CHAPTER - 7

Conclusions:

We propose to first present conclusions of each chapter of the thesis. Some general conclusions and policy implications are then highlighted. The sample period of different chapters are slightly different and this has happened due to some data limitations. We believe that this will not, in a significant way, affect the comparisons of conclusions.

In the first chapter, we have examined the genesis of the medium of exchange function, store of value etc; however to resolve such issues finally from a theoretical point of view was beyond the scope of this study. What we have tried has been only a critical examination of such issues. Coming to empirical schemes for definition of money, we have outlined some of them and applied it also. In the second chapter on An Empirical Definition of Money for India, we have firstly attempted a time series analysis of various Monetary aggregates. In this context it may be noted that a major criticism against Chetty's (1969) study raised by Boughton (1977) has been that all studies so far have used unfiltered data on financial assets; nominal stocks are measured in current levels.
This practice may introduce spurious common trends in data series and thus bias upwards the estimated substitutability between them. That is why we have gone for deseasonalising, trend fitting and arriving at cyclical variations before examining the close movements of financial variables over time, through factor analytic criterion. Our study has shown that currency and demand deposits move very closely over time. From the opposite signs of the factor loadings one may infer that the substitutability criterion is also satisfied between currency and demand deposits. The important point is that we have been more or less able to identify a subset of assets which among themselves are having highly close substitutability and movements. They do not have any particular close substitutability with other broader financial liquid assets. The theoretical implication of this finding is more in line with the Quantity theory of money than with Keynesian theory. And it agrees with Broughton's (1977) results of the extended Chetty Model by relaxing the separability conditions while restoring homotheticity to the utility function, that there exists only weak substitutability between Money (narrowly defined) and other broader financial assets.
In the third chapter when direct Friedman-Mehdian test of money definition is applied, the narrow definition of money emerges as the best definition of money both from static and dynamic points of analyses.

In the fourth chapter it has been found that the generalised functional forms are significantly different from the a priori chosen linear and log-linear money demand functions. The specifications of the demand for money with income and long term interest rate as arguments, that assume complete adjustment between the actual and desired money balances with in a year, yield unstable econometric relationship. The generalised demand functions as well as the stability tests carried out for Generalised Functional Form (GFF) with varying parameter regression are insensitive to the particular definition of money. Both $M_1$ and $M_2$ yield equally stable demand for money with partial adjustment models. So selection of a particular definition of money should be based on other theoretical and empirical considerations. There are some other empirical results which may guide us in the choice of the particular money definition - (1) In India long term interest rates, and not short term rates, yield stable money demand functions
(2) Although the CEF is stable for both $M_1$ and $M_2$ definitions of money, the coefficient of interest rate variable in narrow money definition ($M_1$) is found to be statistically insignificant, especially in varying parameter regressions, while in the case of broader definition of money ($M_2$) all the parameter estimates including that of the interest rate are statistically significant with theoretically plausible signs. (3) In partial adjustment models the introduction of permanent income instead of current real income in narrow money definition ($M_1$) specifications increases the adjustment coefficient (i.e. reduces the decay coefficient in lagged adjustment models) while in the case of ($M_2$) broader money specifications introduction of permanent income reduces slightly the adjustment coefficient (i.e. increases the decay coefficient). From this we can tentatively suggest that the $M_1$ Money demand is affected by short term factors like expected real income as a proxy for transaction flows; while the demand for time deposits is more or less influenced by relatively long term factors such as asset formation and mainly may be a function of non-human wealth and demand for time deposits may be more closely linked with other broader liquid and relatively non-liquid financial
assets like government bonds, building, shares, loan association coupons, non bank financial intermediaries, liabilities etc., than with currency and time deposits. But this is of theoretical interest only in India. They also need further empirical research.

In the fourth chapter when the interest rate was taken as the opportunity cost variable, one of the implied assumptions was that the changes in the nominal interest rates adjust to changes in inflationary expectation. Suppose nominal interest rate does not adjust to inflationary expectation, or if there are lags in such adjustment, then there is some justification for taking inflationary expectation also in addition to interest rates, in money demand functions. On the other hand, if the real interest rate is constant, and nominal interest rates adjust fully to inflationary expectation, instead of interest rates, inflationary expectations can be used as the opportunity cost variable in money demand functions. Some of these implied hypotheses are considered testable hypotheses in chapter five by taking inflationary expectation as the opportunity cost variable. This has been also necessitated by other considerations such as the general belief that in India, paper securities
markets are not competitive and their rates are more or less administered, and also in India opportunity cost of holding money may be the holding of commodities of which the rate of return may be better approximated through inflationary expectation.

√ In the light of recent developments in monetary economics, it has been recognized that the variability of inflation can affect the demand for money and can have allocation effects in the economy. The results of the chapter five have shown that the variability of inflation is a significant variable and positively affecting the demand for money in India. However, the inflationary expectation though with correct negative theoretical sign, when varying parameter regression is used, its coefficients have more or less random behaviour and not stable over time. And when partial adjustment mechanism is postulated inflationary expectation becomes statistically insignificant. On the other hand, in equilibrium models, they are statistically significant. This, perhaps, shows that one of the reasons for partial adjustment when interest rate was taken as the relevant opportunity cost variable - may be the lag of adjusting interest rates to price or price expectations.
Anyway this part needs further research to ascertain the real causes for lag adjustment when long term interest was used as the relevant opportunity cost variable. In any case when income and long term interest rates are used as arguments we get stable demand for money functions, though with adjustment lags; whereas when income, inflationary expectation, and variability of inflation are used as arguments we do not get stable demand for money functions though income and variability of inflation are statistically significant and having expected theoretical signs. Two plausible reasons for this phenomenon are:

1. The assumption that the real interest rate is constant and that the nominal interest rates adjust fully to the inflationary expectation may not be valid.
2. Our modelling of inflationary expectation through adaptive expectation mechanism may be inadequate, particularly the adaptive expectation parameter itself may be a variable. The results of the chapter five are also insensitive to particular definition of money whether narrow ($M_1$) or ($M_2$) (broad definition of money).

In Chapters four and five, when the opportunity cost variable of demand for money function was cast either in terms of interest rate alone or inflationary expectations only, some indirect assumptions were made regarding the impact of inflationary expectations on nominal interest rates.
For example in chapter four, when the opportunity cost variable was cast in terms of interest rate only, the indirect assumption was that the nominal interest rates adjust to inflationary expectation and that too without time lag. In the fifth chapter, when inflationary expectation alone was cast as the opportunity cost variable the implied assumption was that real interest rate was constant. These assumptions are made testable hypotheses in chapter six. So a comprehensive study of the Fisher hypothesis regarding the relation between nominal interest rates and inflationary expectation has been made in chapter six. Fisher hypothesis of the positive relation between inflationary expectation and nominal interest, has been supported both in the case of short term rates like Bazar bill Rate and Call Money rates and comparatively long term rate like twelve month time deposit rate. In the case of short term rates, the coefficient for inflationary expectation is almost unity and the adjustment lag is not long. But in the case of 12 month time deposit rate the coefficient for inflationary expectations is less than unit, and there is some adjustment lag too; perhaps this may be one of the reasons for partial adjustment lag in our demand for money functions, when twelve month time deposit rate was used as the relevant opportunity cost variable. Other empirical evidences point to the implausibility of the assumption that the real interest rate is constant.
Friedman's hypothesis that the variability of inflation may reduce the efficiency of the price system and the productive apparatus of the economy, thereby lower the investment demand and real interest rate, is found to be verified for all interest rates in India. On the contrary, some of the empirical evidences point to the direction that the variability of inflation can raise the demand for money in a Harrodian sense, and raise the interest rates; because of the correlation between variability of inflation and inflationary expectation, it may sometimes inflate the coefficient of inflationary expectation with respect to interest rates. Hick's L.M. curve analysis i.e. the positive relation between real income and interest rates is empirically supported. When there is a positive relation between rate of change of income and inflationary expectation, if the economy is on the Phillips curve, the coefficient of the rate of increase of real income is expected to have a negative sign, as it reduces real interest rate through the savings side. But empirically there is no such evidence of Phillips curve effect for the Indian economy.

Some of the answers to the questions raised in this thesis, presented below are tentative conclusions. They need further research work to corroborate them.

(1) **Definitional problems in the Indian monetary system.**

The narrow (M1) definition of money is more important than broader (M2) definition of money from the point of view
of controlling nominal national income and especially as far as the control of inflation is concerned. This result has been arrived at by Factor Analysis and direct Friedman-Meiselman dual criteria tests. But the stability of demand for money functions results do not provide a definite conclusion regarding empirical money definition issue; however some of the results from demand for money estimations suggest that Quantity theory analysis of money is more consistent with narrow definition of money in India. And it is important to be aware of a policy point that only in the long run the income elasticity of narrowly defined money tend to unity so that the Reserve Bank of India has to plan for less nominal supply of money (M₁).

(2) Functional specification of the demand for money functions in India:

It has been found that the Generalised Functional forms which have higher log likelihood values are significantly different from the a priori chosen linear or log-linear functional forms. The transformation parameter of interest rate is different so that the usual assumption that interest rates enter the demand for money function in the same way with other variables either linearly or log-linearly with other variables may not be right.

(3) Stability of money demand relationship in each specification:
The Generalised functional forms of the money demand functions in India with income either current or permanent and long term interest rates, with partial adjustment models yield stable money demand relations for both narrow and broad definitions of money. As money demand functions are found to be stable, though with some partial adjustment mechanism, the monetary authority can depend on the nominal money stock as a target of monetary policy. The plausible explanation for the partial adjustment is the slow adjustment to price or inflationary expectation and nominal interest rates.

Fisher's hypothesis of the positive relation between nominal rate of interest and inflationary expectation has been found supported for both short term and long term interest rates, with a relaxed assumption of constant real interest rate. However as far as long term rates are concerned there is some lag in the adjustment between inflationary expectation and nominal interest rate. This lag effect may have implications for both theory and policy. The government policies regarding interest rates, though in the short run may not be sensitive to market forces, in the long run they can not ignore such forces. The variability of inflation is one of the important variables affecting real interest rate negatively, and demand for money positively.
Inflationary process, often generates the variability of inflation rate. The importance of the variability of inflation in macroeconomic models has only been recently recognized in monetary economics literature. Further research work is needed for India too, incorporating the variability of inflation into macro-econometric modelling.