflation slightly with only 0.16% share and promotes economic growth with 2.01% share. The anomaly could be resulted from very tight money supply condition where M2/GDP in 2012 has only reached 40% (see figure 4.5). This means that when M2 is raised under tight money supply, it will promote growth until it reached sufficient money supply (M2 ≈ GDP).

5.2 Recommendation
Under dual financial system in Indonesia, to minimize the negative impact of inflation and promote growth can be achieved by returning to gold standard and increasing the share of PLS system. It is sound difficult, but it is not impossible to be implemented gradually. The suggestion for government, central bank and Financial Service Authority (FSA) to minimize the negative impact of inflation, promote growth and enhance the stability of the financial system are as follows.

• The government should have political will and courage to gradually and systematically return to gold standard for a better economy;
• Increase central bank gold reserves;
• The government should ensure people freedom to choose a completely different fair currency;
• Implement gold payment system (including e-gold payment);
• Implement multilateral payment arrangements in gold with other country;
• Convert state owned conventional bank to state owned Islamic bank;
• Develop gold based Islamic financial products, such as gold account;
• Encourage people to save in gold and open two account (fiat money account and gold account);
• State owned enterprises should use Islamic finance for part of their financial activities;
• Muslim civil servants should have account in Islamic bank;
• Islamic businesses and organizations should use Islamic finance for their financial activities;
• Conduct research to develop Islamic financial system
REFERENCES


Rab,Hifzur. (2010), Interest, Monetary Manipulation and Misunderstanding are Stifling Emergence of Just and Efficient Islamic Alternatives, Bangi: International conference The Tawhidi epistemology; Zakat and Wqaf Economy.


