CHAPTER 6

CONCLUSION

6.1 Introduction

The analyses of this study have filed evidence on the role of narrow money $M1$, currency in circulation and demand deposits. From the overall results it can be seen that narrow money does play a crucial role in influencing the inflation rate of various commodity products ranging from food to transport to recreation. It is found that there is a positive relationship between narrow money and inflation rate. The results show that narrow money has significant impact on the price of food. Why on food? Through a research by Clement and Chen (1996), it was found that the affluence of a country determines the amount of budget allocated for food. It is found that food dominates the budget of all consumers especially in LDCs compare to OECD countries. Thus, it is reasonable to understand Malaysia, being a developing country, would probably have a higher budget allocation for food. Therefore when there is an increase in money supply, demand for food would increase and thus will affect the price level of food.

While the evidence shown that there is a relationship between narrow money and inflation, the direction of the relationship between narrow money and output is unclear. Firstly, this is so because the results suggest that there is a negative relationship between narrow money and output. This is not significant to the theoretical sign (positive) of relationship between money and output. Nevertheless through the distributed lag models, it is found out that output might be the leading variable and thus a fall in output will be followed by an increase in money supply to stimulate the economic growth. This means that money could be an endogenous variable instead of an exogenous variable. Then if this is the case, the negative relationship between narrow money and output is understandable. By using the Granger Causality test to examine the endogeneity or exogeneity of money, the results also suggest that there is no clear directional link between narrow money and output, i.e. not all the components of IIP have the same direction of relationship with money.

6.2 Narrow Money and Inflation

6.2.1 OLS Regression of Inflation on Narrow Money

From the OLS regression of changes in $M1$ and inflation, there are only four out of nine components of CPI that have significant relationship with changes in $M1$. These components are Total CPI, Food CPI, Transport CPI and Medical Care CPI with Food CPI being the most responsive to changes in $M1$. A one percent increase in $M1$ will leads to 0.045 percent increase in inflation rate of Food CPI. The OLS regression of currency in circulation and inflation shows that four out of nine components of CPI have significant relationship with changes in currency in circulation. They are the Total CPI, Food CPI, Gross Rent CPI and Miscellaneous CPI. Food CPI is the most responsive to changes in currency in circulation that is a 1 percent increase in CU will leads to a 0.02 percent increase in inflation rate of Food CPI. Lastly, the OLS regression of demand deposits and inflation rate shows that Total CPI, Food CPI, Beverage CPI and Transport CPI have significant relationship with changes in demand deposits. Beverage CPI is the most responsive towards changes in demand deposits. That is a one percent increase in demand deposits will leads to 0.05 percent increase in inflation rate of Beverage CPI.

These analyses on the three components of narrow money show that individual components of narrow money have affected only 4 out of the total components of CPI. The magnitude of influence of narrow money towards inflation seems to be greater in $M1$ and DD (base on the most responsive changes of the above CPI components towards changes in narrow money). Inflation rate of Food CPI is affected by all the components of narrow money. Transport CPI is affected by $M1$ and demand deposits. Food CPI is therefore the most responsive components towards changes in narrow money.

6.2.2 Rolling Regression

The results of rolling regression show that the coefficients of *M1*, *CU* and *DD* have fallen over the years. This could be due to the fact that the role of narrow money has been assumed by some other forms of payments such as credit cards or *M2* and *M3*. In the appendix, there is an attachment showing the increasing amount of credit card usage over the past 9 years. Nevertheless this research is unable to further prove that this is the absolute reason. There is also another possible reason of the dwindling effect of narrow money on inflation rate of *CPI* components especially Food *CPI*. This reason is, when a developing country like Malaysia develops, there will be lesser budget being allocated to basic necessities goods (such as food)[1] and therefore the effect of narrow money on Food *CPI* becomes lesser.

6.2.3 Distributed Lag Model

When lag periods are introduced in the regression model, there seems to be more *CPI* components that are responsive towards changes in narrow money especially when the lag periods increase from 1-year to 5-years. Over the different lag periods, there are 7 components of *CPI* that have a significant relationship with *M1*, 8 components of *CPI* that have significant relationship with *CU* and 6 components of *CPI* that have significant relationship with *DD*. In this analysis, it seems that there are more *CPI* components, which are responsive towards changes in *CU* especially when lag periods are being introduced. The elasticity of *CPI* components at their maximum lag period towards changes in *M1* show that Miscellaneous *CPI* has the highest elasticity with a 0.53 percent increase when there is a 1 percent increase in *M1* followed by Gross Rent *CPI* and Food *CPI* which has an elasticity of 0.52 percent and 0.51 percent respectively. For *CU*, the most responsive *CPI* components towards changes in *CU* are the Miscellaneous *CPI* with the elasticity of 1.21 percent followed by Gross Rent *CPI* with the elasticity of 0.88 percent and Food *CPI* with an elasticity of 0.70 percent. The elasticity of Food *CPI* is the highest towards changes in *DD* that is Food *CPI* inflation changes 0.38 percent when there is a one percent increase in

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[1] According to Engel's Law, the income elasticity of basic necessities goods is less than one.

DD. Out of the 9 components of *CPI*, inflation rate of Recreation component is the least affected and not significant towards changes in *MI* and *DD*.

Comparing among the components of narrow money, currency in circulation seems to have greater influence on the inflation rate of most of the components, as the inflation rate of *CPI* components' elasticity towards changes in *CU* is higher. From the above analysis, it seems that inflation rate of Miscellaneous, Gross Rent and Food components have higher elasticity compare to other components. Inflation rate of Recreation component is not much affected. This is probably due to the style of living in developing country like Malaysia, for its households give less preference on recreational spending.

6.2.4 Granger Causality Test

Through the Granger Causality test, the general *TCPI* seems to have a unidirectional relationship with narrow money. The direction is from changes in narrow money to inflation except for *DD* (inflation to changes in *DD*). The unidirectional relationship from changes in narrow money to inflation rate is clearer in *MI* as most of the components of *CPI* have the same direction of relationship. In *CU* and *DD* the relationship is unclear. Thus it is difficult to determine the exogeneity character of both *CU* and *DD*.

6.2.5 Summary

The above analyses have proven that narrow money has a positive relationship with inflation rate. However, the impact of changes in narrow money on inflation has decline over the years. This could be due to the role of narrow money has been assumed by some other forms of payments such as credit cards or *M2* and *M3*. The most responsive component of *CPI* towards changes in narrow money is Food *CPI*. If taken lag periods into considerations, Miscellaneous *CPI* and Gross Rent *CPI* is also responsive towards changes in narrow money. The direction of narrow money to inflation rate is certain for *MI* but for *CU* and *DD* it is unclear. Overall, narrow money does play a significant role in influencing the inflation rate of the *CPI* components.

6.3   Narrow Money and Output

6.3.1   OLS Regression of Output on Narrow Money

For the regression of growth in output on changes in *M1*, there are 11 components out of 17 components of *IIP* that have significant relationship. But the relationship is negative that is the coefficients of *M1* do not approach statistical significance with the theoretical predicted (positive) signs in any of the regression except for the components of Beverage *IIP* and Petrol and Coal *IIP*.

The results of regression of growth in output on *CU* show that 10 components out of 17 components of *IIP* are significant towards changes in *CU*. But the outcome is the same as *M1* that is all these components have negative relationship with changes in *CU* except Beverage *IIP*. Growth in output of 7 components of *IIP* is significant with changes in *DD*. But the relationships are negative except for Petrol and Coal. Thus it looks like output is countercyclical towards growth in narrow money. Perhaps output might be the leading variable that is during periods when output falls, narrow money is increased to stimulate economic growth. This may serve as a reason of the negative relationship between narrow money and output.

6.3.2   Rolling Regression

From the rolling regression analysis, the coefficients of narrow money (*M1*, *CU*, *DD*) have dwindled over the years.

6.3.3   Distributed Lag Model

From the distributed lag model analysis for *M1*, *CU* and *DD* it is found that very few (in analysis of *CU*) or none of the components of *IIP* have a significant relationship towards the lag periods of *M1*, *CU* and *DD*. This serve as evidence that *IIP* could be the leading variable and not growth in narrow money.

6.3.4 Granger Causality Test

The results of Granger Causality test show that the general *IIP* seems to have a unidirectional relationship with narrow money. The direction is from changes in narrow money to growth in output. The unidirectional relationship from changes in narrow money to growth in output is clearer in *CU* as most of the components of *IIP* have this direction of relationship. In *M1* and *DD* the relationship is unclear. Thus it is difficult to determine the exogeneity character of both *M1* and *DD*.

6.3.5 Summary

The above analysis found that there is a negative relationship between narrow money and output. This implies that when narrow money increases there will be a fall in output. The result does not support the theoretical (positive) relationship between narrow money and output. However, it is found that output might be a leading variable and this may serve as a reason to explain the negative relationship. The negative impact of money has also declined over the years. If policy makers increase narrow money during periods when output falls, the falling magnitude of coefficients of narrow money could indicate that the policy makers could have switched to use other monetary aggregates such as *M2* and *M3* to stimulate economic growth. Other means of payment like credit cards can also take over the role of narrow money. From the Granger Causality test, no systematic pattern is to be found for the relationship between narrow money and output. Overall the direction of the relationship between narrow money and output is unclear.

6.4   Future Directions

Future research can be done more extensively when more data of credit cards are documented and published. This research only serves as a starting point to look into the effect of credit card via the studies on narrow money. If credit card can perform the same role as narrow money, if narrow money does affect inflation as proven in the above analysis, then it is possible for credit card to cause inflation as well. This is especially crucial as the increase in credit card usage is not necessary accompanied by an increase in productivity and income level of household. Thus future research can be done using credit card data to attest if credit cards have an impact on the economy.

In conclusion, monetary policy makers should take into consideration the effects of narrow money on inflation in the Malaysian economy[2]. Since narrow money does affect inflation in the Malaysia context and credit cards play the same function as narrow money, policy makers should therefore also scrutinize the amount of credit cards[3] issued every year.

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[2] Monetary policy makers can target on inflation but not on the output since there is an unclear relationship between narrow money and output.

[3] The dwindling effect of narrow money on inflation might also suggest that policy makers would have to increasingly regulate the issuing of credit cards in the economy if credit cards have increasing impact on the economy.