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Factors Affecting Demand for Money: An Empirical Study Based on Time Series Analysis

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Abstract - *This study tries to find out factors affecting demand for money by empirical testing. Using Indian data, this study mentioned that foreign exchange reserves, government borrowing, real gross domestic product and exchange rate are among the important determinants of money demand.*

Key Words: **Demand for money, Broad money, Foreign exchange reserves, Regression, Gross domestic product.**

1. INTRODUCTION

Demand for money is an important macroeconomic component, as it is indispensable for monetary policy analysis. The availability of various monetary aggregates (like M1, M2, M3 and M4) raises concern for choosing appropriate measure. In India, money stock measures defined as:
M1 = currency (with public) + demand deposits + other deposits with Reserve Bank of India.
M2 = M1 + savings deposits with the post office savings bank.
M3 = M1 + time deposits
M4 = M3 + all deposits with the post office savings organization.
According to report of RBI third working group on money supply, M1 and M3 are the two measures among four that are extensively used for policy purposes. The introduction of M2 and M4 are more prompted to pre-1969 when post offices catered banking facilities in many places, this lost sharpness with the increased growth of banking network in rural as well as urban areas. Hence, the present paper uses M3 as a broad money aggregate.

The traditional theory of money depends on the closed economy , which represents money demand as being affected by domestic variables only, like income , government borrowings and so on. But, with the rising globalization of financial markets, it is also necessary to incorporate the open economy variables affecting demand for money.

This study is managed in the following manner. Section 2, discusses various literature available relating to demand for money and its determinants. Section 3 explains data used for analysis followed by discussing specifications of the model used and findings of the study in section 4. Section 5 provides the concluding remarks.

2. LITERATURE REVIEW

There are many studies across the globe studying money demand. Halicioglu and ugur (2005) studied stability of demand for money in developing OECD country (Turkey). It uses univariate as well as multivariate co-integration methods, along with that it also incorporate autoregressive distributed lag model (ARDL) for the same study. It considers real national income, interest rate and exchange rate as factors affecting narrow money stock.
Khalib (1999) specified money demand function for some selected Asian countries (Philippines, Singapore and South Korea). He finds that money demand function is determined by factors like domestic income, foreign income, foreign interest rate, domestic interest rate and some measures of exchange rate depreciation.
Huang *et. al* (2001) investigates factor affecting money demand by segregating real income into various expenditure components.
Valadkhani (2002) finds out long and short run determinants of money demand for New Zealand using co-integration analysis. This paper finds that the demand for money is cointegrated with real income,

the spread between interest on money and on non-money assets, the expected rate of inflation, and the real effective exchange rate. Tang (2005) examines the effects of various demand components of real income, domestic interest rate and exchange rate on money demand. He separated components of real income into final consumption goods, expenditure on investment goods and exports. Using annual data for Malaysia, the author apply bound test based on unrestricted error-correction model estimates.

3. DATA SOURCE

The present paper directs this analysis towards the study on Indian economy for that I extracted data from the various issues of "Handbook of Statistics on Indian Economy" published annually by Reserves Bank of India. The time period under consideration is 1980-2014.

4. MODEL SPECIFICATIONS AND RESULTS

Based upon the literature review, there can be many factors affecting broad money aggregates. For the present paper, I have used gross domestic product (GDP) at constant prices, foreign exchange reserves (in rupees billion), nominal effective exchange rates and government borrowings (in rupees billion) as the factors affecting broad money (M3).

All the above cases do not reject the null hypothesis of non-stationarity at levels. Therefore, none of the variable is stationary at levels. Proceeding further, I tried to find out whether these series become stationary after first differencing. Only NEER become stationary after first differencing. All the rest of variables are found to be stationary at their growth rates, i.e. first difference of their logarithmic value. Logarithmic values are calculated at their natural logarithmic.

Variable	*Test statistics*
FDLNM3	*-4.217*
FDLNFER	*-4.443*
FDLNGDP	*-4.910*
FDLNGB	*-5.899*
FDNEER	*-3.408*

Source: Author's computation using STATA

Table 1: Results of Dickey Fuller Unit Root Test

I have used Dickey fuller unit root test for the above motive. If the absolute value of test statistics for the variable is greater than its Mackinnon 5% critical value (-2.978), then the variable is stationary.

The above paragraph suggests that, we are trying to find out how the rate of growth of government borrowings, rate of growth of foreign exchange reserves, rate of growth of GDP and change in nominal exchange rate affects rate of growth of broad money demand.

$$FDLNM3 = \beta_1 FDLNFER + \beta_2 FDLNGDP + \beta_3 FDLNGB + \beta_4 FDNEER + u_t$$

Where FDLNM3 - rate of growth of broad money demand,

FDLNFER - rate of growth of foreign exchange reserves,

FDLNGDP - rate of growth of GDP

FDLNGB - rate of growth of government borrowings

FDNEER - change in nominal effective exchange rate.

I had also used consumer price index, long run interest rate, short run interest rate and difference between long and short run interest rates in trial runs. But I am not presenting it here for the sake of simplicity

Table 2: Regression results

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. reg fdlnm3 fdlnfer fdlngdp fdlngb fdneer, noconstant

      Source |       SS       df       MS              Number of obs =      34
-------------+------------------------------           F(  4,    30) =  119.50
       Model |  .77997448      4  .19499362             Prob > F      =  0.0000
    Residual |  .048954052    30  .001631802            R-squared     =  0.9409
-------------+------------------------------           Adj R-squared =  0.9331
       Total |  .828928532    34  .024380251            Root MSE      =  .0404

------------------------------------------------------------------------------
      fdlnm3 |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
-------------+----------------------------------------------------------------
      fdlnfer |   .0699173   .032888     2.13   0.042     .0027511    .1370835
      fdlngdp |   1.850237   .1362979   13.57   0.000      1.57188    2.128595
      fdlngb |   .0666542   .0286591     2.33   0.027     .0081245    .125184
      fdneer |   -.002032   .0007278    -2.79   0.009    -.0035183   -.0005456
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Source: Author's computation using STATA

The above table shows the results of multivariate time series regression. The p-values are significant for all the explanatory variables. The rate of growth of foreign exchange reserves and rate of growth of government borrowings are significant at 5% and rest of the variables are significant at 1%. The value of F statistics shows that all these variables are significant together at 1%.
According to the results depicted in table 2, 94.09% variation in rate of growth of broad money demand is being explained by explanatory variables.

FDLNM3 = 0.0699 FDLNFER + 1.850 FDLNGDP + 0.0666 FDLNGB - 0.002 FDNEER

The regression results shows that change in growth rate of real income will have positive impact on growth rate of money demand, as when there is increase in real income that will lead to increase the demand for money for buying more goods and services.

Also, increase in government borrowings can be fulfilled by printing more money, that can lead to increase in general price level , because of which a consumer have to spend more money in order to buy initial consumption bundle. Hence it will have a positive impact on demand for money.

According to available literature, change in exchange rate could have positive or negative impact on money demand. The positive impact can be explained as an increase in exchange rate (depreciation of domestic currency) may result in increase in the currency value of foreign financial assets held by domestic residents, which might increase demand for cash balances. However, negative impact of exchange rate changes can be explained as an expectation effect. Depreciation of domestic currency may induce a future expectation of additional depreciation which will result in decrease in demand for money. Our regression result corresponds with the expectation effect of exchange rate changes.

An increase in foreign exchange reserves can help an economy to protect itself from adverse effects of exchange rate change. In other words, it can help in reducing fluctuations in value of domestic currency. So, an increase in foreign exchange reserves may lead to increase in credibility of domestic currency, which can cause an increase in demand for money.

There is no problem of serial correlation as suggested Durbin- Watson d-Statistics (2.163)

5. CONCLUSION

This study targets towards finding the variable which can explain the changes in demand for money. The present paper concludes that one percentage increase in rate of growth of foreign exchange reserves, rate of growth of government borrowings and rate of growth of gross domestic product will have a positive impact on rate of growth of money demand, whereas change in nominal effective exchange rate have a negative impact on rate of growth of money demand. These results can have important policy implications.

REFERENCES

1) Arango, S. and Nadiri, M.I. (1981) 'Demand for money in open economies', Journal of Monetary Economics, Vol.7, No.1, pp.69-83.
2) Cheong Tang, Tuck. "Money demand function for Southeast Asian countries: an empirical view from expenditure components." *Journal of Economic Studies* 34, no. 6 (2007): 476-496.
3) Gujarati, D. N. (2003) Basic Econometrics 4th edition, McGraw Hill Publishing, Boston.
4) Halicioglu, F., & Ugur, M. (2005). On stability of the demand for money in a developing OECD country: the

case of Turkey. *Global Business and Economics Review*, *7*(2-3), 203-213.

5) Huang, Cliff J., Chien-Fu Jeff Lin, and Jen-Chi Cheng. "Evidence on nonlinear error correction in money demand: the case of Taiwan." *Applied Economics* 33, no. 13 (2001): 1727-1736.
6) Khalid, Ahmed M. "Modelling money demand in open economies: the case of selected Asian countries." *Applied Economics* 31, no. 9 (1999): 1129-1135.
7) Niyimbanira, Ferdinand. "Stability Of Money Demand In A Developing Economy: Empirical Evidence From South Africa." *The International Business & Economics Research Journal (Online)* 12, no. 5 (2013): 565.
8) Report of RBI's Third Working Group on Money Supply(1998)
9) Tang, Tuck Cheong. "Demand for M3 and expenditure components in Malaysia: assessment from bounds testing approach." *Applied Economics Letters* 9, no. 11 (2002): 721-725.
10) Valadkhani, Abbas. "Long-and short-run determinants of the demand for money in New Zealand: A cointegration analysis." *New Zealand Economic Papers* 36, no. 2 (2002): 235-250.