

# Money Supply Function for Bangladesh: An Empirical Analysis

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# Money Supply Function for Bangladesh: An Empirical Analysis

#### ABSTRACT

The study had empirically tested the money supply function for Bangladesh using annual time series data. Authors observed that high-powered money played a very significant role in the money supply process of Bangladesh, particularly with respect to the narrow money supply M1, thus providing some support for the monetarist model. However, beyond the monetarist view, additional variables in the light of the Keynesian and structuralist analysis, such as bank rate, external resources, and financial liberalization need to be taken into account in understanding the money supply process of the country. Other aforesaid variables were also found to exert some influence on the broad money supply in Bangladesh. However, given the poor performance of the narrow money model and the existence of multicollinearity problem in both models, the estimated results, even for the broad money model, needed to be interpreted with caution. Keywords: Money supply, Bangladesh, High Powered Money

#### **INTRODUCTION**

The economy of Bangladesh suffers from many problems from both the supply and demand sides of the real economy. The monetary sector of the country, particularly the management of money, credit, and interest rate may also have significant implications for the problems facing the real sectors of the economy. Bangladesh is one of the least developed countries in the world as it suffers from poverty, imperfection in both factor and product markets, continuous disequilibria in the economy, deficient administrative structure, inappropriate tax structure, heavy dependence on external sector, lack of capital stock, and massive unemployment. The country is not only technologically and managerially inefficient but also underdeveloped in the transport, telecommunication, and energy sectors. Huge amount of unemployment, low standard of living, low level of saving, surplus of unskilled labor, acute balance of trade deficit and low growth rates are prevailing in the economy. Besides, political instability causes serious problem for the economy. The country still doesn't have any effective governance system, which will ensure corporate governance and corporate social responsibility of the country.

Further, both the agricultural and the industrial sectors have yet to develop to their full potential. Public and private investment cannot be properly utilized. Default cultures in the monetary and banking sectors have become prominent in the economy. Monetary and fiscal policy of the country is yet to be properly coordinated and macro management of the country faces problems.

Besides, the formal and the informal money markets play important roles in Bangladesh, especially in the rural sector. Both sectors play complementary relationship without any direct or one to one relationship Government also borrows large amounts from the banking channels. Bangladesh Bank, the central bank of the country, cannot yet independently determine monetary policy. The government still plays an important role in the financial sector as a major borrower from the banking system as well as influencing monetary policy of the Bangladesh Bank. In Bangladesh, there is a very limited scope for individuals to invest in the capital market and lack of alternative opportunities for investment compelled them to invest mainly in bank deposits, post office savings, saving certificates and Government bonds.

This study has a very limited objective, i.e. to estimate empirically the money supply function for Bangladesh and then examine how supply of money can be managed better to improve the economy of Bangladesh. Understanding the money supply process is critical for a better management of the monetary sector of the country including the management of interest rate and credit flows, and in controlling inflation, unemployment, and economic growth. Timeseries annual data will be used to conduct the empirical study and regression analysis and other statistical stools will be utilized to conduct the empirical study.

#### LITERATURE REVIEW

The money supply and its prudent management and control through the monetary policy pursued by the central bank of a country can play a significant role in the managing and controlling the real sector to achieve low inflation and unemployment and high economic growth. In economics, several alternative indicators such as M1 or M2 money are used as measures money supply in a country. M1 is the narrow money supply, which includes currency outside banks plus demand deposit, and the broad money M2 includes currency outside banks plus demand deposit. Both M1 and M2 money can be significantly influences by the amount of High -Powered money, which is also known as the monetary base. This High powered money consists of currency in circulation and the bank reserves as shown in Appendix Fig 1 and serves as the base, based on which both M1 and M2 is determined through a money multiplier process.

Three factors are considered as proximate determinants of the money supply as suggested by Friedman and Schwartz (1963), which are: a) the stock of high–powered money; b) the ratio of deposit to reserve; c) the ratio of deposit to currency. Tobin (1965), however, disagrees with the monetarist approach to determine the money supply function. He argues that to express the stock of money in terms of high-powered money, the reserve- deposit ratio and the currency-deposit ratio are showing an arithmetic tautology. Kaldor (1970) criticizes the Monetarist view that the quantity of money is determined by the demand of the public and that

the central bank will be successful if it wants to change the quantity of money. The proponents of the Keynesians argue that if the central bank tries to increase aggregate demand by open market purchase, then it will not be possible because the public would not accept real cash balance more than their needs and portfolio requirements.

Osmani, Bakht and Anwaruzzaman (1986) opined that fiscal policy affects the monetary sector in a variety of ways. Heavy resources to deficit financing have contributed significantly to the expansion of money supply. They also observed that contrary to the assumption implicit in IMF stabilization program; unplanned deficit financing is not the pre-dominant factor behind the breach of overall credit ceilings to Bangladesh. They found that a "reserve crowding out" whereby the private sector has been pulling resources away from the government sector through the process of inflation – induced transfer of resources.

Ali (2001) observed that money supply had a multiflow effect, which accentuates the process. Principal determinants of the money supply are also causative factors of demand for money. As such simultaneous effect of supply of and demand for money creates equilibrium position in the monetary sector in Bangladesh. Maroney, Hassan, Basher, and Isik (2004) found that within the context of Bangladesh, monetary policy is more important than fiscal policy. As significant amount of development expenditures for Bangladesh comes from foreign aid and grants, it is also argued that this aid must be channeled to productive activities so that it contributes to economic growth.

#### **OBJECTIVES OF THE STUDY**

On the basis of aforesaid literature review, the study has been undertaken with the following limited objectives:

- (i) To determine factors which explain the variations in the supply of money;
- (ii) To evaluate the impact of High powered money and bank rate on money supply;
- (iii) To examine the impact of external resource availability on money supply;
- (iv) To analyze the impact of government budget deficits on money supply;
- (v) To analyze the impact of the number of bank branches on money supply;
- (vi) To find out whether any structural change has taken place in the economy in Bangladesh due to continuous financial reform programs especially since the nineties.
- (vii) To investigate the policy implications of the supply of money function.

#### **DATA AND METHODOLOGY**

Bangladesh became independent on 16<sup>th</sup> December of 1971. After independence her economy has to suffer due to legacy of the war. Immediately after independence, this study considers three years as transitional, hence abnormal periods. Thus the data from 1972-73 to 1974-75 considering as transitional period has been dropped. Though we wanted to study from the date of birth of Bangladesh, we ended up starting our investigation from 1975 (July).

Although macro-economic stability programs and structural adjustment processes started in the middle of eighties, but due to various repression prevailing in the economy, financial liberalization started in earnest in the 1990's. To make the study more up-to-date, we have taken the latest available data for which the study period is extended up to 2003 (June). As such study period is 1975-76 to 2002-03 totaling twenty-eight years. Time period of the study can be divided into two sub-periods as mentioned below:

a) Sub period-1: Monetary Policy under administrative control i.e. 1975-76 to 1989-90.

b) Sub period-2: Monetary Policy under reform measures i.e. 1990-91 to 2002-03.

Data in the study has been used extensively from the secondary sources i.e. published data in various issues of Economic Trends, Bangladesh Bank Bulletin, Bangladesh Arthanaitic Jarip, Bangladesh Arthanaitic Samikhaya, Statistical Year Book of Bangladesh, Annual Report of Bangladesh Bank, Statistical Pocket Book of Bangladesh, Bangladesh Bank Quarterly and Twenty one years of national accounting of Bangladesh (1972-73 to 1991-92) etc. We have also consulted published books, journals and unpublished Ph.D. dissertations and research works that are relevant to the study. Exact sources of data are mentioned where required.

To estimate the money supply equations, the ordinary least square (OLS) method is generally used. The relevant variables were converted into real terms as appropriate by deflating the appropriate nominal variables by the corresponding Consumer Price Index (CPI). We have used ordinary least square estimation procedure to find out the best-fit equation. We use two alternative definitions of the money supply i.e. narrow money ( $M_1$ ) and Broad money ( $M_2$ ) where money supply is considered as the dependent variable in relevant equations. Besides the aforesaid statistical test, we also test whether serially correlated errors are present or not. As such the study has computed Durbin Watson statistics. Wherever serially correlated errors are present, we have used first order autoregressive i.e. AR (1) to remove auto correlations.

#### **SPECIFICATION OF THE MODEL**

Based on the review of the literature, we specify real (inflation-adjusted) money supply (MSR) to depend on: real high-powered money (HR), Deposit interest rate (R), Real External resources (ERR) as measured by the sum of foreign remittances, and Foreign aid and loan, Government expenditures as % of Government Revenues (GERR) as a proxy for government

budget deficits (in this formulation, a value above 100 represents deficits and below 100 represents budget surplus, thus avoiding positive and negative values), the total number of bank branches (TNBB) to reflect the degree of access to banking facilities to the people, and a dummy variable D1 to reflect possible structural change in the money supply function due to reforms of the financial sector since 1991. The dummy variable will assume a value of zero for the years related to sub-period-1, i.e., 1975-76 to 1989-90 and a value of unity for sub-period-2, i.e. from 1990-91 to 2002-03.

MSR = (HR, R, ERR, GERR, TNBB, D1)(1)

The specific linear from corresponding to the above general equation is given below:

$$MSR = a + b HR + c R + d ERR + e GERR + f TNBB + g D1$$
(2)

Since money supply can be measured as narrow money (M1) as well as broad money M2, we rewrite equation (2) to have the following two versions, one for M1R and the other one for M2R with the same explanatory variables:

$$M1R = a + b HR + c R + d ERR + e GERR + f TNBB + g D1$$
(2a)

$$M2R = a + b HR + c R + d ERR + e GERR + f TNBB + g D1$$
(2b)

The expected signs of the coefficients are: b > 0, c > 0; d > 0; e > 0; f > 0; g > 0 (3)

The money supply process primarily depends on high-powered money, which is expected to have a positive impact on money supply (b > 0). High-powered money equals currency in circulation including Bangladesh Bank notes and government notes and coins plus statutory reserve balances with Bangladesh Bank. It is treated in the liabilities side of the Bangladesh Bank. According to the monetarist perspective, when high-powered money rises, and other things remain the same, the money supply is expected to rise. The volume of high-powered money is determined by the behavior of Bangladesh Bank, the central bank of the country. The central bank controls money supply subject to the behavior of the public and commercial banks. With respect to the second explanatory variable, the deposit interest rate (R), the money supply is expected to respond positively to higher deposit interest rates (c > 0) as it provides greater incentives for commercial banks to expand loans to the private sector and the general public may have greater incentive to hold bank deposits instead of currency. These increased deposits are likely to expand money supply through the usual money multiplier process.

Consider now the foreign exchange availability variable. Foreign currency availability plays a crucial role in the Bangladesh economy, particularly in the banking system. Fund management system of the commercial banks depends strongly on their international commitments and foreign exchange availability. These resources also add significantly to the bank deposits and hence the lending capacity of banking system. The possible impact of this factor is captured by an expected positive impact of the external resource variable (ERR) on money supply (d > 0). This is because the availability of these foreign resources will enhance the deposit and loan creation capacity of the banking system, thus expanding money supply in the process.

Following Bakht and Anwaruzzaman (1986), fiscal deficit is included as another explanatory variable in the money supply function. Due to fiscal deficit, the government needs to borrow from the banking system, which affects the monetary stock of the country. Increase of government borrowings from Bangladesh Bank will raise money supply of the country. Thus, government budget deficit can increase money supply to the extend that the central bank in particular and the banking system in general are under the control of the government and the government wants the banking system to finance the growing budget deficit. To the extent that the banking system lacks independence (as is generally the case in Bangladesh), the money supply is expected to be positively influenced by growing budget deficits as reflected by the GERR variable (e > 0).

Given that the financial system in Bangladesh is not yet well developed, some structural features may influence the money supply process. Two such variables are considered here, one is the number of bank branches and the other is a dummy variable capturing financial liberalization measures undertaken by the government. The total numbers of bank branches (TNBB) is expected to be positively related to money supply (f > 0). As more bank branches are opened up, access to banking system to the general public and businesses will rise and transaction cost of financial intermediation will decrease. This is expected to result in more bank deposits and loan creation, increasing money supply in the process. Finally, the financial liberalization dummy variable (D1) is expected to have a positive effect on the money supply process (g > 0) as the liberalized banking and financial system will have more freedom and incentives to expand banking services to businesses and the general public, leading to increased borrowing and lending, thus expanding money supply.

#### **EMPIRICAL RESULTS**

As discussed earlier and shown in Appendix Figure 1, money supply (both M1 and M2) are to be strongly determined by the amount of High-powered money (H) in the economy, later consisting of currency and bank reserves. This theoretical relationship is further explored using actual data of Bangladesh from 1975 to 2003 as depicted in Appendix Figure 2, which shows a strong positive relationship between the High-powered money (H) with the narrow money M1 in Bangladesh as shown by their common upward movement over time. Similar, but a bit weaker, relationship is also shown between H and the broad money M2. It seems then that M1 is more

strongly influenced by H than M2, which is not unexpected given that the broad money can be influenced by many more factors than the High-powered money alone.

Tables representing estimation results are given in Appendix tables 1 through 5. Table 1 gives descriptive statistics of the relevant variables. This table gives information on the mean, median, maximum, minimum, standard deviation, skewness, Kurtosis, Jarque-Bera statistics with their probability values, and the sample size. The skewness values show that there are slights positive and negative skewness in the data. Positive skewness shows up for M1R, M2R, HR, and ERR variables while negative skewness shows up for R, GERR, and TNBB variables. The Kurtosis values shows that the two variables ERR and TNBB have kurtosis values much above the normal kurtosis value of 3. The Jarque-Bera tests for normality shows that the only those two variables deviate from normal distribution as shown by the observed high Jarque-Bera values for which the null hypothesis of normal distribution is rejected, while the hypothesis of normal distribution seems to be valid for the remaining variables. These slight deviations of a few variables from normal distribution are not likely to affect the regression results.

Table 2 gives the simple product moment correlation coefficient of different variables in the model. A look at the correlation coefficients among the explanatory variables reveals that a few explanatory variables have high correlation with some other explanatory variables. For example, HR is highly correlated with ERR, GERR, and TNBB while TNBB is highly correlated with R. These observed high correlations among the explanatory variables may cause some wellknown multicollinearity problems in the estimation process, i.e. the coefficient estimates and their t-values may be suspect. As such, the empirical results from the regression analysis need to be interpreted with caution.

Table 3 (not reported to save space; but available from the authors upon request) gives the OLS regression results for the M1R dependent variable. The  $R^2$  and adjusted  $R^2$  values are quite high and the F-value also shows that the overall regression is statistically significant. However, in terms of individual variables, only the HR (High Powered money) is statistically significant, the rest of the variables were not statistically significant. Further, the Durbin-Watson statistic shows that this regression suffers from positive serial correlation problem as shown by the low Durbin-Watson value. Table 4 reports regression results for the same dependent variable M1R with adjustment for the first order serial correlation. Although the serial correlation of residuals are taken care of by this process, the resulting regression estimates reflect very poor and disappointing performance in the sense that none of the variables show any statistical significance except the auto-regressive coefficient and the High Powered money (HR) variables. The deposit rate variable (R), GERR, and D1 variables even came out with unexpected negative signs, although none of them are statistically significant. The ERR and TNBB variables came out with expected positive signs, but they were not significant either. This poor result may be partly due to high collinearity among some of the explanatory variables as discussed earlier. Thus, it appears that the H1R function is dominated by only high-powered money.

Table 5 reports the regression results for the dependent variable M2R. This equation seems to perform quite well in terms of standard statistical criterion, in spite of the possible multicollinearity problems mentioned earlier. The  $R^2$  and the adjusted  $R^2$  values are quite high, and the high F-value (F-statistics of 244.9) with the associated very low probability value indicate that the overall regression is highly significant at better than 1% significance level. The Durbin-Watson static is close to 2.0, which indicates absence of any linear first order serial correlation of the residuals (although non-linear and/or higher order serial correlation may still

exist). In this table, the variables HR, R, ERR, and D1 variables each came out with the expected positive signs and all are statistically significant at better than 5% level of significance except R and D1 which are significant at better than 10% level. Thus, it seems that High powered money, deposit interest rate, external resources, and the financial liberalization contributes positively and significantly in the expansion of the broadly defined money supply (M2R) in Bangladesh. Most dominant of course appears to be the high-powered money.

However, the other two variables, GERR and TNBB came out with the unexpected negative signs and GERR is not statistically significant. The negative but marginally significant coefficient of TNBB is somewhat surprising. The anomalies observed for these two variables may be attributed at least partially to the presence of multicollinearity among some explanatory variables. It is to be noted here that due to the multicollinearity problem, one needs to be careful with the interpretation of the coefficients of all the variables reported in this table, not only for the variables which show statistical anomaly. Having said that, given high R<sup>2</sup> and F values, and given the absence of serial correlation, one can safely argue that this simple linear model would be very helpful in forecasting the broad money variable M2R for Bangladesh, in spite of our caution in interpreting the signs, magnitudes, and statistical significance of the reported individual coefficients. As mentioned earlier, the individual coefficient needs to be interpreted with caution because of this problem.

#### **CONCLUSION AND POLICY IMPLICATIONS**

The study has empirically estimated the supply of money function for Bangladesh using time series annual data from 1975-76 to 2002-2003 and utilizing the traditional linear regression analysis. Although the model is estimated for both the narrow and broad money, the narrow

money function did not perform well, but the broad money function seems to be quite satisfactory, especially if one wants to forecast the broad money for the country. In terms of individual variables, the high-powered money seems to play a very prominent role in the money supply process, in particular, the supply of broadly defined money. In this sense, the monetarist model fits well in the money supply function for Bangladesh. Beyond this, it also appears that the deposit interest rate, external resource availability, and the post-1990 financial liberalization have had strong positive impact on the broad money supply of Bangladesh. For the narrow money supply, only high-powered money appears to have some influence.

However, the performance of the two other variables, budget deficit and the number of bank branches, came out with unexpected negative signs. These anomalies may be at least partially attributed to the presence of strong multicollinearity in the sample data and /or data problems. In spite of these problems and given the overall satisfactory performance of the broad money model, the estimated model can be used quite well to forecast at least the broad money supply of Bangladesh.

Authors thus conclude that that the high-powered money plays a very important role in the money supply process of Bangladesh, thus providing some support for the monetarist model. However, beyond the monetarist view, additional variables in such as deposit interest rate, external resources, and financial liberalization need to be taken into account in understanding the money supply process of the country as these other variables were also found to exert strong influence on the broad money supply in Bangladesh. However, given the poor performance of the narrow money model and the existence of multicollinearity problem in both models, the estimated results, even for the broad money model, need to be interpreted with caution.

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Having recognized the limitations of the estimated results, the paper however can make some policy recommendations. Firstly, it is clear that the high-powered money plays a significant role in the money supply process in Bangladesh. Since the central bank of the country has strong control of the high-powered money, it is strongly argued that Bangladesh Bank needs to have more independence in conducting monetary policy independent of politics of the country and need to pay serious attention to manage and control the High-powered money in order to have strong influence over both M1 and M2 money supply. Secondly, such central bank independence is expected to have a better monetary policy, which may be helpful to have a much better management of the interest rate and credit flows of the country. Thirdly, the above mentioned better management of the monetary sector may bring about a much better outcome in the real sector of the economy in terms of achieving lower rate of inflation and unemployment, and a higher rate of economic growth.

Further, various distortions from the financial markets should be removed. Without removing imperfection from the markets, the country cannot have the opportunity to attain sustainable economic development. As such, equal importance on monetary and fiscal policy should be given and both policies should be allowed to work in a complementary fashion. Besides, introduction of fully floating exchange rate system may create problem for the economy as monetary management system still cannot be significantly improved and distortions cannot be removed.

Bangladesh bank should work independently in order to have a prudent management and regulation of the money supply. Bangladesh Bank should also be concerned with the stability of exchange rates, which may require the Bangladesh Bank to keep a strong focus on inflation control Even when currencies are flexible, frequent exchange rate changes and sharp

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devaluations are undesirable in general. Small changes in flexible exchange rates are to be expected, but acceleration in the trend and abrupt changes may pose serious problems. Recently Taka value is depreciating against the US Dollar whereas in the global market, the value of the US Dollar is declining. Bangladesh Bank with a supervisory function has a key role to play in developing and implementing adequate prudential regulations and an effective supervision of financial institutions. Commercial banks in Bangladesh are not playing a proper and constructive role.

Before concluding, the authors would like to give some direction for further research in this important area. As mentioned above, the narrow money model did not perform well and both the narrow and broad money models suffer from multicollinearity problem. Future research may consider methods to overcome this and other statistical and econometric problems. Further research may also consider testing for non-stationary of the variables prior to estimating a regression model. If the variables were found to be non-stationary, the traditional regression analysis would not apply. In such a situation, one needs to conduct cointegration analysis to examine the existence of any long-run relationship among the variables, causalities as well as short-run dynamics of the system.

#### REFERENCES

Ali, M.M. 2001. Determinants of Supply of and Demand for Money: A case study of Bangladesh, Student Ways, Dhaka, Bangladesh.

Friedman, M. and Schwartz, A.J. 1963." A Monetary History of the United States, 1867-1960", *National Bureau of Economic Research Studies in Business Cycles*, No.12, University Press, Princeton, USA.

Kaldor, N., 1970. The Neo Monetarism, Lloyds Bank Review, No.97

Momen, A. 1992. "Money, structuralism and the International Monetary Fund: An auto regression assessment of controversy", *The Bangladesh Development Studies*, Vol. XX, No. 4.

Osmani, S.R. ,Bakht,Z. and Anwaruzzaman,C. 1986. *The Impact of Fiscal policy on the Monetary sector of Bangladesh*, Bangladesh Institute of Development Studies, Research Report no. 50.

Oyejide, T. A. 1974. "Controlling money supply in Less developed countries: The Case of Nigeria", *The Bangladesh Development Studies*, Vol. XVI, No. 3.

Maroney, Neal C., Hassan, M. Kabir, *Basher, Syed A.,Isik, Ihsan 2004,*" A Macroeconometric Model Of The Bangladesh Economy And Its Policy Implications", *The Journal of Developing Areas*, Volume 38, Number1

Parikh, A. and Starmer, C. 1988. "The relationship between the money supply and prices in Bangladesh", *The Bangladesh Development Studies*, Vol. XVI, No. 3.

# APPENDIX

# **Table 1: Descriptive Statistics of the Variables**

	M1R	M2R	HR	R	ERR	GERR	TNBB
Mean Median Maximum Minimum Std. Dev. Skewness Kurtosis	1244.62 1039.95 2404.48 576.60 545.97 0.64 2.17	4039.91 3408.76 10249.18 913.00 2582.46 0.81 2.77	1026.79 943.53 2208.62 302.02 552.99 0.56 2.34	8.51 8.00 11.30 5.50 1.87 -0.01 1.66	812.49 753.77 1736.49 385.98 277.81 1.76 6.44	111.17 102.70 178.82 7.24 42.85 -0.26 2.27	5020.28 5495.00 6278.00 1774.00 1241.57 -1.34 3.84
Jarque-Bera Probability Observations	2.76 0.25 28	3.13 0.20 28	1.97 0.37 28	2.07 0.35 28	28.46 0.00 28	0.93 0.62 28	9.29 0.01 28
Table 2: Simpl	e Correlation	n Matrix					
M1R M2R HR BR ERR GERR TNBB	M1R 1 0.97 0.95 -0.64 0.86 0.69 0.73	M2R 0.97 1 0.99 -0.61 0.88 0.76 0.77	HR 0.95 0.99 1 -0.63 0.85 0.79 0.80	R -0.64 -0.61 -0.63 1 -0.47 -0.52 -0.21	ERR 0.86 0.88 0.85 -0.47 1 0.50 0.61	GERR 0.69 0.76 0.79 -0.52 0.50 1 0.79	TNBB 0.73 0.77 0.80 -0.21 0.61 0.79 1

### Table 3: Dependent Variable: M1R

(Results not reported here to save space)

## Table 4: Dependent Variable: M1R with AR(1)

Method: Least Squares with AR(1)

Sample(adjusted): 1977 2003 Included observations: 27 after adjusting endpoints Convergence achieved after 36 iterations

Variable	Coefficient	Std. Error	t-Statistic	Prob.
С	127.3536	512.5685	0.248462	0.8064
HR	0.670696	0.309500	2.167033	0.0431
R	-80.49861	49.87907	-1.613875	0.1230
ERR	0.193978	0.281785	0.688389	0.4995
GERR	-1.050870	1.938256	-0.542173	0.5940
TNBB	0.193727	0.165712	1.169062	0.2568
D1	-102.8350	203.2913	-0.505851	0.6188
AR(1)	0.478967	0.257157	1.862548	0.0781
R-squared	0.941022	Mean dependent var		1269.371
Adjusted R-squared	0.919293	S.D. dependent var		540.1444
S.E. of regression	153.4495	Akaike info criterion		13.14581
Sum squared resid	447388.2	Schwarz criterion		13.52977
Log likelihood	-169.4685	F-statistic		43.30757
Durbin-Watson stat	2.091242	Prob(F-statistic)		0.000000
Inverted AR Roots	.48			

### Table 5: Dependent Variable: M2R

Method: Least Squares

Sample: 1976 2003 Included observations: 28

Variable	Coefficient	Std. Error	t-Statistic	Prob.			
С	-1073.212	453.1760	-2.368200	0.0275			
HR	3.792977	0.479464	7.910861	0.0000			
R	155.8817	85.53072	1.822523	0.0826			
ERR	1.877937	0.571879	3.283799	0.0035			
GERR	-2.422760	5.015611	-0.483044	0.6341			
TNBB	-0.297104	0.166500	-1.784409	0.0888			
D1	837.3419	460.6288	1.817824	0.0834			
R-squared	0.985022	Mean dependent var		4039.917			
Adjusted R-squared	0.980743	S.D. dependent var		2582.464			
S.E. of regression	358.3708	Akaike info criterion		14.81333			
Sum squared resid	2697022.	Schwarz criterion		15.14638			
Log likelihood	-200.3866	F-statistic		230.1770			
Durbin-Watson stat	1.965149	Prob(F-statistic)		0.000000			

Figure 1: High Powered Money as the Basis for Money Supply

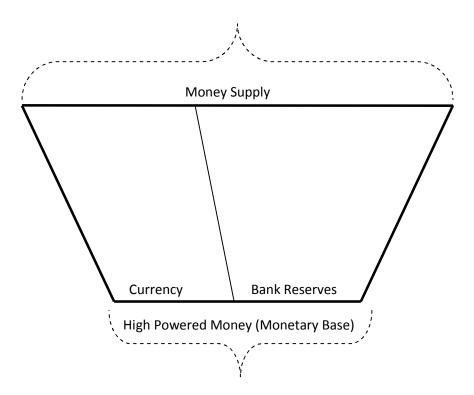


Figure 2: High Powered Money, M1 Money and M2 Money: 1975-76 to 2002-2003

