CHAPTER III

ANALYSIS OF RESERVE MONEY AND ITS SOURCES OF CHANGE

The reserve money [RM] which is also termed as the high powered money "conceptually provide base for further expansion of money supply".[1]

$$Ms = f [RM] \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [3.I]$$

Where, Ms : Money Supply

RM : Reserve Money

RM is also referred to in the literature on the subject as monetary base, primary money or government money.

Reserve money represents those liabilities of the Central Bank and the government that are deemed to be eligible as reserve to be held by banks for the purpose of deposit money creation in a system where the fractional reserve ratio governs the creation of deposit money.[2]

RM in India is the sum total of currency with the public,[3] Banker's deposits with the Reserve Bank, Cash with banks, and other deposits with RBI which are the liabilities of the Reserve Bank to the non-bank sector.

Hence

RM = Currency with the Public [c]
+ Other deposits with RBI [OD]
+ Cash with banks [CB]
+ Bankers deposits with RBI [BDR]

$$RM = C + OD + CB + BDR \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [3.II]$$

As it has been stressed earlier that the RM appears to be a proximate determinant of Money Supply in India, it is therefore imperative to analyse the behaviour of RM in detail.

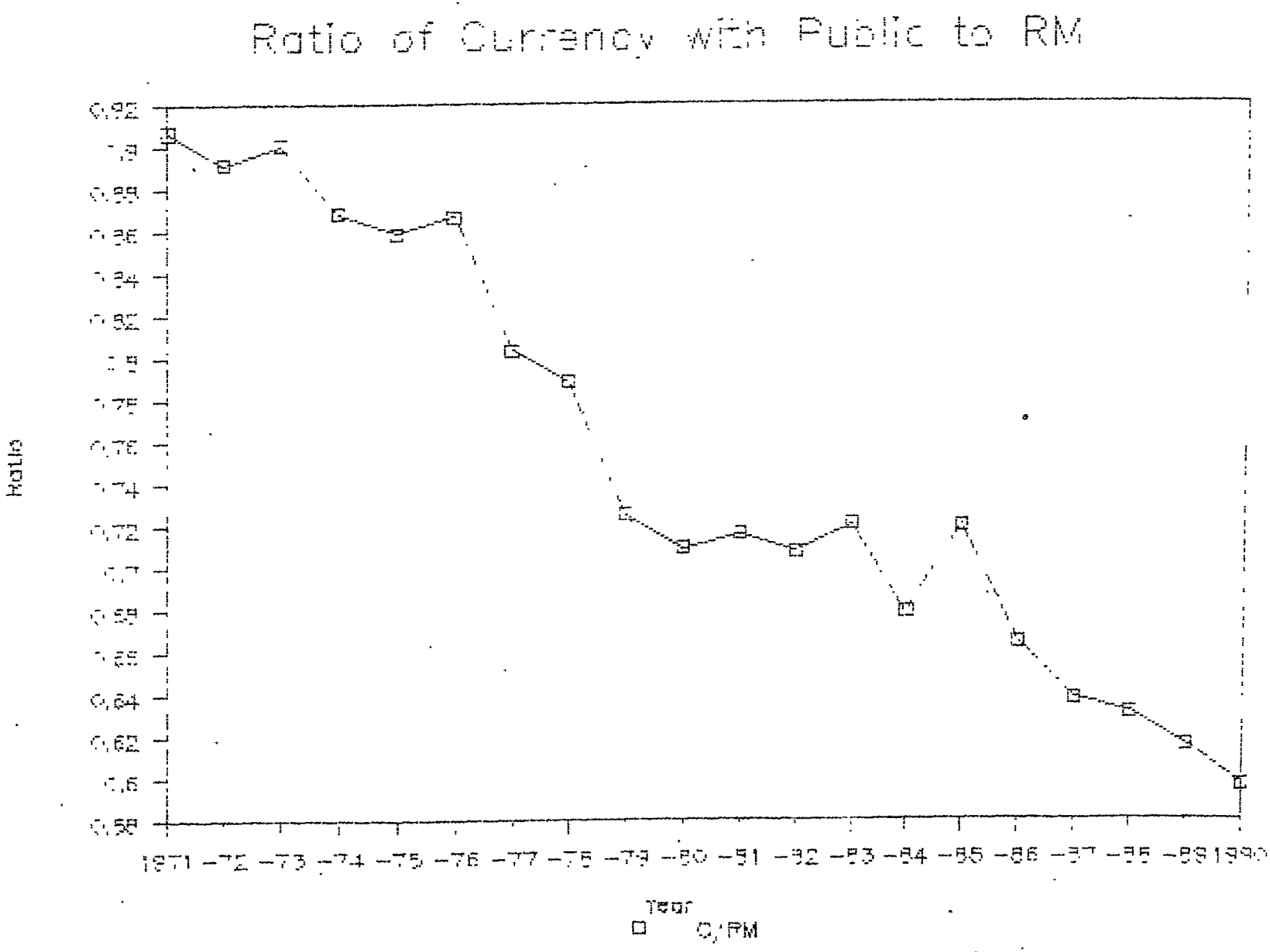
I. Reserve Money Components

Table 3.1 Reserv Money and its Components' Behaviour (relative share with respect to RM)

Year	Currency with the Public	Other Deposits With RBI	Cash with Banks	Banker's Deposit with RBI	
1970-71	Ø.907	Ø.ØØ9	Ø.Ø39	Ø.Ø45	
1971-72	Ø.892	Ø.Ø15	Ø.Ø38	Ø.Ø55	
1972-73	Ø.9Ø1	Ø.ØØ8	Ø.Ø41	Ø.Ø49	
1973-74	Ø.869	Ø.ØØ6	Ø.Ø38	Ø.Ø87	
1974-75	Ø.859	Ø.Ø11	Ø.Ø45	Ø.Ø85	
1975-76	Ø.867	Ø.ØØ7	Ø.Ø44	Ø.Ø82	
1976-77	Ø.8Ø4	Ø.Ø1Ø	Ø.Ø4Ø	Ø.142	
1977-78	Ø.789	Ø.ØØ6	Ø.Ø48	Ø.157	
1978-79	Ø.725	Ø.Ø14	Ø.Ø44	Ø.219	
1979-8Ø	Ø.71Ø	Ø.Ø25	Ø.Ø41	Ø.224	
198Ø-81	Ø.717	Ø.Ø17	Ø.Ø45	Ø.222	
1981-82	Ø.7Ø8	Ø.ØØ7	Ø.Ø43	Ø.242	
1982-83	Ø.721	Ø.ØØ8	Ø.Ø42	Ø.229	
1983-84	Ø.678	Ø.Ø11	Ø.Ø37	Ø.274	
1984-85	Ø.72Ø	Ø.Ø19	Ø.Ø38	Ø.223	
1985-86	Ø.665	Ø.ØØ7	Ø.Ø34	Ø.294	
1986-87	Ø.638	Ø.ØØ8	Ø.Ø31	Ø.324	
1987-88	Ø.631	Ø.ØØ6	Ø.Ø29	Ø.334	
1988-89	Ø.616	Ø.ØØ6	Ø.Ø29	Ø.348	
1989-9Ø	Ø.597	Ø.ØØ8	Ø.Ø26	Ø.37Ø	
Annual Trend Growth Rate During 197Ø-71 to 1989-9Ø (per centage)	12.34Ø	13.41Ø	12.59Ø	25.61Ø	RM 14.58Ø

Based on Annexure -2.

Graph - 3.1


Ratio of Currency with Public to RM
Ratio
0.92
0.88
0.84
0.8
0.76
0.72
0.68
0.64
0.6
0.56
1971 -72 -73 -74 -75 -76 -77 -78 -79 -80 -81 -82 -83 -84 -85 -86 -87 -88 1990
Year
C/PM

A detailed analysis of RM's components [Table - 3.1] clearly reveals that there are certain noticeable changes in their behaviour. Currency with the public constitutes the major share in RM. Though it has risen continously at a relatively high rate [12.34% per annum on trend basis] but, as the rate of increase in currency [12.34%] was slower than the rate of increase in RM [14.58%], the relative share of currency in the total RM has declined year after year [See Graph]. Currency with the public used to constitute 90.71% of the total RM in the year 1970-71, which has come down to only 59.67% of the total RM in 1989-90. This infact is a healthy sign for money/financial market development and particularly for banking development.

Other deposits with RBI constitutes less than 1% of total RM. Its effect is stable and more over its relative share in RM is so low that for practical purposes we can even ignore it.

The cash with banks also occupies a lower ranking. During the period of our study it has remained less than 5% of the total RM. Despite the fact that it has grown at the rate of 12.59% per annum on trend basis, it needs some attention due to its irregular behaviour. During 1970-71 to 1972-73 it was around 4% which latter on became more than 4% and remained slightly higher than 4% between 1974-75 to 1982-83. There after, it has fallen continuously. After 1986-87, its share has remained less than 3%. A fall in cash holding of commercial banks is a healthy sign, in the sense that, they do not keep large part

of their assets in the form of idle cash. Lesser idle cash with commercial banks enable them to go for more loans and advances, thus providing them an opportunity to earn more returns.

The bank deposits with the RBI is another major component of RM. Owing to statutory requirement, such cash reserves have grown with the RBI, which appear on the liability side of the RBI's balance sheet. Annexure - 2 reveals that from 1970-71 to 1989-90, bank deposits with RBI have increased by 132 folds, where as, RM has shown an increase of 16 folds only. Looking at the annual trend growth rate, we find that the growth rate of bank deposits with RBI [25.6%] is higher than the growth rate of RM [14.58%].

During seventies, the Indian economy experienced serious inflationary pressure, which can be attributed largely to enormous credit expansion by the commercial banks. The monetary authority, with a veiw to reduce the presure of inflation, has resorted to frequent changes in the cash reserve ratio [CRR].[5] During 1970-71 to 1975-76, it was between 3 to 5 percent of total demand and time liabilities of commerical banks. From 1976 to 1980, it remained at 6 percent. Since July 1981 on wards, it has been raised from time to time, so by 1984, the CRR went up to 9%. It was further raised to 10 and then 11 per cent in 1987 and 1988 and finally touched 15% level by 1990. This has resulted in higher share of bank deposits with RBI [BDR], in the total RM. The relative share of bank deposits in total RM which was 4.5% in 1970-71 went up to 36.99% in 1989-90.

The rapid growth in the bank deposits with the RBI has resulted into sizeable variation in its share in total RM during the period of our study. Bank deposits with the RBI has remained less than 10% of the total RM upto 1975-76. In 1976-77, it jumped from 8.5% to 14% and remained at 15.7% in 1978-79. Once again, it rose to 21.8% of the total RM in 1979. Then it showed a relative stability round 22% from 1979 to 1985. But, from 1985-86 onward, the relative share has risen continiously ranging from 29.4% in 1986 to 36.9% in the year 1990. Which means that of the total reserve money, more than 1/3 of it was with the RBI in the form of bank deposits.

An increase in the bank deposits with RBI will compell the banks to go for less credit creation, provided they are not being able to attract more deposits from the public. The relative change in reserve money composition clearly reveals that our banks are efficient enough to attract the public's money in the form of deposits, which is also supported by a fall in currency ratio [Table - 3.1]. It appears that the Central banking restrictions on banks have not been effective, perhaps due to the efficient mobilisation of public deposits by the commerical banks, enabling them to maintain high volume of credit.

Looking at the present state of our economy, it is highly essential for the monetary authority to have a fair control over money supply in order to check the rate of inflation and to promote better resource allocation. The authority may

check the volume of total money by altering the composition of RM or by controlling the RM itself. The above analysis reveals that the composition of RM has changed more favourably to deposit money creation. Hence, the way out for the monetary authority to control monetary expansion is preferably by controlling the growth of RM.

II. Sources of RM :

To control RM, it is essential to know the various sources, of RM or the factors which bring about change in its stock. The sources are [i] Reserve Bank's credit to Government, Banks and Commercial Sector [ii] Government currency liability [iii] Net foreign exchange reserves of RBI and [iv] Net non-monetary liability of RBI. Of these, first three are positively related while the fourth is negatively related with RM.

Hence,

RM = + Net Reserve Bank credit to Government [RBCG]

+ Net RBI credit to banks [RBCB]

+ Net RBI credit to Commercial sector [RBCC]

+ Goevrnment Currency Liability [GCL]

+ Net foreign exchange reserves of RBI [RBCF]

- Net non monetary liability of RBI [RBNNML]

$$RM = RBCG + RBCB + BRCC + GCL + RB - RBNNML \quad \ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots [3.III]$$

Table 3.2 Relative Changes in the Sources of Reserve Money (Relative share with RM)

Out standing as on the last Friday of March	Reserve Banks Claim on			Net foreign exchange assets of RBI	Govt. currency liability to the public	Net Non-monetary liability of RBI
	Goverment (Net)	Commercial & co-operative Banks	*Commercial sectors			
1970-71	Ø.791	Ø.14Ø	Ø.Ø26	Ø.112	Ø.Ø8Ø	Ø.148
1974-75	Ø.889	Ø.124	Ø.Ø88	Ø.Ø53	Ø.Ø72	Ø.226
1979-8Ø	Ø.7Ø1	Ø.Ø75	Ø.Ø94	Ø.334	Ø.Ø36	Ø.239
1984-85	Ø.946	Ø.Ø89	Ø.Ø88	Ø.Ø97	Ø.Ø25	Ø.244
1989-9Ø	Ø.95Ø	Ø.Ø59	Ø.Ø82	Ø.Ø78	Ø.Ø2Ø	Ø.226
Annual Trend Growth Rate During 197Ø-71 to 1989-9Ø (per centage)	15.71	12.3	17.36	12.45	6.62	15.67

Based on Annexure - 3.
* Inclusive of credit to NABARD (1983 onwards).

During the period [197Ø-71 to 1989-9Ø], we find that all the sources have shown relatively high growth rates. Amongst them, the growth in government currency liability was relatively low. It was 6.62% per annum on trend basis. While other sources have shown more than double digit growth rates. Though, a high growth in net non monetary liability [NNML] of RBI is a healthy

sign, as it reduces the burden of the RBI to generate additional RM. Unfortunately, the relative growth rate of NNML was not high enough to off-set the growth of other sources of RM creation. Its relative share in total RM was also not high enough so that it could restrict the excess growth of RM, caused by the RBI's transactions with the rest of the economy.

Between 1970-71 to 1989-90, the relative share of government currency liability has declined from 7.97% to just 2.00% of total RM which has certainly helped to restrict the further expansion of RM

The net foreign exchange reserves RBCF of the RBI had grown at a rapid rate , but its rate of growth was slower than that of RM. Note that the behaviour of net foreign exchange reserve was very uncertain with its yearly variations being quiet high, which certainly was not a healthy sign.

Reserve Bank credit to Government, commercial and co-operative banks and commercial sector taken together shows tremendous influence over RM. In fact the total credit to these sectors consitute more than 100% of the RM in most of the years [Annexure-3]. The total RBI credit to these sectors was 95.69% of the RM in the year 1970-71 and it went up to 112.76% in the year 1989-90. Of the total credit provided by the RBI, its credit to government needs more attention. On one side it consitutes more that 90% of the total RM during most of the period [at times

it even crossed 100% mark too] [Annexure - 3] on the other side, the average growth rate is higher than the growth rate in RM. Estimated growth was 15.71 in case of the RBI credit to Government where as it was 14.58 in case of RM during 1970-71 to 1989-90.

The RBI credit to Commerical and Co-operative banks and to Commerical sector has grown at a steady pace. The relative share of RBI credit to Banks and Commerical sectors in total RM has remained around 16 to 17% throughout the period barring the years 1975, 1976 and 1977. During these years it went up to 21.18%, 25.59% and 23.48% respectively.

The above analysis reveals that the government's share in the total sectoral credit of the RBI has gone up substantially, which appears to be the major source of change in RM. In the subsequent section we have made an attempt to analyse the impact of government fiscal operations on reserve money creation.

III. Reserve Bank Credit to Government and RM :

RBI's net claim on government accounts for the largest share in total RM. It was 79.08% in the year 1970-71 and went up and crossed the 100% [100.02%] mark in the year 1985-86. It was less than 100% [94.96%] in the year 1989-90. A close investigation in the sources of change in RM for most of the years during the period 1970-71 to 1989-90 [except for few years], reveals that more than 90% variation in RM was caused by RBI's net claims on government, expressed in absolute terms [Table 3.3]

Table 3.3 Trend in Net RBI Credit to Government

Year	Net RBI Credit to Government (Rs. Crore)	% of RM
1970-71	3807	79.08
1971-72	4689	87.16
1972-73	5489	91.26
1973-74	6234	85.87
1974-75	6570	88.94
1975-76	6697	86.61
1976-77	7762	79.22
1977-78	7644	69.86
1978-79	9416	66.86
1979-80	11534	70.05
1980-81	15232	81.07
1981-82	19667	96.11
1982-83	22314	96.56
1983-84	26625	92.37
1984-85	29774	94.59
1985-86	38901	102.76
1986-87	45768	102.13
1987-88	52793	99.06
1988-89	60018	96.22
1989-90	73683	94.96

Based on Annexure- 3.

We have tried to investigate the resposiveness of RM with respect to RBCG, for the period of our study, i.e. [1970-71 to 1989-90].

$$RM = f\ [RBCG] \quad \ldots \quad \ldots \quad \ldots \quad \ldots \quad [3.IV.]$$

We have estimated the above function in the double log form.

$$\log RM = \underset{\text{t-value}}{0.942} + \underset{\text{t-value*}}{0.916} \log RBCG$$

$$R^2 = 0.968 \qquad DW = 0.49$$

It is clear from the above estimated equation that the elasticity of RM with respect of RBCG is Ø.916, indicating very high degree of responsiveness.

Further we have also tried to examine the responsiveness of change in RM [Δ RM] with respect to change in RBCG [Δ RBCG] which is Ø.917 as presented below :

Δ RM = f [Δ RBCG] ... . [3.V]

The estimated equation is (Excluding the year 1977-78, as it has -ve RBCG].

$$\log \Delta RM = \underset{(Ø.78)\ t\text{-value}}{Ø.641} + \underset{(8.76)\ t\text{-value}}{Ø.917} \log \Delta RBCG$$

R^2 = Ø.828 DW = 2.Ø1

Both the elasticities are quite similar and high.

It is important to note here that in India we do not have an active market for bills either commerical or treasury. The open market operations are conducted exclusively in dated securities.[3]

Open market operations of the Reserve Bank have become more or less unidimensional in character, with constant concern of government and the bank to sell more and more government securities for minimising the gap in budgetary operations which has to be financed as the last resort by borrowing from the Reserve Bank of Inida. As a result, open market operations are essentially a debt holding operations to the government of India.

Reserve Bank's experience with the open market operations - which primarily aim at controlling the reserve base of the banking system and endeavours to provide seasonal or other type of finance for Commerical banks - may be of great significance to keep developmental process on an even keel. In the Indian case, though these operations have been broadly consistent with the general monetary policy of controlled expansion undertaken by the Reserve Bank of India, they have primarily been utilized to assist the debt - management and government borrowing and, therefore, should be viewed more as fiscal weapon than as instrument of monetary policy.

In the analysis of reserve money, consisting of the Reserve Bank assets capable of generating "high-powered money" [currency plus deposits with the RBI], it is necessary to examine the impact of government fiscal policy operations on the monetary base i.e. RM.

Fiscal policy may well entail government expenditure in excess of tax-revenue receipts. This implies a deficit in the budget. In fact, year after year, budgetary gap has increased owing to enormous growth of government expenditure in relation to tax revenue of the government. Owing to this persistent disequilibrium between government expenditure and revenue income the government was forced to use various other sources to raise finance.

Taxation, public borrowing, external sources and contributions from public enterprises have been the conventional items on the receipt side. The excess of expenditure over revenue income is covered in the annual budgets by additional taxation and borrowing. The Reserve Bank credit policy plays an important role in meeting the uncovered "budgatary gap" which remains even after additional taxation.

Essentially, therefore, the above discussion makes us to believe that there is a close proximity between the budgetary deficit [BD] and the Reserve Bank Credit to government.[6]

Hence, we have -

RBCG = f [BD] ....[3.V]

IV Budgetary Deficit [BD][7] and RM :

The deficit finance has become an integral part of India's budgetary exercise. For the last two decades, RM and BD have shown close proximity. Money supply being closely related to RM, we infer it to change positively with BD.

During 1971-72 to 1989-90 not only we had huge deficit in our budget but the extent of deficit went on increasing year after year. The trend growth rate in BD was 18.28 per cent per annum during this period. Looking into the annual changes in the BD, RM and Net RBI credit to government, we find that over years, the entire budget deficit of the government has been financed by the RBI, which has resulted into automatic monetisation of the deficit.

Table 3.4 Budgetary Deficit, RBI Credit to Government and RM Variation (Rs. Crore)

Years	Budegatory Deficit *	Change in Net RBI Credit to Government	Change in RM
1971-72	808	882	566
1972-73	876	800	635
1973-74	554	745	1245
1974-75	752	336	127
1975-76	291	127	345
1976-77	81	1065	2066
1977-78	1162	-118	1143
1978-79	496	1772	3142
1979-80	2620	2118	2382
1980-81	3474	3698	2323
1981-82	2412	4435	1675
1982-83	2476	2647	2647
1983-84	1968	4311	5714
1984-85	5183	3149	2653
1985-86	3249	9127	6381
1986-87	9151	6867	6955
1987-88	5582	7025	8483
1988-89	5478	7225	9081
1989-90	12947	13665	15214

Based on Annexure - 3 & 5.
* As through out the period there was deficit only so we have ignored the sign.

The budgetory deficit of the government is financed by borrowing through the issue of Treasury Bills [TB] and/or drawing down the cash balance with the RBI. The ownership pattern of Treasury Bills reveals that over 90% of the TBs are held by the RBI. This is due to the fact that the other purchasers of TB

[Banks, State Governments and individuals] do not hold them till their maturity, instead, they get it rediscounted with the RBI before maturity. This resulting into heavy accumulation of such claims on Government with the RBI.

Table - 3.4 explains that in the year 1971-72, the BD was Rs.808 crores against which RBI's net credit to government was Rs.882 crores, which finally resulted in an increase in RM by 565 crores. [ΔRBCG > ΔBD > ΔRM]. The comparative picture for the year 1980-81 is similar , Rs.3474 crores BD leading to Rs.3698 crores net Government borrowing from RBI, bringing about Rs.2332 crores increase in RM. By the year 1989-90, the observed relationship among BD, RBCG and RM has shown a remarkable shift. A budgetary deficit of Rs.12947 crores made government to borrow Rs. 13665 crores from the RBI which in turn resulted into a net increase in RM by Rs.15214 crores [ΔRM > ΔRBIG > ΔBD].

The above analysis reveals that during the period 1980-81 to 1989-90 as compare to earlier period i.e. 1970-71 to 1979-80, the variation in RM was higher than the variation in RBI credit to government.

This provides strong support to our contention that a large part of the variation in RM has been caused by the government's net borrowing from the RBI in order to meet its mounting deficit requirements.

The above findings can also be substantiated with the help of following exercise :

$$RM = f[RBCG] \quad \ldots \quad [3.IV]$$

$$\Delta RM = f[\Delta RBCG] \quad \ldots \quad [3.V]$$

$$\Delta RBCG = f[BD] \quad \ldots \quad [3.VI]$$

$$\text{Hence, } \Delta RM = f[BD] \quad \ldots \quad [3.VII]$$

The relationship between BD and RM on annual change basis has revealed that unitary change in BD leads to 1.Ø2 units change in RM. Shown by the following equation :

$$\Delta RM = \underset{(1.Ø3)\ t\text{-value}}{646.1Ø} + \underset{(7.31)\ t\text{-value}}{1.Ø2}\ BD$$

$$R^2 = Ø.76 \qquad DW = 2.6$$

The estimated outcome in the double log form, which shows the elasticity of RM with respect to BD, is as follows :

$$\text{Log } RM = \underset{(2.29)\ t\text{-value}}{3.Ø5} + \underset{(3.53)\ t\text{-value}}{.623}\ \log BD$$

$$R^2 = Ø.42 \qquad DW = 1.95$$

The elasticity of RM with respect to BD [.623] is significantly high which reveals that BD brings about a substantial change in RM vis-a-vis RBCG.

NOTES :

Ø1. RBI : Annual Report 1978-79

Ø2. RBI : Report of the Committee to Review the Working of the Monetary System, 1985, P.99

Ø3. Currency with the public are liabilities of the Reserve Bank. It should be noted that a part of currency with the public consists of rupee coins [and notes] and small coins which are the currency liabilities of the Government of India.

Ø4. Excluding balances in account No.1 of the international monetary fund, the Reserve bank of India Employees Pension, Provident and Guarantee funds and adhoc liabilities items which arise from time to time.

Ø5 Under the provision of the reserve Bank of India act, the scheduled Commercial banks were required to maintain with the RB every week a minimum average daily cash reserve equivalent to 3 per cent of their demand and time liabilities [DTL] in India outstanding as on the Friday of the previous with the enforcement of relevent amendments to the Act since March 29, 1985 their average balances are to be maintained over each fortnight. The RB is empowered to vary the CRR between 3 percent and 15 percent. Under the provision of Banking Regulation Act, the cash reserve ratio applicable to co-operative banks and non scheduled banks is 3 percent and this ratio is not being varied by the RBI.

Ø6. Similar Views are expressed by many emperical studies in India :

[i] D.S. Pathak - Working of the Monetary System in India, M.S. University, 1979.

[ii] Other studies highlitied in the Review of literature.

Ø7. Budgetary deficit or surplus is measured [A] in the case of Central Government by [i] net increase/decrease in outstanding treasury bills and [ii] withdrawls from/addition to cash balances and [B] in the case of states by the state budget figures of [i] net increase/decrease in the RBI credit in the form of ways and means advances [repayable in 9Ø days] and over drafts [payable with in 7 days] [ii] decline/increase to cash balances and [iii] net sales/purchase of securities held by state in their Cash Balance Investment Account.

* The analysis in our study shows that the individual behavioural equation satisfy most criteria of goodness of fit. The sign of the estimated parameters are in accordance with the priori theoretical expectations [which is true almost in all cases].

DV-3