



Key words: Monetary policy transmission mechanism, conventional monetary system, Islamic monetary system, dual financial system, Interest-profit channel

## 1. INTRODUCTION

Indonesia has introduced dual monetary system since the stipulation of new Bank Indonesia Act no 23/1999 in year 1999, where conventional monetary policy coexists with Islamic monetary policy mandated by the new Act. The implementation of dual monetary policy develops gradually in line with the development and growth of Islamic financial system, especially Islamic banking system, since Islamic financial system in Indonesia, like its conventional counterpart, is dominated by Islamic banking.

Islamic monetary policy has been developing in line with the development of Islamic financial system. The basic concept of monetary management in Islam is to achieve money demand stability and to direct the money demand toward important productive activities needed by the society. Chapra (1985) stated that demand for money in Islamic economy would arise basically from the transactions and precautionary needs which are determined largely by the level of money income and its distribution, while the speculative demand for money should be minimized, so that demand for money would essentially be stable. Therefore, monetary instruments that lead to instability and misallocation of resources (funds) would be left out (Karim, 2007).

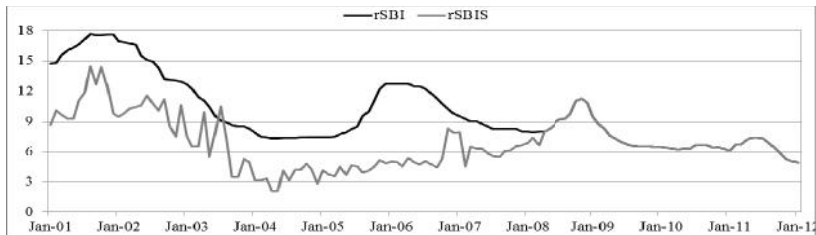
The main objectives of Islamic monetary policy include (Chapra, 1985:1) full employment and economic growth; 2) socio-economic justice and equitable distribution of income and wealth; and 3) the stability in the value of money. Moreover, monetary policy in Islam is a response to the activities in the real sector and a policy that can speed up the velocity of money in the real sector and that can discourage hoarding of money (Ascarya, 2009). Therefore, there is no parallel dichotomy between monetary and real sectors, since monetary sector always links and follows real sector. This is because the characteristic of Islamic finance is based on the real sector. There is no chance of market actors to gain profit from transactions that have no value added in the economy.

Under the dual monetary system, the design of monetary instruments should satisfy two main principles, namely consistency and equality (Astiyah, Nugroho, and Anugerah, 2006). Consistency

between instruments is necessary to make monetary policy in Islamic money market or conventional money market in line with the policy stance of the monetary authority. Therefore, there would be no confusion in market perception about monetary policy signal that could decrease the efficacy of monetary policy. Equality in monetary instrument would provide fair accessibility and pricing for both actors in both markets. Moreover, fair treatment would eliminate arbitrage between the two markets, if there is no clear barrier between them.

With a new mandate as dual monetary authority, Bank Indonesia started to introduce several Islamic monetary instruments comparable to conventional monetary instruments which comply to Shariah in 2000, namely: 1) Statutory reserve requirement for Islamic bank; 2) Shariah interbank money market, with *Sertifikat Investasi Mudharabah Antarbank* or SIMA (*Interbank Mudharabah Investment Certificate*), issued by Islamic bank, as its instrument; and 3) Shariah open market operation with *Sertifikat Wadi'ah Bank Indonesia* or SWBI (*Bank Indonesia Wadi'ah Certificate*). As the lender of last resort for Islamic bank experiencing mismatch, Bank Indonesia introduced standing facilities for Islamic bank called *Fasilitas Pembiayaan Jangka Pendek Syariah* or FPJPS in 2003. As the share of Islamic finance (especially Islamic banking) continue to increase, the need to conduct active monetary policy using proper active monetary instrument could not be ignored. Therefore, in April 2008, BI replaced SWBI with SBIS (*Sertifikat Bank Indonesia Syariah* or *Bank Indonesia Syariah Certificate*). SBIS as Islamic monetary instrument is a comparable counterpart to SBI (*Sertifikat Bank Indonesia* or *Bank Indonesia Certificate*) as conventional monetary instrument or policy rate. SBIS is active monetary instrument using *ju'alah* contract which is a promise or commitment (*iltizām*) to reward certain return (*niwāl* or *ju'āl*) upon attainment (*naṭājah*) determined for a work. The reward of SBIS is benchmarked to the return of SBI, so that consistency and equality requirements are satisfied. The conventional policy rate of SBI and Islamic policy rate SWBI/SBIS can be seen in Figure 1.

FIGURE 1  
Conventional (rSBI) and Islamic (rSBIS) Policy Rates



Source: Compiled and drawn from several Bank Indonesia data and publications (2001-2012).

In line with the development towards full-fledged dual financial system in Indonesia, monetary transmissions under dual financial system should be determined and identified. With the current implementation of Inflation Targeting Framework, interest-profit channel would become one important transmission mechanism in transmitting the monetary policy into real economy and prices. Therefore, this study aims to identify and determine conventional and Islamic monetary policies transmission mechanisms through interest/profit channel, in transmitting the monetary policy into real economy and prices.

## 2. LITERATURE REVIEW

### 2.1 CONVENTIONAL MONETARY POLICY TRANSMISSION MECHANISM

#### 2.1.1 OVERVIEW

Conventional monetary policy transmission mechanism defines by Taylor (1995) as “...the process through which monetary policy decisions are transmitted into changes in real GDP and inflation”. Another definition by Ireland (2008) states that “The monetary transmission mechanism describes how policy-induced changes in the nominal money stock or the short-term nominal interest rate impact on real variables such as aggregate output and employment.”

More specifically, monetary policy transmissions examine the effect of money (money supply,  $M$ ) on economic activity (aggregate output or aggregate spending,  $Y$ ). Monetarists analyze the effect of money supply ( $M$ ) on economic activity ( $Y$ ) as if the economy were a black box whose workings cannot be seen. The monetarist way of looking at the evidence can be represented by a schematic diagram,

in which the economy is drawn as a black box with a question mark, whose workings cannot be seen (Mishkin, 2004:604), since the transmissions are mostly influenced by three factors, namely; a) behavior of central bank, banking and economic actors; b) the lag between policy implementation and achievement of the objectives, and c) changes in monetary transmission channels as economy and finance of a country evolves.

Meanwhile, Keynesian views the process of monetary policy transmission as a structural model, which explains how the economy operates using a collection of equations that describe the behavior of firms and consumers in many sectors of the economy. These equations then show the channels through which monetary (as well as fiscal) policy affects aggregate output and spending (Mishkin, 2004:604).

Loayza and Schmidt-Hebbel (2002) state that monetary policy transmission mechanisms work through various channels, affecting different variables and different markets, and at various speeds and intensities. Identifying these transmission channels is important because they determine the most effective set of policy instruments, the timing of policy changes, and hence the main restrictions that central banks face in making their decisions.

The process of monetary policy to influence final objectives (i.e., prices and output) starts with the transmission of open market operations to market interest rates, either through the reserves market or through the supply and demand for money more broadly. From there, transmission may proceed through any of several channels (Kuttner and Mosser, 2002).

Monetary policy transmission mechanisms have been evolved and categorized in many different ways by different economists, such as, Mishkin (1995), Kuttner and Mosser (2002), and Boivin, Giannoni, and Mojon (2010). Mishkin (1995) divides monetary policy transmission mechanisms into: 1) traditional interest rate channels (traditional Keynesian IS-LM (Investment Saving–Liquidity Preference Money Supply) [investment spending and consumer spending] and interest rate channel [cost of capital/investment spending and consumer spending]); 2) other asset price channels (exchange rate channel, equity price channels [Tobin's  $q$ , wealth effect, and housing and land price channels]); and 3) credit channels (bank lending channel, firms' balance-sheet channels [equity price, cash-flow, and general price], household balance-sheet effects).

Kuttner and Mosser (2002) map monetary policy transmission mechanisms started from open market operation through several channels, namely: 1) narrow credit channel or bank lending channel; 2) broad credit channel; 3) wealth channel; 4) interest rate channel; 5) exchange rate channel; and 6) monetarist channel or money channel.

Mishkin (2004) re-classifies his 1995 monetary policy transmission mechanisms into traditional interest rate effects, other asset price effects (exchange rate effects on net exports, Tobin's  $q$  theory and wealth effects), and credit view (bank lending channel, balance sheet channel, cash flow channel, unanticipated price level channel, household liquidity effects).

Alternatively, Boivin, Giannoni, and Mojon(2010) divide monetary policy transmission mechanisms into: 1) Neoclassical channels (interest rate, cost of capital, Tobin's  $q$ , wealth effects, inter-temporal substitution, and exchange rate effects); and 2) Non-Neoclassical channels (regulation-induced credit effects, bank-based channels, and balance-sheet channel).

### 2.1.2 INTEREST RATE CHANNEL

Interest rate channel initially was introduced in Keynes' General Theory (1936). Monetary policy transmission mechanisms (MPTM) through interest rate channels have become the key mechanisms in the basic Keynesian IS-LM model. The IS-LM model denotes the supply and demand for money which explains how interest rates and total output produced in the economy, given a fixed price level. The ISLM model can be expressed as follows in (1) (Mishkin, 2004: 604):

$$(1) \quad M \uparrow \Rightarrow i_r \downarrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$$

Monetary policy expansion ( $M$ ) leads to a fall in real interest rates ( $i_r$ ), which in turn lowers the cost of capital, causing a rise in investment spending ( $I$ ), thereby leading to an increase in aggregate demand and a rise in output ( $Y$ ).

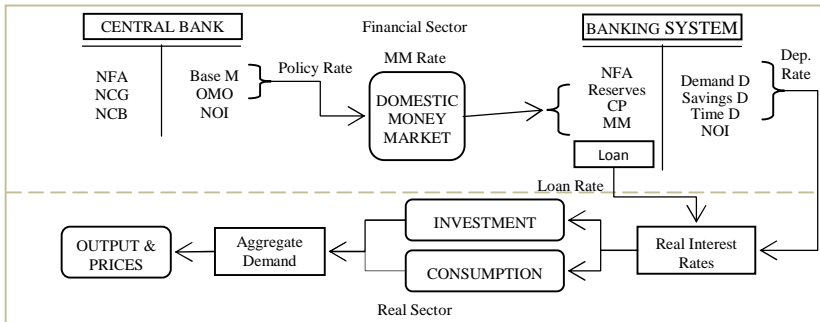
The most important feature of interest channel is the emphasis of real interest rate that affect economic actors' spending (investment and consumption) decisions, so that even though nominal interest rate is zero, monetary policy can still be effective through the changes in expected price level and expected inflation, which can be expressed as follows in (2):

$$(2) \quad M \uparrow \Rightarrow P^e \uparrow \Rightarrow f^e \uparrow \Rightarrow i_r \downarrow \Rightarrow I \uparrow \Rightarrow Y \uparrow$$

Monetary policy expansion ( $M$ ) can raise the expected price level ( $P^e$ ) and hence expected inflation ( $\pi^e$ ), thereby lowering the real interest rates ( $i_r$ ), and stimulating spending in investment ( $I$ ), thereby leading to an increase in aggregate demand and a rise in output ( $Y$ ).

The process in the financial system can also be reflected in the interactions among actors in the financial system, namely, central bank, banking institutions and economic actors. This process is started with monetary policy of central bank announcing policy rate that will be benchmarked by interbank money market rate, which will influence deposits rates (income effect), consumer loan rates (substitution effect) and investment loan rates (cost of capital) in the banking system. These bank rates will affect the behavior of economic actors in investment as well as consumption spending, which in turns will affect aggregate demand a well as output and prices, can be seen in Figure 2.

FIGURE 2  
Transmission Mechanisms of Interest Rate Channel



NFA: net foreign assets; NCG: net claims to government; NCB: net claims to banks; Base M: base money; OMO: open market operation; NOI: net other items; MM Rate: money market rate; CP: commercial papers; MM: interbank money market loan; M Supply: money supply; Demand D: demand deposits; Savings D: savings deposits; Time D: time deposits; Dep. Rate: deposits rates. Source: Warjiyo (2004), modified by author.

Based on Figure 2, interest rate channels comprise of cost of capital channel, income effect channel and substitution effect channel.

a. Cost of Capital

Some economists (i.e., John Taylor) believe that there is interest rate channel of monetary policy transmission mechanism through the cost

of capital (Mishkin, 2004:618). Interest rate channel of cost of capital reflects a modification to the traditional Keynesian IS-LM model, which can be expressed as follows in (3):

$$(3) \quad M \uparrow \Rightarrow i_{INV} \downarrow \Rightarrow i_r \downarrow \Rightarrow I \uparrow \Rightarrow I_g \uparrow \Rightarrow Y \uparrow$$

Monetary policy expansion (M) leads to a fall in investment rates ( $i_{INV}$ ), real interest rates ( $i_r$ ), which in turn lowers the cost of capital, causing a rise in investment spending (I) and investment growth ( $I_g$ ), thereby leading to an increase in aggregate demand and a rise in output (Y). Under inflation targeting framework (ITF), the equation Eq. (3) above schematic expression of cost of capital channel should be modified as follows in (4):

$$(4) \quad i_{POL} \uparrow \Rightarrow i_{INV} \uparrow \Rightarrow i_r \uparrow \Rightarrow I \downarrow \Rightarrow I_g \downarrow \Rightarrow f \downarrow; Y \downarrow$$

Policy rate increase ( $i_{POL}$ ) leads to a rise in investment rates ( $i_{INV}$ ), real interest rates ( $i_r$ ), which then increases the cost of capital, lowers investment spending (I) and investment growth ( $I_g$ ), and finally leads to a decrease in aggregate demand and a decrease in inflation ( $\pi$ ), but also a fall in output (Y).

Some other economists (i.e., Bernanke and Gertler, 1995) even see the failure of traditional interest rate channel and suggest searching for other monetary policy transmission mechanisms.

#### b. Income Effect

Interest rate channel of income effect works through monetary policy influence to deposits rates, which can be expressed as follows in (5):

$$(5) \quad M \uparrow \Rightarrow i_{DEP} \downarrow \Rightarrow i_r \downarrow \Rightarrow C \uparrow \Rightarrow Y \uparrow$$

Monetary policy expansion (M) leads to a fall in deposits rates ( $i_{DEP}$ ), real interest rates ( $i_r$ ), which affects addition in consumption on non-durable goods as well as expansion impact on consumption as they increase future discounted income (C), thereby leading to an increase in aggregate demand and a rise in output (Y). Under inflation targeting framework, the schematic income effect expression in eq. (5) should be modified as follows in (6):

$$(6) \quad i_{POL} \uparrow \Rightarrow i_{DEP} \uparrow \Rightarrow i_r \uparrow \Rightarrow C \downarrow \Rightarrow f \downarrow; Y \downarrow$$

Policy rate increase ( $i_{POL}$ ) leads to a rise in deposits rates ( $i_{DEP}$ ), real interest rates ( $i_r$ ), which then impacts on contraction of consumption on non-durable goods as well as a contraction impact on consumption as they decrease future discounted income (C), and



finally leads to a decrease in aggregate demand and a decrease in inflation (  $\pi$  ), but also a fall in output (  $Y$  ).

### c. Substitution Effect

Interest rate channel of substitution effect works through monetary policy influence to consumer loan rates, which can be expressed as follows in (7):

$$(7) \quad M \uparrow \Rightarrow i_{CONS} \downarrow \Rightarrow i_r \downarrow \Rightarrow C \uparrow \Rightarrow Y \uparrow$$

Monetary policy expansion (  $M$  ) leads to a fall in consumer loan rates (  $i_{CONS}$  ), real interest rates (  $i_r$  ), which affects addition in consumption on non-durable goods as well as expansion impact on consumption as they increase future discounted income (  $C$  ), thereby leading to an increase in aggregate demand and a rise in output (  $Y$  ). Under inflation targeting framework, the above (2.7) schematic substitution effect expression should be modified as follows in (8):

$$(8) \quad i_{POL} \uparrow \Rightarrow i_{CONS} \uparrow \Rightarrow i_r \uparrow \Rightarrow C \downarrow \Rightarrow f \downarrow; Y \downarrow$$

Policy rate increase (  $i_{POL}$  ) leads to a rise in consumer loan rates (  $i_{CONS}$  ), real interest rates (  $i_r$  ), which then impacts on contraction of consumption on non-durable goods as well as contraction impact on consumption as they decrease future discounted income (  $C$  ), and finally leads to a decrease in aggregate demand and a decrease in inflation (  $\pi$  ), but also a fall in output (  $Y$  ).

## 2.2 ISLAMIC MONETARY POLICY TRANSMISSION MECHANISM

### 2.2.1 OVERVIEW OF ISLAMIC MONETARY SYSTEM

#### a. Early Era of Islamic Monetary System

The discussion of Islamic monetary system cannot be separated with the discussion of the evolution use of money in Islam in the early (classic) era and in the contemporary era. Money in the history of Islam has been experiencing ups and downs developments. At the time of Rasulullah saw., gold Dinar was adopted from Byzantine, while silver Dirham was adopted from Sassanid, as legitimate legal tenders.

In the early era when intrinsic money of Dinar and Dirham was used as official currency for transaction and precautionary purposes, when *ribÉ* in its many forms was prohibited and strictly enforced, when speculative economic activities were strictly prohibited and enforced, monetary management became a simple matter, where the government monetary authority (*bayt al-mÉl*) maintained the supply of money (its availability and its uninterrupted circulation) in the economy to meet the demand for money of the real sector. Monetary

sector acted as supporting and integrated part of real sector development.

Government might not acted as the provider of money, but government must acted as supervisory institution (*Īsbah*) to make sure that any money (Dinar or Dirham) which was minted by a third party met the standardized specification. Price stability would always be maintained through the process of automatic check. When Dinar depreciated and the price of gold was higher than the price of Dinar, the third parties would melt their Dinar and took arbitrage profits by selling the gold (melted from Dinar). These arbitrage activities would stop when the price of Dinar appreciated and the price of gold depreciated to a previous or new equilibrium. Alternatively, the holders of Dinar would import goods (and export Dinar) from other countries and took arbitrage profits from cheaper imported goods. These arbitrage activities would stop when the price of domestic goods fell and the price of imported goods rose to a previous or new equilibrium.

#### b. Contemporary Islamic Monetary System

As the demise of Islamic caliphates and dynasties, Islamic money has ceased to exist and has replaced by capitalistic fiat money, created from nothing. Ulamas have different opinions on the use of fiat money as legal tender. Some of them have permitted, while some others have prohibited. As the use of intrinsic money has been replaced by fiat money in the global monetary system, contemporary Islamic monetary system based on fiat money has been developed, since the monetary system plays an important role in Islamic economy to create stability in the demand for money and to guide it to important and needed productive activities in the real sector. Chapra (1985) states several important Islamic monetary objectives: 1) Broad-based economic well-being with full employment and optimum rate of economic growth; 2) Socio-economic justice and equitable distribution of income and wealth; and 3) Stability in the value of money to enable the medium of exchange to be a reliable unit of account, a just standard of deferred payments, and a stable store of value.

According to Chapra (1985), the demand for money, in an Islamic monetary economy, would arise basically from the transactions and precautionary needs which are determined largely by the level of money income and its distribution. The speculative demand for money is essentially triggered by interest rate

fluctuations in the capitalist economies. A decline in interest rates combined with expectations about their rise induces individuals and firms to increase their money holdings. Since interest rates fluctuate frequently in the capitalist economies, there is a continuous change in the public's holdings of money balances. The abolition of interest and the levy of *zakāt* at the rate of two-and-a-half per cent per annum would not only tend to minimize the speculative demand for money and reduce the 'locking-in' effect of interest rates but also impart greater stability to the total demand for money.

The purpose of Islamic monetary is how to distribute the money to the real sectors or to productive investments and to avoid the consumption of unnecessary goods. To reach the goal, there are some main pillars of monetary policy in Islam, namely: 1) Replacing the interest rate with Islamic modes of finance, profit-and-loss sharing, *ijārah*, and buying-selling to control the monetary; 2) The alteration of fractional reserve banking system with narrow banking system (100 per cent reserve for demand deposits and 0 per cent reserve for investment deposits); 3) The application of full bodied money / full backed money; 4) Zakat system and tax on idle productive asset; and 5) Moral suasion.

It can be concluded that the purpose of Islamic monetary policy is to achieve the condition of Full Employment where all production sectors can be utilised optimally, guarantees the stability of currency and price (control the inflation) and the wealth redistribution instrument where the wealth is synergized between the monetary and real sectors. Then the function of central bank is to control the circulation of money and money supply, as a financial market regulator and to guarantee the integrity of banking sector's profit and loss report and to conduct the audit regularly. Besides, the function of central bank can be conducted using various monetary instruments, for example, altering high powered money (base money) through reserve ratio, liquidity ratio, selling and buying of Central Deposit Certificate and other securities, changing profit-sharing ratio, determining *qarī'āsan* ration and controlling the exchange rate.

### 2.2.2 ISLAMIC MONETARY POLICY AND TRANSMISSION MECHANISM

In the ideal Islamic monetary system with all pillars in place, the theory of endogenous money holds. Currency (of precious metals) would be treated as a medium to monetized commodity prices (Choudhury, 1997). No actual monetized value can be imputed to

goods that are separated by time periods, so that transactions between similars were required to be in cash and had to be done immediately, while transactions between dissimilars could take place by credit (*bayʿ al-murʿabah*, *bayʿ as-salam*, etc.) and hire purchase (*ijʿrah*), provided they involved some forms of *mushʿarakah* (equity participation and co-financing) or *mulʿrabah* (profit-and-loss sharing under economic cooperation).

In the contemporary era of inflation economics, Islamic monetary system operates with the adoption of fiat money and fractional reserve banking systems, which are not in accordance with Islamic teachings, due to the existence of *ribʿ* in the creation of fiat money and bank money, so that the theory of endogenous money might not holds (money supply and money demand have their own functions). To achieve the objectives of Islamic monetary policy, the implementation of available Islamic monetary instruments would be optimized to ensure that the supply of money follows the demand for money.

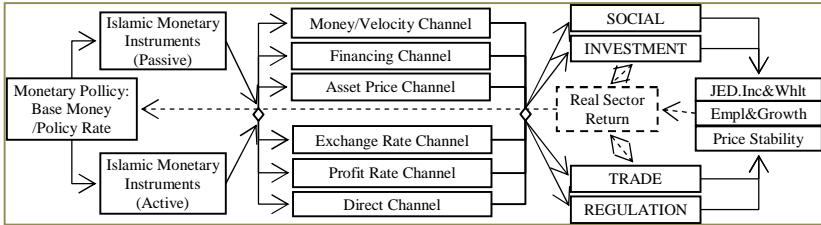
The variable in terms of which monetary policy should be formulated in an Islamic economy is the stock of money rather than the level of interest rates, which means that quantitative approach is preferable than price approach, with money channel as the main monetary policy transmission mechanism.

The Islamic central bank should gear its monetary policy to the generation of a growth in money supply which is adequate to finance the potential growth in output over the medium- and long-terms within the framework of stable prices and the other socio-economic goals of Islam. The objective should be to ensure that monetary expansion is neither 'inadequate' nor 'excessive' but sufficient to exploit fully the capacity of the economy to supply goods and services for general broad-based welfare (Chapra, 1985:188). Furthermore, the control of money supply in Islamic monetary policy is not necessarily implying a simple monetarist approach. It should, in fact, be emphasized that for a full realization of the Islamic goals, it will not only be indispensable to reform the economy and the society along Islamic lines but it will also be necessary for the state to play a positive role, and all state policies, including fiscal, monetary and incomes, would have to converge in the same direction.

Therefore, Islamic MPTM can be illustrated in Figure 3. Monetary policy (either quantity or price approach) through passive and active instruments will be transmitted through various channels, namely, money channel, velocity channel, financing channel, asset price channel, exchange rate channel, profit channel, and direct channel, to influence real economic activities, including social,

investment, trade and regulation, to achieve just and equitable distribution of income and wealth, employment, economic growth and price stability. Real sector return of the economy will give feedback to set policy rate of return.

FIGURE 3  
Islamic Monetary Policy Transmission Mechanisms

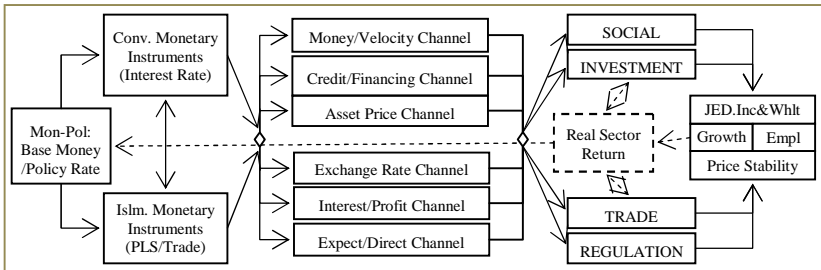


Note: Conv: Conventional; Mon-Pol: Monetary Policy; PLS: Profit-and-Loss Sharing; JED. Inc&Whlt: Just and Equitable Distribution of Income and Wealth.

2.3 DUAL SYSTEM

Monetary policy transmission mechanism (MPTM) in contemporary Islamic monetary system has not been firmly developed yet. Therefore, countries developing Islamic monetary system in their current conventional system toward the implementation of full-fledged dual monetary system have been developing their dual monetary system based on the existing framework of conventional monetary policy, which is mostly implementing inflation targeting framework with price approach.

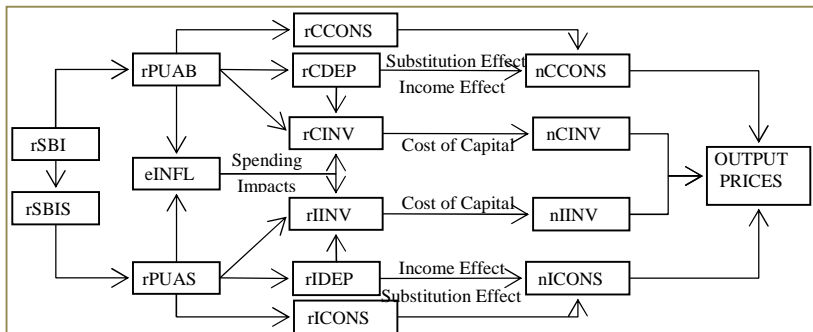
FIGURE 4  
Monetary Policy Transmission Mechanisms under Dual Financial Systems



Note: Conv: Conventional; Mon-Pol: Monetary Policy; PLS: Profit-and-Loss Sharing; JED.Inc&Whlt: Just and Equitable Distribution of Income and Wealth.

MPTM under dual financial system in contemporary economy can be illustrated in Figure 4. Open market operation (price approach under ITF) will determine policy rate, which will be translated into interest rate in conventional system and Profit-and-Loss Sharing (PLS) rate or margin in Islamic system, through several conventional and Islamic monetary instruments, including statutory reserve requirement, standing facilities, open market operation and exchange rate intervention, will be transmitted through various channels, profit channel, financing channel, asset price channel, exchange rate channel and expectation channel, to influence real economic activities, including investment and consumption, to achieve economic growth and price stability. The real sector return (as well as inflation and economic growth) will give feedback to monetary policy.

FIGURE 5  
Interest-profit Channels of MPTM under Dual Financial Systems



Note: rSBI: rate of SBI; rSBSIS: return SBIS; rPUAB: rate of conventional interbank money market; rPUAS: return of Islamic money market; eINFL: expected inflation (industrial production index<sub>t+1</sub>); rCINV: conventional real investment rate; rIINV: Islamic real investment return; rCDEP: interest on conventional deposits; rIDEP: return on Islamic deposits; rCCONS: interest on conventional consumer loan; rICONS: margin on Islamic consumer financing; nCINV: conventional investment spending; nIINV: Islamic investment spending; nCCONS: total amount of conventional consumption spending; nICONS: total amount of Islamic consumption spending; OUTPUT: industrial production index; PRICES: consumer price index.

Meanwhile, complete interest/profit channels of MPTM under dual financial system, including cost of capital (basic Keynesian, modified Keynesian and spending impacts), income effect and

substitution effect, for the case of Indonesia, can be illustrated in Figure 5.

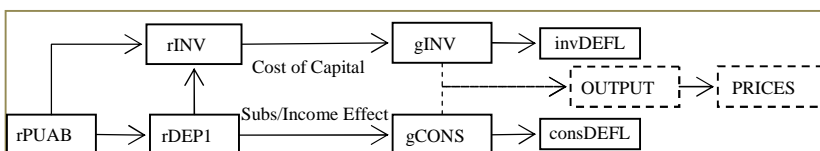
2.4 PREVIOUS STUDIES

This study will focus on interest/profit channels of MPTM, so that this section will limit the discussion on the previous studies on interest/profit channels. Studies on conventional interest rate channel of monetary policy transmission have been done extensively in countries adopting conventional economic system, since it is one the oldest transmission channel, which has been clearly defined in Keynes's General Theory. Some recent (post Asian crisis era) studies, among others, include Caparole and McKiernan (1999), Mojon (2000), Chatelain et al. (2003), Angeloni et al. (2003), Yiding and Shuanghong (2006), Kobayashi (2008), Bonga-Bonga (2010), Samba and Yan (2010), and Iwata (2010). Most studies argue that interest rate channel is still among the most important channel of monetary policy transmission. However, Mishkin (2011) voices risk taking channel as another important monetary policy transmission channel.

In the case of Indonesia, several studies on conventional interest rate channel have been done, among others, by Kusmiarso, Sukawati, Pambudi, Angkoro, Prasmuko, and Hafidz (2002), Muelgini (2004), Astiyah (2005), Zulverdi and Santoso (2005), Safuan and Laksono (2007), Natsir (2008), Dewati, Suryaningsih and Chawwa (2009). While, studies on Islamic profit channel have been done, among others, by Ascarya (2010) and 'Ayuniyyah, Achسانی, and Ascarya (2010).

Kusmiarso et al. (2002) test interest rate channels for pre-crisis and post-crisis periods. The model can be illustrated as below in Figure 6, which includes cost of capital and substitution/income effect, excluding objective variables (output and prices).

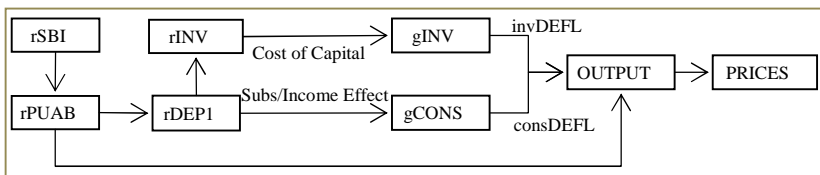
FIGURE 6  
Interest Rate Channels Model from Kusmiarso et al. (2002)



Interest rate channel through cost of capital includes endogenous variables as follows: interbank money market rate (rPUAB),

investment loan real rate (rINV), investment growth (gINV), and investment deflator of inflation (invDEFL). Meanwhile, interest rate channel through substitution/income effect includes endogenous variables as follows: interbank money market rate (rPUAB), 1-month deposit real rate (rDEP1), consumption growth (gCONS), and consumption deflator of inflation (consDEFL). They find Granger causality evidences of interest rate channels for post-crisis period as follows in Figure 7, which includes objective variables (output and prices) as well as investment and consumption deflators.

FIGURE 7  
Granger Causality Result of Interest Rate Channels Model from Kusmiarsoet al. (2002)



The results of cost of capital channel show that before the crisis, real deposit rate and real investment loan rate were strongly influenced by policy rate (inter-bank rate), whereas after the crisis, real deposit rate and real investment loan rate response to policy rate is weaker as compared to pre-crisis period. Real sector responds significantly to banking interest rate after crisis period. Investment growth responds stronger as compared to pre-crisis to real investment loan rate because investor has limited access to other source of financing. Meanwhile, in pre-crisis period, investors had high access to offshore borrowing, so that, investment growth was weakly influenced by the change in the real investment loan rate.

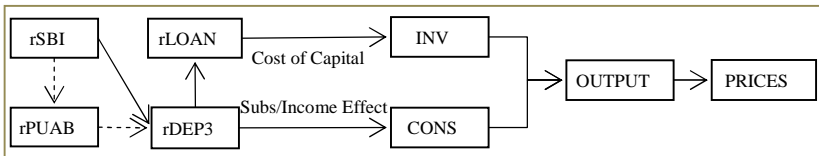
The results of substitution/income effect show that consumption growth is influenced significantly by change of inter-bank interest rate in post-crisis. The increase of inter-bank interest rate is initially responded by a negative growth of consumption, showing the presence of substitution effect. However, when the deposit real rate starting to decrease, household consumption follows to decrease, indicating the presence of income effect.

Astiyah (2005) describes interest rate channels as illustrated in Figure 8, which includes cost of capital and substitution/income effect. Cost of capital channel includes endogenous variables SBI rate (rSBI), 3-month deposit rate (rDEP3), investment loan rate



( $rINV$ ), total investment ( $INV$ ), output ( $GDP$ ), and inflation ( $CPI$ ). Meanwhile, substitution/income effect channel includes endogenous variables SBI rate ( $rSBI$ ), 3-month deposit rate ( $rDEP3$ ), private consumption ( $pvtCONS$ ), output ( $GDP$ ), and inflation ( $CPI$  inflation and core inflation).

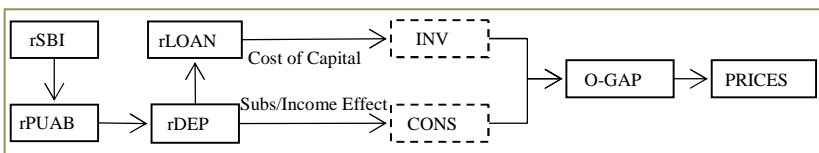
FIGURE 8  
Interest Rate Channels Model from Astiyah (2005)



Theresults show the existence of interest rate channels through cost of capital and substitution/income effect, which work well as expected. Interest rate channel through cost of capital show stronger response than that of interest rate channel through substitution/income effect. Changes in monetary policy are responded by deposit rate in 3 months. The impact of monetary policy to inflation through interest rate channel requires 18 to 32 months. Moreover, 50% of inflation variability can be explained by SBI rate.

Natsir (2008) models interest rate channels as illustrated below in Figure 9, which implicitly includes cost of capital and substitution/income effect, excluding investment and consumption.

FIGURE 9  
Interest Rate Channels Model from Natsir (2008)



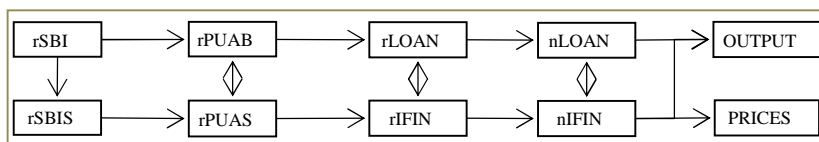
The endogenous variables included in the interest rate model are: SBI rate ( $rSBI$ ), interbank money market rate ( $rPUAB$ ), deposit rate ( $rDEP$ ), loan rate ( $rLOAN$ ), output gap ( $O-GAP$ ) and core inflation ( $INFL$ ). The results show that monetary policy transmission mechanism works well through interest rate channel and require ten quarter to pass through final objective (inflation). Responses of all

variables in this channel to the shock of policy rate (rSBI) are relatively strong, while the variability of inflation can be explained 63.11 percent by rPUAB as operational target of monetary policy in Indonesia.

Moreover, studies on Islamic monetary policy transmission mechanism (IMPTM) through return (as an alternative to interest) channel have started to emerge, such as studies by Ascarya (2010) and ‘Ayuniyyah, Achsani, and Ascarya(2010), both for the case of Indonesia. Although these studies do not specifically investigate profit channel of IMPTM, the existence of profit channel of IMPTM (through cost of capital) can be identified.

Ascarya (2010) investigates MPTM under dual financial system, using Vector Error Correction Model (VECM) method, which can be illustrated as follows in Figure 10.

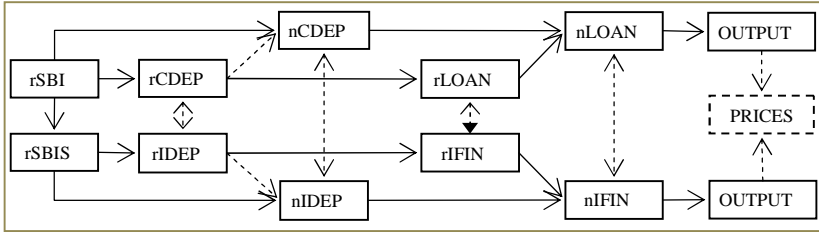
FIGURE 10  
MPTM under Dual Financial System from Ascarya (2010)



The results show the existence of both interest and return channels of MPTM. Conventional MPTM from conventional policy rate are all linked to inflation and output, while Islamic MPTM from Islamic policy rate is only partially linked to output. Interest rate, credit and conventional interbank rate shocks give negative and permanent impacts to inflation and output, while PLS, financing and Islamic interbank PLS shocks give positive and permanent impacts to inflation and output. SBI (Central Bank Certificate) as conventional policy rate and SBIS (Central Bank Shariah Certificate) as Islamic policy rate give similar impacts to inflation (positive) and output (negative), since SBIS rate is benchmarked to SBI rate.

‘Ayuniyyah et al. (2010) also investigate MPTM under dual financial system, combining bank lending or financing and interest or profit channels, using VECM method, to see its impact on output, which can be illustrated as follows in Figure 11.

FIGURE 11  
MPTM under Dual Financial System from ‘Ayuniyyah, Achsani, and Ascarya (2010)



The results show that conventional interest rate (rLOAN) has negative effect on output, while Islamic PLS(rIFI)N has positive effect on output. SBI does not give significant impact on output, so that it should not be benchmarked by SBIS. There exists displaced commercial risk in Indonesian dual banking system.

### 3. RESEARCH METHODOLOGY

#### 3.1 THE METHODS

Three quantitative methods will be applied simultaneously in this study, namely, Error Correction Model (ECM), Autoregressive Distributed Lag (ARDL), and Vector Error Correction Model (VECM) to obtain more robust results.

An Error Correction Model (ECM) is a time-series econometric dynamic system with the characteristics that the deviation or error of the level state from its long-run relationship will be fed into its short-run dynamics. ECM requires that the underlying variables are stationer at first difference or I(1) but there exists cointegration(s) between/among variables. The general equation of ECM can be illustrated as follows in (9):

$$(9) \Delta y_t = \alpha_0 + \sum_{i=1}^p \alpha_i \Delta x_{it} + \gamma(y_{t-1} - \beta_0 - \sum_{i=1}^p \beta_i x_{it-1}) + \varepsilon_t$$

where,  $y$  is dependent variable, which is either economic growth or inflation;  $x_p$  is  $p$  selected independent variables, specific for each model; and  $\varepsilon_t$  is disturbance or error term with zero means and constant variance-covariance. Moreover,  $\alpha_t$  are short-run coefficients,  $\beta_t$  are long-run coefficients and  $\gamma$  is a speed of adjustment coefficient, known as *error correction term* (ECT), where  $-1 < \gamma < 0$ .

An Autoregressive Distributed Lag (ARDL) is a time-series econometric model for the analysis of long-run relations when the underlying variables are stationer at first difference or I(1) but there exists cointegration(s) between/among variables. Optimum different number of lag(s) of each variable will be added to the equation. The general equation of ARDL can be illustrated as follows in (10):

$$(10) \quad y_t = c_0 + \sum_{i=1}^p \delta_i y_{t-i} + \sum_{j=0}^q \delta_j x_{1t-j} + \sum_{k=0}^r \delta_k x_{2t-k} + \dots + \sum_{l=0}^z \delta_z x_{n-t} + \varepsilon_t$$

Meanwhile, a vector error correction model (VECM) is a vector autoregressive (VAR) multifactor model which adds error correction features to the model. The general equation of VECM can be illustrated as follows in (11):

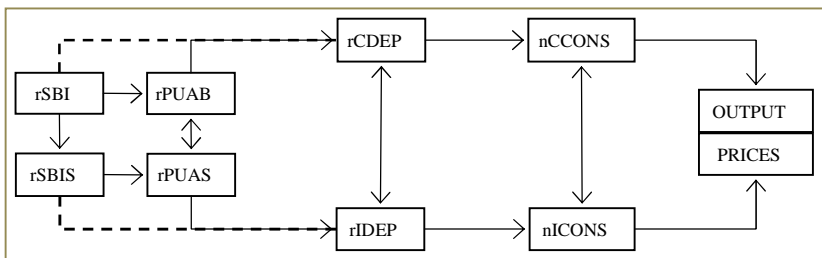
$$(11) \quad \Delta x_t = \alpha + \beta x_{t-1} + \sum_{i=1}^{k-1} \Gamma_i \Delta x_{t-i} + v_t$$

where,  $x_t$  is  $t$  selected endogenous variables, specific for each model and  $v_t$  is disturbance or error term with zero means and constant variance-covariance. Moreover,  $\alpha$  and  $\beta$  are functions of  $A_i$ . The matrix  $\beta$  can be decomposed into two matrices  $\alpha$  and  $\gamma$  with  $(n \times r)$  dimension.  $\alpha = \gamma \alpha$ , where  $\alpha$  is called an adjustment matrix and  $\gamma$  is a cointegration vector, and  $r$  is a cointegration rank.

### 3.2 THE MODELS

The model that will be used in this study is income effect of interest-profit channels of dual MPTM, which can be illustrated as in Figure 12:

FIGURE 12  
Income Effect of Interest-Profit Channels of MPTM under Dual Financial Systems



rSBI: rate of SBI; rSBIS: return SBIS; rPUAB: rate of conventional interbank money market; rPUAS: return of Islamic money market; rCDEP: interest on conventional deposits; rIDEP: return on Islamic deposits; nCCONS: total amount of

conventional consumption spending; nICONS: total amount of Islamic consumption spending; OUTPUT: industrial production index; PRICES: consumer price index.

The interest/profit channel through income effect models of ECM and ARDL can be expressed simply as follows.

Conventional income effect of interest channel models:

- 1)  $IPI = f(nCCONS, rCDEP, PUAB, SBI)$ ; and
- 2)  $CPI = f(nCCONS, rCDEP, PUAB, SBI)$ .

Islamic income effect of return rate channel models:

- 1)  $IPI = f(nICONS, rIDEP, PUAS, SBIS)$ ; and
- 2)  $CPI = f(nICONS, rIDEP, PUAS, SBIS)$ .

Dual income effect of interest/profit channel models:

- 1)  $IPI = f(nICONS, nCCONS, rIDEP, rCDEP, PUAS, PUAB, SBIS, SBI)$ ; and
- 2)  $CPI = f(nICONS, nCCONS, rIDEP, rCDEP, PUAS, PUAB, SBIS, SBI)$

Meanwhile, the interest/profit channel through income effect models of VECM can be expressed simply as follows.

Conventional income effect of interest channel models:

- 1) Output:  $x_t = [IPI, nCCONS, rCDEP, PUAB, SBI]$ ; and
- 2) Price:  $x_t = [CPI, nCCONS, rCDEP, PUAB, SBI]$

Islamic income effect of profit channel models:

- 1) Output:  $x_t = [IPI, nICONS, rIDEP, PUAS, SBIS]$ ; and
- 2) Price:  $x_t = [CPI, nICONS, rIDEP, PUAS, SBIS]$ .

Dual income effect of interest/profit channel models:

- 1) Output:  $x_t = [IPI, nICONS, nCCONS, rIDEP, rCDEP, PUAS, PUAB, SBIS, SBI]$ ; and
- 2) Price:  $x_t = [CPI, nICONS, nCCONS, rIDEP, rCDEP, PUAS, PUAB, SBIS, SBI]$ .

Where, rSBI: the rate of Bank Indonesia Certificate (SBI) or Policy Rate (since April 2008), obtained from table I.25, SEKI-BI; rSBIS: the rate of Bank Indonesia Wadiah Certificate (SWBI) or Bank Indonesia Shariah Certificate (SBIS), obtained from table I.25, SEKI-BI; rPUAB: the rate of one-day conventional interbank money market, obtained from table I.25, SEKI-BI; rPUAS: the rate of one-day Islamic money market, obtained from table I.25, SEKI-BI; CPI: the index of monthly CPI (consumer price index) inflation obtained from table "Indeks Harga Konsumen dan Inflasi Bulanan Indonesia", BPS; IPI: the index of monthly IPI (Industrial Production Index) obtained from table "Indeks Produksi Bulanan Industri Besar dan Sedang, 2003-2011", BPS; rCDEP: the rate of one-month conventional time deposits; rIDEP: the rate of one-month Islamic

time deposits (depositoiB), SPS-BI; nCCONS: the outstanding amount of conventional bank consumption loan, SEKI-BI; and nICONS: the outstanding amount of Islamic bank consumption financing, SPS-BI.

#### 4. RESULTS AND ANALYSIS

##### 4.1 PRELIMINARY TESTS

Several preliminary tests are required including unit root test, stability test, optimum lag test, and cointegration test. Unit root test is used to determine whether data (variable) is stationary in level or stationary in first difference. 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. The results of stationary tests of all variables can be seen in Table 1. Using 5 per cent McKinnon critical value, there are only three variables that stationary at level (lnnCCONS conventional consumption, rPUABconventional money market rate, and rIDEP Islamic deposit rate of return). However, all variables are stationary at first difference.

TABLE 1  
Stationary Test of Income Effect of Interest-Profit Channels of  
MPTM under Dual Financial Systems

Variable	ADF Test Statistics		PP Test Statistics	
	P-Value (Level)	P-Value (1st Diff)	P-Value (Level)	P-Value (1st Diff)
LNNCINV	0.8088	0.0000*	0.8088	0.0000*
RCDEP	0.0246*	0.0008*	0.5578	0.0003*
RCINV	0.2721	0.0000*	0.2470	0.0000*
LNNCCONS	0.0000*	0.0000*	0.0000*	0.0000*
RPUAB	0.0000*	0.0000*	0.0000*	0.0000*
RSBI	0.1024	0.0013*	0.4948	0.0012*
LNNIINV	0.9990	0.0000*	0.9980	0.0000*
RIDEP	0.0000*	0.0000*	0.0000*	0.0000*
RIINV	0.0664	0.0000*	0.0664	0.0000*
LNNICONS	0.4682	0.0000*	0.4072	0.0000*
RPUAS	0.0472*	0.0000*	0.0735	0.0000*
RSBIS	0.1814	0.0000*	0.2342	0.0000*

\*Significant at 5 per cent level using McKinnon critical value.

Other tests show that all models (CPI and IPI models for conventional, Islamic and dual systems) are stable, have 1-3 optimum lags, and have 1-3 cointegrated equations.

4.2 GRANGER CAUSALITY RESULTS

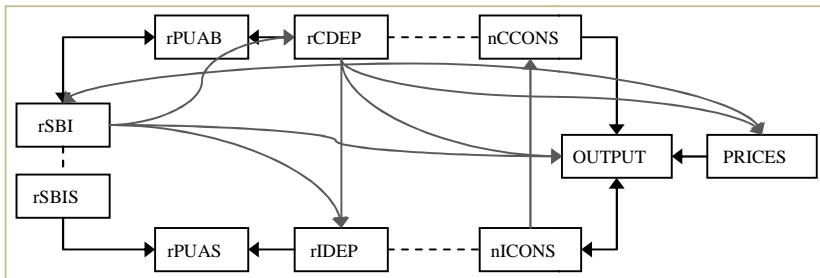
Complete Granger causality test can be seen in the Appendix, Table 2. Granger causality summary results in Figure 13 show that all income effect channels (conventional and Islamic) have broken causality link to OUTPUT (economic growth) and PRICES (inflation). Broken causality links exist between variables of financial sector and variables of real sector, which indicate the existence of decoupling between financial sector and real sector. Inflation and conventional monetary policy rate (rSBI) have two-way causalities, which means that conventional monetary expansion (contraction) will cause inflation to increase (decrease), and conversely, inflation increase (decrease) will cause conventional monetary policy contraction (expansion). The rate of conventional deposits (rCDEP) also granger causes economic growth and inflation. Consumptions (nCCONS, nICONS) cause economic growth.

TABLE 2  
Granger Causality Results

DEPENDENT VARIABLES	LNNICONS	LNPI	RSBI	LNNCCONS	RSBIS	RCDEP	RPUA	RPUAB	RIDEP	LNCPI
LNCPI	0.97	14.65	10.77	2.72	1.61	0.81	1.11	0.26	0.31	
LNPI			1.53	1.02	1.04	0.13	0.49	1.68	1.00	2.49***
LNNCCONS	0.50	4.37**	1.72		0.37	0.18	0.49	0.06	0.14	2.05
LNNICONS	4.78**	3.90**	2.18	8.47*	1.09	0.72	1.09	0.12	0.04	1.13
RCDEP	0.50	3.92**	3.29**	0.45	1.68		1.64	8.14*	6.42*	8.63*
RIDEP	1.17	0.80	0.04	0.12	0.67	0.22	3.90	1.29		0.16
RPUAB	0.05	0.93	3.15**	0.07	0.72	11.82*	0.41		0.90	2.77***
RPUAS	2.56***	2.65***	2.14	0.30	0.99	0.40		0.73	0.61	0.12
RSBI	0.37	4.40**		1.17	0.40	4.85**	0.27	6.37*	6.02*	7.38*
RSBIS	1.74	0.25	2.04	0.87		0.08	9.52*	0.84	0.98	0.01

\*/\*\*/\*\* Indicate significant levels at the 1 per cent, 5 per cent and 10 per cent respectively.

**FIGURE 13**  
**Granger Results of Income Effect Channels of MPTM under Dual Financial Systems**

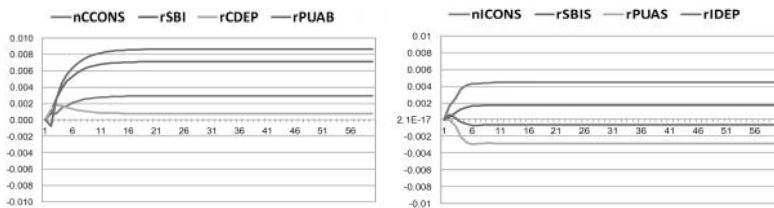


Note: Significant at 5 per cent level using McKinnon critical value.

### 4.3 VECM RESULTS

Impulse Response Function (IRF) results of independent interest and profit channels through income effect to inflation show that all conventional variables and two Islamic variables trigger inflation, where rPUAB and rSBI give the greatest impact followed by nICONS. Conversely, rPUAS and rIDEP lower inflation, illustrated in Figure 14.

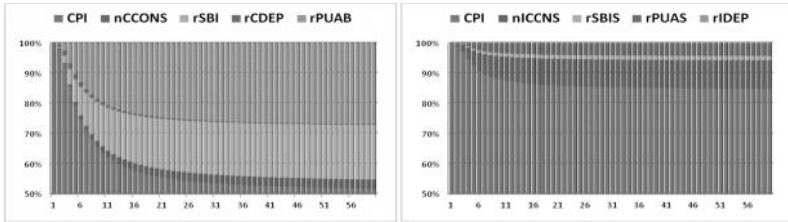
**FIGURE 14**  
**IRF Results of Conventional and Islamic Income Effect Channels to Inflation**



Forecast Error Variance Decomposition (FEVD) results of independent interest and profit channels through income effect to inflation show that conventional variables rPUAB (26.8 per cent) and rSBI (18.1 per cent) give the greatest share to raise inflation, followed by nICONS (9.5 per cent). Conversely, rPUAS gives 4.1 per cent share to lower inflation, illustrated in Figure 15.

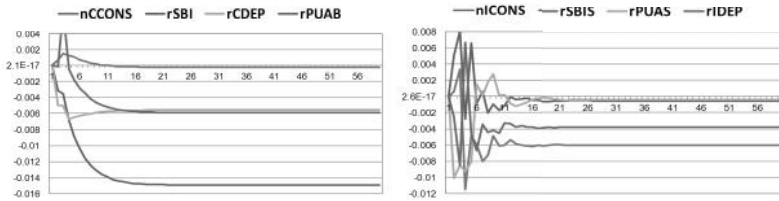


**FIGURE 15**  
FEVD Results of Conventional and Islamic Income Effect Channels to Inflation



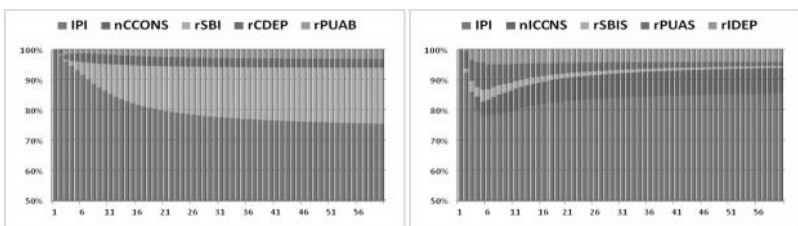
IRF results of independent interest and profit channels through income effect to output show that most conventional and Islamic variables lower output, where rSBI give the greatest impact followed by nICONS, rPUAB and rCDEP, illustrated in Figure 16.

**FIGURE 16**  
IRF Results of Conventional and Islamic Income Effect Channels to Growth



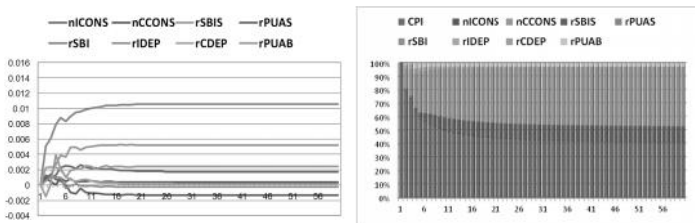
FEVD results of independent interest and profit channels through income effect to output show that conventional variable rSBI (18.5 per cent) and Islamic variable nICONS (8.5 per cent) give the greatest share to lower growth, illustrated in Figure 17.

**FIGURE 17**  
FEVD Results of Conv. and Islamic Income Effect Channels to Growth



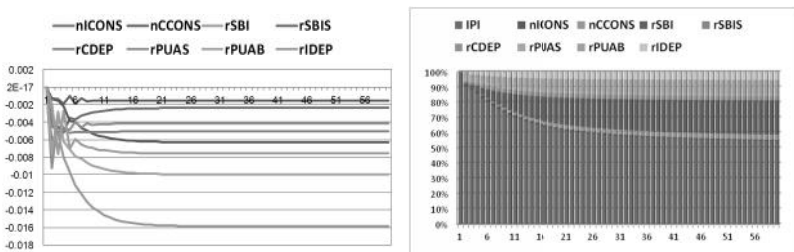
IRF results of dual interest-profit channels through income effect to inflation show that conventional variable rSBI and Islamic variable rSBIS trigger inflation, while rPUAS lowers inflation. Meanwhile FEVD results show that rSBI (43.6 per cent) gives the greatest share to raise inflation, followed by rSBIS (10.5 per cent), illustrated in Figure 18.

FIGURE 18  
IRF and FEVD Results of Dual Income Effect Channel to Inflation



IRF results of dual interest-profit channels through income effect to output show that conventional variable rSBI hinder growth, followed by rPUAB and rIDEF. Meanwhile FEVD results show that rSBI (22.4 per cent) gives the greatest share to decrease growth, followed by rPUAB (8.9 per cent) and rIDEF (5.2 per cent), illustrated in Figure 19.

FIGURE 19  
IRF and FEVD Results of Dual Income Effect Channel to Growth



#### 4.4 ESTIMATION RESULTS

ECM, ARDL and VECM estimation results of Interest-Profit channels (Income Effect) exists for conventional, Islamic and dual systems. Conventional system gives mostly expected results, where the increase of conventional consumption (nCCONS) will increase inflation and growth, while the increase of various conventional

interest rates (rSBI and rPUAB) will decrease inflation and growth. Islamic system gives some expected results (where Islamic return rSBIS and rIDEP will not induce inflation but increase growth) and some inconclusive results (where nICONS and rPUAS still induce inflation, while rPUAS decreases growth). Under dual system, most conventional variables give inconclusive results (nCCONS, rCDEP and rSBI), while most Islamic variables give expected results (nICONS, rPUAS and rSBIS), which are not induce inflation and accelerate economic growth. rPUAB (rSBIS) gives consistent results in conventional (Islamic) and dual systems.

Moreover, dummy inflation targeting framework (dumITF) also gives consistent unexpected results. The results show that the implementation of ITF has raised inflation in all systems. Variable dumITF in CPI model is always positive and significant both in conventional and Islamic systems (see Table 3), as well as in dual systems (see Table 4).

TABLE 3  
ECM, ARDL and VECM Estimation Results of Income Effect Channel

Variable	Conventional						Exp.Sign	
	CPI			IPI			CPI	IPI
	ECM	VECM	ARDL	ECM	VECM	ARDL		
nCCONS	0.2*	0.26*	0.005	0.08*	0.31*	0.07*	+	+
rCDEP	0.01	-0.04*	-0.001	-0.01	0.31*	0.06*	-	-
rPUAB	-0.002*	0.05*	-9E-04*	-0.001	-0.31*	-6E-04	-	-
rSBI	-0.01	-0.03	5E-04	-0.001	0.08	-0.08*	-	-
dumITF	0.13*	0.01*	0.02*	0.03	0.01	0.02		
dumOMO	0.08*	-0.004	0.01*	0.03	-0.001	0.03		
Variable	Islamic						Exp.Sign	
	CPI			IPI			CPI	IPI
	ECM	VECM	ARDL	ECM	VECM	ARDL		
nICONS	0.14*	0.41*	0.02*	0.08*	-1.37*	0.05*	?	+
rIDEP	3E-04	0.09	-0.003*	-0.01	0.13*	-0.003	?	+
rPUAS	0.005	0.8*	4E-04	-0.01	-0.38*	-0.004	?	+
rSBIS	0.002	-0.64*	6E-04	0.01	0.33*	0.001	?	+
dumITF	0.08*	0.002*	0.02*	-0.04*	-0.01	-0.01		
dumOMO	0.02	0.002	0.01	0.01	0.04	-0.01		
dumSBIS	0.03	-0.01		-0.01	-0.04			

\*Significant at 5 per cent level.

**TABLE 4**  
**ECM, ARDL and VECM Estimation Results of Income Effect Channel Under Dual Financial System**

Variable	Conventional						Exp. Sign	
	CPI			IPI			CPI	IPI
	ECM	VECM	ARDL	ECM	VECM	ARDL		
nCCONS	0.06*	-0.28*	0.01	-0.02	-0.46*	-0.01	+	+
rCDEP	0.004	0.02*	-0.002	-0.01	0.02	0.06*	-	-
rPUAB	-0.001	-0.01*	-8E-04*	-0.001	-0.03*	-4E-04	-	-
rSBI	-0.004	0.02*	0.001	-0.003	0.02	-0.09*	-	-
Variable	Islamic						Exp. Sign	
	CPI			IPI			CPI	IPI
	ECM	VECM	ARDL	ECM	VECM	ARDL		
nICONS	0.11*	-0.09*	0.01	0.06*	0.18	0.04	?	+
rIDEP	0.001	-0.02	2E-04	-0.001	-0.05*	-0.001	?	+
rPUAS	0.004	1E-04	7E-04	-0.01	0.003	-0.004	?	+
rSBIS	0.005	0.01	1E-05	0.01	-0.02	0.01	?	+
Dummy								
dumITF	0.08*	0.01	0.02*	0.02	-0.01	0.04		
dumOMO	0.01	0.01	0.01	0.04	-0.02	0.05		
dumSBIS	0.03	-0.01	0.005	-0.02	0.03	-0.02		

\*Significant at 5 per cent level.

## 5. CONCLUSIONS AND RECOMMENDATIONS

Granger results show that conventional interest and Islamic profit channels have broken causality links from financial sector to real sector, which indicate the existence of decoupling between financial sector and real sector. However, conventional policy rate has two-way direct link to inflation, where policy rate causes inflation, while inflation gives feedback to policy rate. Meanwhile, Islamic policy rate only causes Islamic money market.

Under conventional financial system, conventional policy rate (SBI) contributes 18.1 per cent share in inducing inflation and 18.5 per cent in curbing economic growth, while Islamic policy rate (SBIS) contributes only 1.4 per cent share in inducing inflation and only 0.4 per cent in curbing economic growth.

Under dual financial system, Impulse Response Function (IRF) results show that conventional policy rate (SBI), based on interest, increases inflation and decreases output, while Islamic policy rate (SBIS), based on *jull'alah*, slightly induces inflation and insignificantly decreases output. Forecast Error Variance Decomposition (FEVD) results show that conventional policy rate based on interest contributes 43.6 per cent share in inducing inflation and 22.4 per cent share in curbing economic growth, while Islamic policy rate based on *jull'alah* contributes 10.5 per cent share in inducing inflation and does not contribute to economic growth. IRF

and FEVD results suggest that conventional interest based financial system tends to increase inflation and decrease economic growth, while Islamic interest-free financial system tends to slightly increase inflation and tends to give insignificant impact to economic growth.

Further to that, estimates of ECM, ARDL and VECM show some interesting results. Under conventional financial system, the increase of conventional policy rate (SBI), based on interest, gives insignificant impact to inflation and tends to decrease economic growth. Under Islamic financial system, Islamic policy rate (SBIS), based on *juʿlāh*, tends to decrease inflation and tends to increase economic growth. Under dual financial system, the increase of conventional policy rate (SBI), based on interest, tends to increase inflation and tends to decrease economic growth, while the increase of Islamic policy rate (SBIS), based on *juʿlāh*, gives insignificant impact to inflation and economic growth.

Islamic policy rate SBIS mostly still gives dissatisfied results, since it is based on *juʿlāh* and is benchmarked to conventional policy rate SBI, so that SBIS should be improved using Profit-and-Loss Sharing (PLS) mode of finance, which reflects return in the real sector, to provide impact on macro-economic and price stability as well as sustainable economic growth. In addition, low and stable inflation and improved economic growth could be achieved under dual financial system by increasing the share of Islamic financial system, especially Islamic banking system.

In a country adopting dual financial system, real rate of return could be adopted to be used as policy rate, which is applicable for Islamic as well as conventional monetary system. Moreover, the adoption of Inflation Targeting Framework (ITF) since July 2005 has consistently increased inflation, so that it needs to be reconsidered.

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