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ANALYSIS OF MONETARY AGGREGATE RESPONSE: COMPARATIVE STUDY BETWEEN ISLAMIC AND CONVENTIONAL BANKING SYSTEMS IN INDONESIA

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Abstract

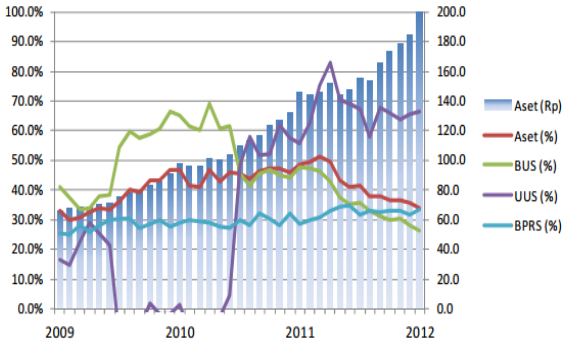
This research aims to examine which variables most influence the demand for money, and look at the stability of money demand, Islamic and conventional, in response to the shocks of other variables. The analysis method used using Vector Autoregression (VAR), if the data used is stationary at the first difference then the VAR model will be combined with the error correction model into the Vector Error Correction Model (VECM). Impulse response function analysis is also done to see the response of an endogenous variable to the shocks of other variables in the model. The results of this study explained that the shock of the inflation rate responded negatively to the request until the 8th day on sharia demand, while conventionally *The shock of the sharia inflation reward rate responded negatively on the 16th day while conventionally there was no response. The shock of the interest rate lift responded negatively on the 11th day on the conventional system while sharia did not respond. While GDP responded positively and stable on day 2 for the Sharia system, while the conventional system responded negatively until the 24th day. .*

Keywords: *inflation rate, inflation reward rate, interest rate, GDP.*

1. Introduction

With the islamic financial system that exists today, where most financial systems are still dominated by conventional systems, it takes an alignment so that both can make a large contribution in the economy. The above conditions further lead to the problem of how to synergize the two systems that have different characteristics in an institutional unity in order to obtain maximum benefits for the welfare of the community.

Nationally, the volume of Islamic banking business consisting of Islamic Commercial Bank (BUS), Sharia Business Unit (UUS) and Sharia People's Financing Bank (BPRS) increased by 34.0% (yoy) from Rp149.0 trillion in 2011, to Rp199.7 trillion in 2012 (Graph 1.1). The growth rate of business volume is lower than last year



(48.6%, yoy) and mainly experienced by the BUS group.

SOURCE:Lpps BI 2012

Graph 1.1 Development of Islamic Banking Assets

Despite the slowdown, the growth rate of Islamic banking assets remains higher than the growth of banking assets nationally, so the share of Islamic banking to the national banking

industry increased from 4.0% to 4.6%. In addition, asset growth

This is still followed by the implementation of intermediation of third-party funds collected which reached Rp150.5 trillion, to various financing segments optimally. This is reflected in the amount of financing that reached Rp151.1 trillion which drove the increase in financing to deposit ratio of Islamic banking, including in the BUS group from 86.7% in 2011 to 95.4% at the end of the report period. (LPPS BI, 2012).

When Indonesia was in a period of economic and monetary crisis in 1997-1998, Sharia Commercial Bank (BUS) was still able to show relatively better performance compared to conventional financial institutions. Until the end of September 1998 there were as many as 55 troubled banks and all of them were conventional banks (Perwataatmaja, 2002). At that time, Bank Muamalat itself still survived without the help of funds from the government. Therefore, it is quite a reason to see Islamic banking as an alternative financial institution.

The absence of interest rate instruments in all activities of the Islamic financial system has been replaced by the concept of revenue sharing. This is the only difference between the conventional financial system and the Islamic financial system in contemporary times in Indonesia. The contemporary Islamic financial system still uses conventional fiat money and still implements the fractional reserve banking system. This reality can be understood considering that the Islamic financial system in Indonesia is still dominated by the power of a large conventional system within the framework of a dual banking system. Theoretically, researchers who pay attention to the development of the Islamic financial system, show that the concept of revenue sharing is better than the interest rate instruments used by conventional financial systems in terms of fairness, reduction of speculation activities, resource efficiency, and others. (Ascarya, 2007; Sakti, 2007). Therefore, it must be empirically proven that in the absence of interest rate instruments in the Islamic financial system **replaced by this revenue-sharing concept can support the dual financial system as a whole, particularly in the study of money demand and** monetary stability in the dual banking system. In this study will be examined which variables most affect the demand for money, and look at the stability of the demand for money, Islamic and conventional, in response to the shocks of other variables.

2. Literature

In fact, in this world more countries implement a dual banking system than countries that implement the Islamic banking system in full, but it turns out that studies that specifically discuss the framework, management, and operation of monetary policy in the financial system / double banking are very little done. Some of these studies include Kaleem.
(2000), Darrat (2000), Kia (2001), Astiyah et al. (2006), Ascarya (2007), Hasanah, Ascarya, Achsani (2008), and Izhar and Asutay (2007).
Kaleem (2000) conducted research on monetary stability on the dual banking system in Malaysia. Kaleem estimates the demand for conventional and Islamic money but eliminates interest rate variables in conventional money demand and does not add Sharia return variables in islamic money demand.

The results showed that the demand for conventional money is tantamount to the demand for Islamic money, which is not resistant to shocks. His research also showed that the monetary aggregates of M1 and M2 are both conventional and Islamic in relation to price levels.

Based on research in Iran and Pakistan using data from 1960-1998 (Darrat, 2000) and the period 1966-1998 (Kia, 2001) shows that interest free has a strong relationship with policy instruments and price stability (Darrat, 2000). In both the short and long term, demand for money in interest-free (M1) is stable and invariant to policies and other shocks in regime change, while demand for money in interest bearing (M2) is unstable (Kia, 2001). The study also showed that the behavior of economic agents towards interest-based assets is likely to be forward looking so that the expectations are rational for Iran's financial

markets. Or to say, that the coefficient of demand for money using interest is not affected by policy changes (Kia, 2001).

Astiyah et al. (2006) conducted a conceptual study which was further formulated to obtain the most suitable approach to describe the behavior of the monetary system in a double banking system. This study concluded that with the non-permissible use of interest rates in Islamic economics, the implementation of monetary policy taken should tend to the complete quantity targeting by prioritizing consistency between Sharia instruments and conventional instruments and paying attention to the principle of equality to both conventional and Islamic banking types.

Ascarya (2007) conducted an analytical descriptive study of optimum monetary policy on the dual banking system. The results suggest that the optimum monetary policy in a country adopting a dual banking or financial system should refer to the rate of return on the revenue-sharing system to maximize distributive fairness and social welfare and minimize inefficiencies.

Hasanah, Ascarya, Achsani (2008) looks at the behavior of monetary aggregates in the dual banking system in Indonesia. The results showed that for conventional money demand models, GDP has a positive effect on demand.

Money is significantly, inflation rates have a negative effect, and interest rates are insignificant. As for the islamic money demand model, GDP has a positive effect, the inflation rate and the return of Shariah negatively affect the demand for Islamic money. And with the absence of cointegration in the analysis of the relationship of the money supply to the price level, in the long run there is not enough empirical evidence to show a relationship between the money supply of both conventional and Islamic and the price level.

Izhar and Asutay (2007) conducted research also on monetary stability in the dual banking system in Indonesia, from 2001 to 2004. The results showed that neither the long-term equation nor the conventional M2 and M2 Islamic variable error correction equations had a significant relationship with price levels. But the value of error correction term (ECT) in conventional systems is greater than the error correction term (ECT) in the Islamic system.

The difference between this study and previous studies is in the conventional money demand function that still includes interest rate variables, while in the Islamic demand function is included sharia return variables with longer time series coverage, namely from the first quarter of 2008 to the second quarter of 2015.

3. Analytical Methods

The problems in this study will be analyzed using Vector Autoregression (VAR). Then if the data used is stationary at the first difference then the VAR model will be combined with the error correction model into the Vector Error Correction Model (VECM). Mathematically, the general model can be formulated as follows:

(1) For the demand for conventional real money balance, the study refers to Goldfeld and Sichel's models in Hasanah, Ascarya, Achsani (2008) are:

$xt = \mu t + \sum Aixt\text{-}I + ut$

Ln M1t = a0 + a1 PDBt + a2 SBIt + a3 INFt + εtwhere M1 is the demand for money, GDP real output value, SBI interest rate, and INF inflation rate. xt is the vector of dimensional endogenous variables (n ×1), μt is the vector of exogenous variables including constants and trends, Ai is the matrix of dimensionless coefficients (n × n), and ut is the vector of residuals that is contemporarily correlated but not correlated with their own lag values and all the variables that exist on the right side of the equation**.**

(2) As for the demand for Islamic money in the dual banking system, the model refers to Kaleem (2000) in Hasanah, Ascarya, Achsani (2008), with add sharia reward /return rate in lieu of interest rates, so that it can be formulated as follows:

Ln M1ISLt = b0 + b1 PDBt + b2 RDEPt + b3 INFt + εt

with M1ISL is a request for Islamic money and RDEP sharia reward /return level.

Impulse response function analysis is also done to see the response of an endogenous variable to the shocks of other variables in the model. Variance decomposition analysis is also done to look at the relative contribution of a

variable in explaining the variability of its endogenous variables. All data in the study was transformed into a natural logarithm (ln) except interest rates, rate of return, and inflation rate to obtain more valid and consistent analysis results.

4. Discussion

Empirical Results of Islamic M1 Demand Model Based on the results of data processing on Islamic M1 demand, in the long run the GDP variable significantly positively affects the demand for Islamic M1. The inflation rate has a positive effect and the sharia reward rate significantly negatively affects the demand for Islamic M1 money. This can be interpreted that in the request of M1 Islam also people are still considering the opportunity cost in holding money. When the demand for Islamic M1 rises, then the inflation rate increases because when the money supply in large societies, this will trigger a price increase. This happens because the inflation rate (expectation) is the expected real rate of return from holding money (Mankiw, 2007)Whereas when the rate of Sharia rewards increases, then people will choose to invest their money into the form of assets that provide returns on Islamic banking. Theoretically in Islam, actually a person's willingness to invest should not look at the level of return, but indeed on the awareness of not to silence the funds they have. But in the long run this can be explained considering that public knowledge about sharia

M1 Islam	
Jangka Pendek	
Variabel	**Koefisien**
CointEq1	**-0.169597**
D(LNM1ISL(-1))	**-0.591018**
D(LNM1ISL(-2))	**-0.260233**
D(LNPDB(-1))	**3.441561**
D(LNPDB(-2))	**3.474387**
D(RDEP(-1))	0.006353
D(RDEP(-2))	0.000638
D(INF(-1))	**0.021619**
D(INF(-2))	**0.010525**
Jangka Panjang	
LNPDB(-1)	**0.957497**
RDEP(-1)	**-0.044415**
INF(-1)	**0.187134**

economy is still lacking

Table Vecm Estimate Results of Islamic M1

In the short-term analysis for Islamic M1 requests, there was a statistically significant correction of errors of 0.169597. This means that each error period is corrected by 0.169597% to go to long-term equilibrium. In addition, in the short term there are also several variables that statistically significantly affect the demand for Islamic M1.These variables include the demand for Islamic M1 in the first and second lags, GDP in the first and second lags and inflation rates in the first and second lags.

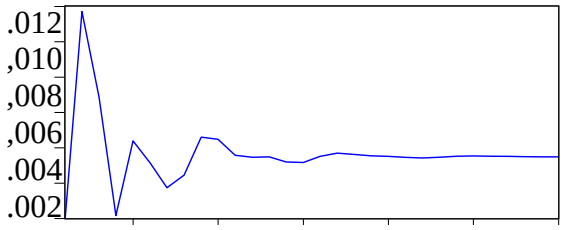
In the short term, for the demand of Islamic M1, it turns out that the level of Sharia rewards has no significant effect on the demand for money. This means that in the short term, sharia reward rates do not affect people's preferences in holding money. This can indeed happen considering people can't see if the rate of return received goes up or down. Because the face value that can be seen is only the ratio for the result not the return. Sharia's own level of rewards is uncertain because it adapts to conditions in the real sector.

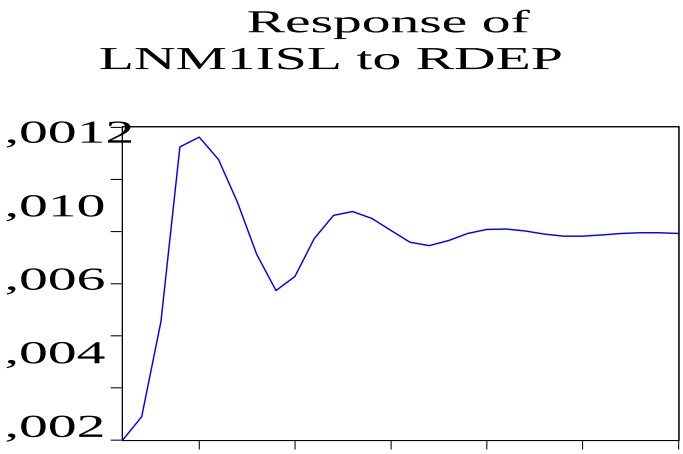
Impulse Response Function for Islamic M1 requests

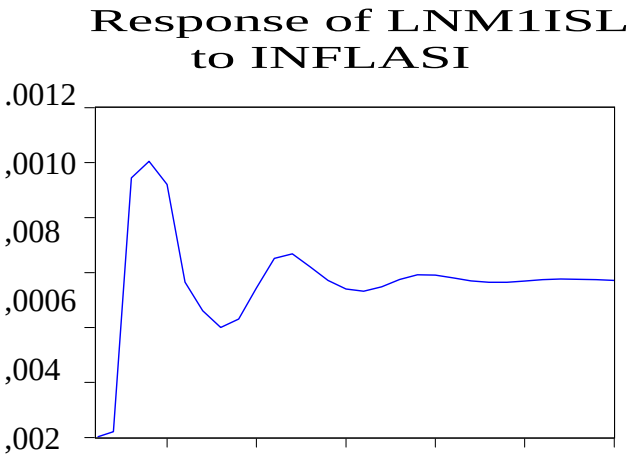
In Figure 1 it is seen that islamic M1 demand is more quickly stable in response to other variable shocks. But in the early days of the period, its response to other variable shocks was quite sharp. In the sixth period the shock at the islamic M1 demand responded positively and then stabilized. While the response of the GDP variable shock

responded positively and stable after the twenty-second period. The response of the reward rate variable in the negative response to the twenty-first period is then stabilized with a positive response after the twenty-first period. And the shock of the variable inflation rate responded negatively until the eighth period after which the demand for M1 Islam was positive and stable.

Figure 1 Islamic M1 Demand Response to Variable Shocks of GDP, Reward Rate, and Inflation RateResponse to Cholesky One S.D. InnovationsResponse of LNM1ISL to LNPDB



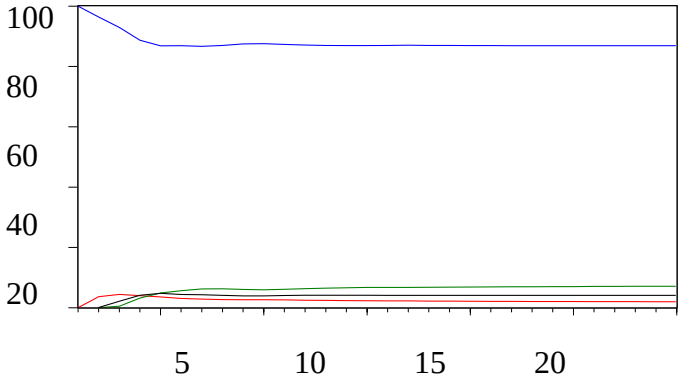




Analysis of Forecast Error Variance Decomposition (FEVD)

This analysis serves to predict the contribution of each variable to the shock or change of a particular variable.

Figure 2 Variance Decomposition Request M1 Islam



For each forecasting period, innovation in the demand for Islam's own still dominant M1 contributed the most in explaining the variability of Islamic M1 demand.

The influence of GDP, inflation rate, and reward rate is not dominant in explaining the variability of Islamic M1 demand, in accordance with the concept of Sharia economy.

Empirical Results of Conventional M1 Demand Model

From data processing, in the long term the GDP variables have a significant positive effect on conventional M1 demand. Variable inflation rates significantly positively affect conventional M1 demand. As for the variable interest rate affects tatisti against the demand of M1 but not significantly. This carries the implication that empirically interest rates do not show a significant relationship with M1 demand.

In the short term, for M1 requests, there is a tatisti but tatistically insignificant error correction so there is not enough evidence to suggest the existence of a mechanism of adjustment from the short to the long term. In the

short-term M1 demand model, interest rates on the third lag positively affect M1 demand.
Impulse Response Function for Conventional M1 requests

Conventional M1 demand response to other variable shocks is variable. M1 demand responds positively to the M1 demand variable itself, and stabilizes after the eighth period. While the shock on the GDP variable responded positively and stable after the twenty-fourth period. The interest rate variable responded negatively and the inflation rate variable responded positively by conventional M1 demand. M1 demand can be said to be stable in response to interest rate shocks after the eleventh period, with an average response of 0.57 percent. While M1 demand began to stabilize in response to inflation rate shocks after the 29th period.

Analisis *Forecast Error Variance Decomposition* (FEVD)

*As seen in figure below, fluctuations in M1 are most dominantly influenced by the demand for M1 itself, while interest rates follow in second place starting in the sixth period. While inflation variables and GDP variables do not greatly affect the variability of M1 demand. In the first period, fluctuations in the M1 demand variable were affected by the M1 shock itself by 100 percent. At forecasting intervals in later periods, the effect of M1 demand shocks itself decreases to the variability of M1 demand, but is still dominant.*Comparison of Conventional Money Demand and Islamic Money Demand

The interest rate shock (SBI) exerted a negative average effect on M1 (LNM1) demand, and became stable after the 36th period. While the shock of sharia reward / return level (RDEP) member negative and stable average influence after the 27th period. Conventional M1 demand reaches longer stability with a greater initial magnitude.

Interest rates exert considerable influence in the behavior of conventional M1 demand compared to sharia returns to Islamic M1 demand behavior. Thus, it means that conventional M1 demand is more influenced by fluctuations in interest rates, whereas Islamic M1 demand is less influenced by fluctuations in Sharia return.

5. Conclusion

In the islamic money demand model, in the long run, the variables of GDP and inflation rate have a positive effect, as well as the rate of sharia rewards negatively and significantly on the variable demand for Islamic money. And in the short term, the variable rate of sharia rewards has no significant effect on the variable demand for Islamic money, this is because in Islamic economics, people's behavior in using money, saving and channeling money, is not influenced by the magnitude of the level of rewards, but rather to look at the magnitude of the ratio that is assigned when a certain transaction is contracted.

While in the conventional money demand model, in the long run the variables of GDP and inflation rate have a positive and significant effect.

Conventional money demand variables, and interest rate variables negatively affect conventional money demand variables but are not significant. In the short-term M1 demand model, interest rates in the third lag positively affect M1 demand, and there is a negative but statistically insignificant correction of errors so there is not enough evidence to suggest a mechanism of adjustment from the short to the long term.

While the prediction of the contribution of each variable to the shock or variable demand for money both Islamic and conventional is that seen interest rate variables have a considerable influence in the behavior of conventional M1 demand compared to sharia return to islamic M1 demand behavior. Thus, it means that conventional M1 demand is more influenced by fluctuations in interest rates, whereas Islamic M1 demand is less affected by fluctuations in Sharia return.

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