SPEECH

MONETARY POLICY REVISITED*

C. Rangarajan

It is a great honour to have been asked to deliver the Dr.Lakdawala Memorial Lecture. Dr.Lakdawala was a father figure for generations of young economists. As a teacher, scholar and researcher, he was the moving spirit behind the Indian economic profession for well over three decades. To the budding economists, he was a source of great inspiration and almost a role model. Professor Lakdawala left his imprint on many branches of economics and perhaps, more particularly, in the areas of public finance and international trade. All his writings were models of clarity. He developed his ideas systematically making it easy for any reader to absorb them. Dr.Lakdawala was interested in theory and he was equally interested in empirical analysis. All his writings reflect this bias.At the personal level, he was gentle and sympathetic. His humility was to be seen to be believed. Such persons are indeed rare. May his memory inspire all of us to do our best.

2. In 1988, when I delivered the Presidential Address, I chose as my theme: 'Issues in Monetary Management'. It is to this theme that I would like to return today. I would like to explore briefly, whether the propositions made at that time are still relevant and whether some of the assumptions need to be revised in the context of the changed and changing circumstances.

3. Professor Sukhamoy Chakravarty had once quoted Sir Dennis Robertson, who had compared the role of monetary system in the overall functioning of the economy, to the function of the liver in the body metabolism. The presence of liver is felt only when it begins to malfunction. Otherwise, it is ignored. Looking at the spate of discussions on monetary policy across the world, it must be presumed that the 'liver' of monetary system has not been functioning very well in many countries.

4. Let me go back to my earlier address. There were four major propositions I emphasised:

One – Apart from the promotional role which a Central Bank is expected to perform, a major objective of monetary policy is to ensure a reasonable degree of price stability.

Two – In order to achieve price stability, control over money supply is necessary and there are reasons to presume that the demand function for money in India is a reasonably stable function of certain variables.

Three – To achieve control over money supply in the Indian system, there has to be a close understanding between Government and the Reserve Bank, since a major part of the reserve money creation arises as a consequence of net RBI credit to Government.

Four – There is need for rationalising the structure of administered interest rates, which over the years has become extremely complex. While it is possible to build into the interest rate structure some element of cross-subsidisation, the structure of administered interest rates should not deviate too far from market expectations if funds are to stay within the organised financial system.

Objective of Monetary Policy

5. The importance of price stability as an objective of monetary policy, is gaining ground the world over. In fact, in the industrially advanced countries it is increasingly becoming an article of faith. The objective of price stability, however, needs to be interpreted carefully. In

*Dr D.T. Lakdawala Memorial Lecture delivered by Dr C. Rangarajan, Governor at the Platinum Jubilee Conference of the Indian Economic Association on February 20, 1994 at Bombay.

some ways it is not an end in itself. It is a means to achieving growth. Except in very short periods, there cannot really be a conflict between price stability and growth as objectives. Price stability as an objective has also a social justice dimension. In a society in which a very large segment of population has no hedge against inflation, inflation hurts the poor the most. As it was once remarked 'there can be no better anti-poverty programme than inflation control'. In the context of the closer integration with the world economy, there is need to ensure that the domestic price level does not rise disproportionately to prices in other countries. The importance of price stability as an objective, cannot, therefore, be overstated.

Money and Prices

6. In relation to the conduct of monetary policy, a critical issue is the relationship between money supply and prices. It is not the contention of anyone – certainly not mine – that price increases are solely explained by increases in money supply. Undoubtedly, supply shocks do have an important bearing on prices. It is, however, true that when money supply is excessive in relation to changes in output, it spills over into increase in prices. Hence, the need to moderate money supply growth consistent with the changes in output.

7. In this context some technical issues arise. One issue relates to the existence of a reasonably stable demand function for money. Its absence makes the conduct of monetary policy difficult. Perhaps, no single econometric function has been annotated and analysed in as much depth as the demand function for money. With far reaching changes in the financial system and proliferation of money substitutes, the shift in the money demand equation has been a subject of intense study in the industrially advanced countries. In the more recent period, the breaking down of the national barriers with respect to the movement of funds has also raised questions about the estimation of the demand function for money. Experimentations in the estimation of demand function for money have been in three directions. Earlier, demand for real money balances was related to income or wealth variables and rates of interest. The current trend is to estimate demand function, taking into account the influence of financial innovations, expectations and regulatory changes in the monetary system. The second area of experimentation is in incorporating different types of lag structures in the estimation techniques. And third, estimation is attempted based on the concept of short-run disequilibrium and long-run co-integration. In these models, the observable short-run demand function for money is continually fluctuating around its long-run unattainable equilibrium path. The interest of economists and econometricians in the estimation of demand function for money remains unabated and professional journals continue to carry new studies in this area.

8. Many of the factors which have been attributed to the shift in the demand function for money have so far played only a marginal role in the Indian context. In fact, many estimates do show money balances as a stable function of a small set of significant variables. Inverting the demand function for money, price equations have been estimated relating prices to real income and nominal money.

9. Critics who are sceptical of the relationship between prices and money point to the fact that there are many years in which there are wide divergences between changes in prices on the one hand and changes in income and nominal money supply on the other. This is attributed to a failure of money supply to explain changes in prices. I am afraid, this is not a correct approach. I have maintained repeatedly that the relationship between prices and income and money supply is found to hold reasonably well over a period of time. Averages of price change over a period of four to five years are predicted with reasonable accuracy by these equations and these predictions fall within a range which should be a sufficient guide to policy. In my Presidential Address, I had shown that five-year moving

averages of actual and estimated price changes derived from a price equation correspond closely. Upon extending the earlier equation to include more recent observations, I find that the proposition still holds good (see Appendix).

10. Yet another criticism of the use of demand function for money for purposes of inflation control has been that such models do not take into account the impact of money on output. It is true that the process of money creation is a process of credit creation. Money is created because credit is given to one sector or the other. Since credit facilitates production process, it must have a favourable impact on output. There is no dispute on this line of argument. Some years ago, I had estimated a macro-economic model in which output effects of credit were captured along with the demand effects of the increase in money supply. In fact, there are very few models which have attempted to bring in both the monetary impact and the credit impact. However, I found that the price effect of a given expansion in money supply is higher than the output effect.

Fiscal and Monetary Policy

11. The major part of my earlier lecture had been devoted to the link between fiscal and monetary policy. It emphasised the need for close co-ordination between the two for effective functioning of monetary policy. The present system of financing the resource gap of the Central Government results more or less in the automatic monetisation of the deficit. It was against this background that the Chakravarty Committee had recommended a system of monetary targeting, mutually agreed upon between the Government and the Reserve Bank. This would help to set a mutually agreed limit on the net RBI credit to Government. The Committee felt that the limit itself will be derived from the desired level of money supply growth. The monetary target was to be expressed in terms of a range and the target could be changed based upon the developments in the real sector.

12. In the past few years several significant changes have occurred in relation to Government finance. The Central Government has committed itself to reducing the fiscal deficit and has done so to a certain extent. In the eighties, as a consequence of rapidly rising fiscal and budgetary deficits, the cash reserve ratio and the statutory liquidity ratio were continuously increased to offset the expansionary effect of deficits. This reached its historical peak level in 1991. With the reduction in the fiscal deficit, it has now been possible to reduce CRR and SLR. The rate of interest on Government paper has also become increasingly attractive. In the current year, despite SLR reduction, commercial banks are voluntarily holding Government securities far above the stipulated ratio, thus reducing the monetisation of the deficit which would otherwise have occurred. As the fiscal and budget deficits come down further as a proportion of GDP, RBI will come into its own. Regulation of money and credit will get determined by the overall perception of the central monetary authority.

Rate of Interest

13. A central feature of the Indian monetary system is the structure of administered interest rates. The administered structure originated due to the felt-need to provide credit to certain sectors of the economy at concessional rates of interest. The regulation of lending rates in turn required the regulation of the deposit rate. While over the years, the system became extremely complex, some major reforms have been carried out in recent years. The number of concessional slabs of lending rates has been reduced. At present, apart from a maximum deposit rate, there are only three prescribed lending rates: a lending rate for borrowings upto Rs.25,000; another rate for borrowings between Rs.25,000 and Rs.2 lakh and above, and, a minimum lending rate which is same as the rate for the slab between Rs.25,000 and Rs.2 lakh. The Government has been able to raise funds from the market through the auction mechanism at rates which are market-determined.

14. There is considerable controversy as to whether the rate of interest is an important variable in determining the overall savings. While, income may be the most dominant variable in the determination of savings, there is little doubt that the transferable savings, i.e. savings in the form of financial assets by households are influenced by interest rates. Banks and other financial institutions, if they are to attract deposits, have, therefore, to offer rates of interest which are attractive enough for the savers. Even within the organised financial system, banks have to compete with other institutions to attract funds. These factors thus have to be kept in mind, even if interest rates are to be administered.

15. In this context, the need for certain concessional rates has been recognised. The objective of policy over time however, should be to reduce the number of interest rates prescribed by the Reserve Bank. Nevertheless, interest rate is a variable which is significantly influenced by the actions of the Central Bank. As part of monetary policy, the monetary authority should decide when the rates of interest should go up and when they should come down. Perhaps, we should move towards a situation in which one of the rates of the Reserve Bank emerges as a reference rate in relation to which other rates in the market are determined.

Effectiveness of Credit

16. Banks and financial institutions are purveyors of credit. As mentioned earlier, credit is a critical input in the production process. The output effect of expansion in money and credit, therefore, depends upon how effectively the credit granted is utilised. The ongoing financial sector reforms, in fact, lay emphasis on this. The prescription of prudential norms relating to income recognition, provisioning and capital adequacy are intended to ensure that banks operate efficiently and credit risks are properly assessed. We have reiterated that the allocation of credit for the priority sectors would be maintained. There is no conflict between social banking and good banking, so long as adequate care is taken to ensure that credit provided is based on proper assessment. Monitoring the end use of credit by an outside agency is always difficult. It is for the banks to ensure that the credit they provide is utilised for the purpose for which it has been granted and that there is effective monitoring of the manner in which the credit is utilised.

Instruments of Credit Control

17. The recent changes have also a bearing on the instruments of credit control. As mentioned previously, the major instrument of credit control in the Indian context has been CRR, which in the eighties, was increased almost from year to year. The SLR though not recognised as an instrument of credit control did play that part in the Indian context, because of its impact on what the Reserve Bank would have provided as credit to Government in its absence. With the recent changes in the interest rate structure, more particularly in relation to the Government paper, we are moving to a situation in which indirect instruments of credit control such as open market operations can be effectively used. A beginning has already been made and as a consequence in the current year net RBI credit to Government will be lower than the budgetary deficit. The effective use of open market operations will rest not only on the interest rate on Government paper but also on the development of appropriate institutions in the secondary market.

18. Another important change in the operation of monetary policy will be the closer co-ordination between monetary policy and exchange rate policy. The stability of the exchange rate in a market – determined environment depends crucially upon the degree of success that it achieves in holding down the inflationary pressures. While it is still possible to maintain a domestic interest rate structure different from the structure that is prevalent

elsewhere, pressures arising from such a dichotomy will have to be increasingly taken note of.

19. Monetary policy in its broadest sense, of course, goes beyond regulation of money and credit and interest rates. Development of appropriate financial institutions to suit the growing needs of the economy will always have to be an important task of monetary authority; particularly in a developing economy like ours. While some institutions will come into existence as a result of competitive forces themselves, there may be areas to which special attention will have to be paid by the central monetary authority. I would in this context refer to the need for rejuvenating the rural credit delivery system in the country. We intend paying adequate attention to this during the coming year.

20. Someone once remarked "central banking is neither a science nor an art but a craft". This is at best a half truth. Central banking is no longer a case of applying well known remedies to well known problems. Often times, it is difficult to identify what the problems are and even if the problems are known, the remedies are not always clear. The task of a central banker is therefore difficult. Too much money and credit through price increase can cause distortion in the economy just as too little can hinder the smooth functioning of the system. The skill of the Central Bank lies in achieving the appropriate balance.

Appendix

Money Output and Prices in the Indian Economy*

The relationship between money and real output can be depicted in the form of a simple real money demand function on the assumption that the elasticity of price with respect to money is unity :

$$(M_t / P_t)_D = a.Y_{R_t}^{b} \quad \ldots (1)$$

Where M, P and Y_R denote the nominal money, the level of prices and real income, respectively; a is a constant and b is the income elasticity of demand for money. The equation states that the quantity of real balance demanded, $(M_t / P_t)_D$, is a function of real income.

Equation (1) is linear in logarithms; Hence,

$$\text{Log } M_t - \text{Log } P_t = \text{Log } a + b \text{ Log } Y_{Rt} \quad \ldots (2)$$

Equation (2) can be rearranged to obtain a price equation of the form :

$$\text{Log } P_t = \text{Log } M_t - b \text{ Log } Y_{Rt} + C \quad \ldots (3)$$

Where, b is the elasticity of price with respect to income and also the income elasticity of demand for money assuming an unitary elasticity of price with respect to money.

2. Equation (3) assumes that the adjustment of prices to their equilibrium level occurs within the time period used in the empirical exercise. To allow for lags in the adjustment process, this price equation has been estimated following a partial adjustment mechanism for the period 1970-71 to 1992-93 in a double logarithmic specification. A dummy variable (DUM) was included for the years 1973-74 and 1974-75 which are outliers due to adverse supply shocks emanating from the oil crisis. The estimated regression equation corrected for autocorrelation following the Cochrane - Orcutt procedure is given below.

* Shri Deepak Mohanty, Director, Department of Economic Analysis and Policy, collaborated with the author in preparation of this Appendix.

$$\begin{array}{lll} \text{LnP} = & 4.4420 + 0.3108\ \text{LnM}_3 & -0.5500\ \text{LnY} \\ \text{(t-value)} & (2.53)\quad (4.22) & (-2.75) \\ & + 0.7044\ \text{LnP(-1)} + 0.0623\ \text{LnDUM} & \\ & (7.28) \qquad\qquad (5.41) & \end{array}$$

$\bar{R}^2 = 0.99$ SEE = 0.03 D.W. = 1.60

Durbin's h- statistics = 1.08

Implicit income elasticity of money demand = 1.77

P = Wholesale Price Index,
M_3 = Broad Money

Y = Gross Domestic Product at 1980-81 prices.

3. The adequacy of the equation is evaluated in terms of estimated 't' ratio, overall goodness of fit measured by the coefficient of multiple determination R-Bar(sq), Durbin's h - statistic. The short-run and long-run elasticities of price with respect to broad money (M_3) and output (Y) estimated from the above equation are as follows :

	Elasticities with Respect to	
	M_3	Y
Short run	0.31	-0.55
Long run	1.03	-1.83

The empirical exercise shows that the long-run price elasticity with respect to money is almost unity and the implicit income elasticity of demand for money works out to 1.77.

4. Following Rangarajan (1988), on the basis of above equation a five-year moving average of both actuals and estimates in respect of price levels and the inflation rate have been computed. The detailed estimates are indicated in Table 1. The actual and estimated values of price levels

and inflation rate are plotted in Graphs 1 and 2 respectively.

5. It can be seen from Table 1 that during 1974-75 to 1979-80 the error between actual and estimated inflation rate varied in the wide range of -7.1 per cent to 8.8 per cent whereas following the moving average approach the variation in the error level was in the very narrow range of -0.6 per cent to 1.1 per cent. During 1980-81 to 1990-91, the error between the actual and estimated inflation rate varied in the range of -5.3 per cent to 4.4 per cent as compared to a narrow band of -2.0 per cent to 1.7 per cent following the moving average approach. Thus, in the Indian context it is possible to predict the average inflation rate in the medium term from the reduced form money demand equation.

6. The distributed lag effect on prices of a once-for-all change in the explanatory variable is given in the Table below :

Time Period	For a change in M_3,GDPR held constant			For a change in Y, M_3 held constant		
	M_{3t}	Pt	Pt-1	Yt	Pt	Pt-1
1	2	3	4	5	6	7
0	0	0	0	0	0	0
1	1	0.31	0	1	-0.55	0
2	0	0.22	0.31	0	-0.39	-0.55
3	0	0.15	0.22	0	-0.27	-0.39
4	0	0.11	0.15	0	-0.19	-0.27
5	0	0.08	0.11	0	-0.14	-0.19
6	0	0.05	0.08	0	-0.10	-0.14
7	0	0.04	0.05	0	-0.07	-0.10

It can be seen that the lagged effect of one per cent change in money supply gradually peters out in about four years.

References

1. Rangarajan, C. (1988), "Issues in Monetary Management", Presidential Address at the Conference of the Indian Economic Association, Calcutta, December.

2. Sarma, Y.S.R. (1991), "Money, Output and Prices", Reserve Bank of India Occasional Papers, Vol.12, Nos.3-4, September.

Table 1 : Moving Averages of Estimated Price Indices

	Levels						Percentage Variation					
	Wholesale Price Index			5-year moving Average			Year to Year			5-year moving Average		
year	Actual	Estimated	Error	Actual	Estimated	Error	Actual	Estimated	Error	Actual	Estimated	Error
1970-71	35.6	-	-	-	-	-	-	-	-	-	-	
1971-72	37.5	37.1	0.4	-	-	-	-	-	-	-	-	
1972-73	41.3	40.6	0.7	-	-	-	10.1	9.5	0.7	-	-	
1973-74	49.7	51.4	-1.7	50.4	50.0	0.5	20.3	26.7	-6.4	-	-	
1974-75	62.2	60.1	2.1	55.5	55.4	0.1	25.2	16.9	8.2	11.3	11.9	-0.6
1975-76	61.5	60.8	0.7	60.5	60.4	0.1	-1.1	1.1	-2.2	10.3	10.5	-0.2
1976-77	62.8	63.9	-1.1	63.7	64.2	-0.4	2.1	5.2	-3.1	6.3	6.6	-0.3
1977-78	66.1	65.7	0.4	66.8	67.4	-0.6	5.3	2.8	2.4	4.7	4.9	-0.2
1978-79	66.1	70.4	-4.3	72.7	72.5	0.2	0.0	7.1	-7.1	8.4	7.3	1.1
1979-80	77.4	76.2	1.2	80.1	79.2	0.9	17.1	8.3	8.8	10.0	8.8	1.1
1980-81	91.1	86.4	4.7	87.9	87.5	0.4	17.7	13.3	4.4	9.9	10.3	-0.4
1981-82	100.0	97.3	2.7	97.2	95.8	1.5	9.8	12.6	-2.9	11.4	9.8	1.6
1982-83	104.9	107.2	-2.3	105.8	104.9	0.9	4.9	10.2	-5.3	9.3	9.8	-0.6
1983-84	112.8	111.8	1.0	112.6	113.6	-1.0	7.5	4.3	3.2	6.6	8.6	-2.0
1984-85	120.1	121.7	-1.6	119.2	121.9	-2.7	6.5	8.8	-2.3	5.8	7.3	-1.5
1985-86	125.4	130.3	-4.9	126.9	129.9	-3.0	4.4	7.1	-2.7	6.5	6.6	-0.1
1986-87	132.7	138.4	-5.7	135.2	138.5	-3.3	5.8	6.2	-0.4	6.5	6.7	-0.3
1987-88	143.6	147.3	-3.7	144.3	147.5	-3.2	8.2	6.5	1.7	6.7	6.5	0.1
1988-89	154.3	154.8	-0.5	155.8	157.2	-1.4	7.5	5.1	2.4	7.8	6.5	1.3
1989-90	165.7	167.0	-1.3	170.9	169.6	1.2	7.4	7.9	-0.5	9.4	7.8	1.7
1990-91	182.8	178.4	4.4	187.9	185.0	2.9	10.3	6.9	3.5	9.8	8.8	1.0
1991-92	207.9	200.7	7.2	-	-	-	13.7	12.5	1.2	-	-	
1992-93	228.8	224.2	4.6	-	-	-	10.1	11.7	-1.6	-	-	

The Estimates are from the following equation fitted for the years 1970-71 to 1992-93.

$$LnP = 4.4420 + 0.3108\ LnM_3 - 0.5500\ LnY + 0.7044\ LnP(-1) + 0.0623\ Idummy$$

(t-value) (2.53) (4.22) (-2.75) (7.28) (5.41)

R(sq) = 0.99 SEE = 0.03 D.W. = 1.60 h statistics = 1.08

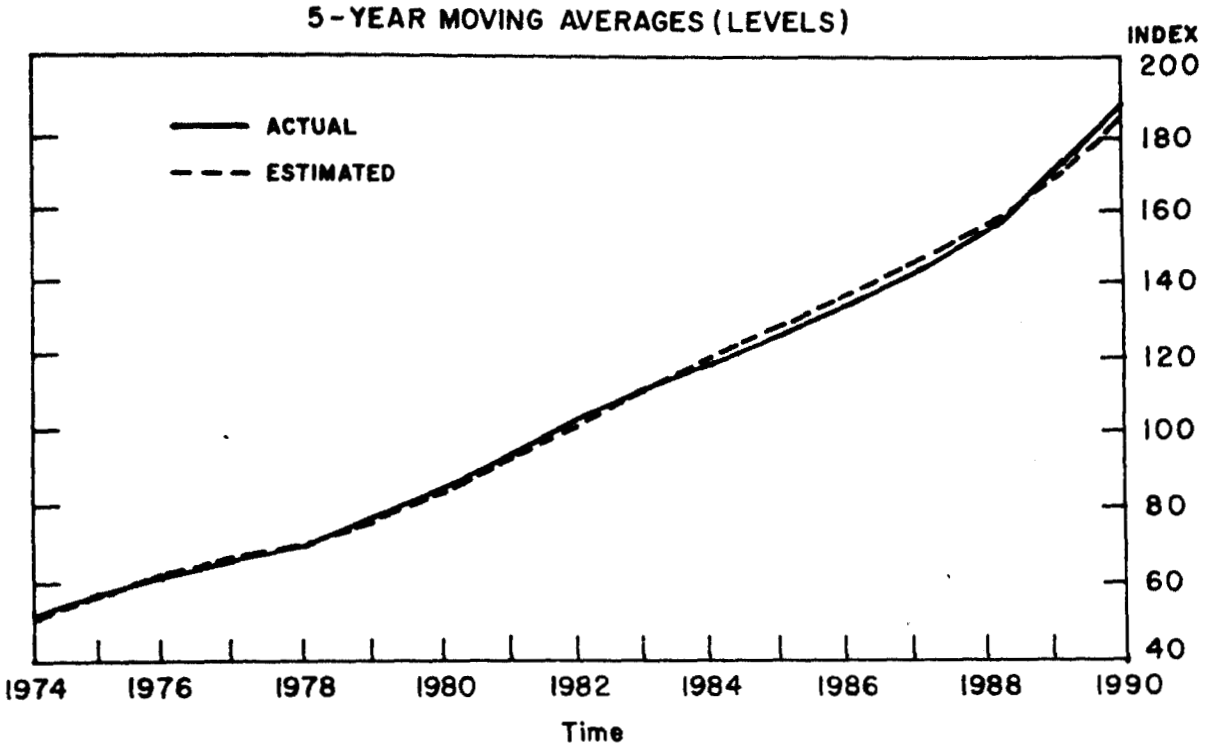
Implicit income elasticity of money demand = 1.77

P = Wholesale Price Index, M_3 = Broad Money, Y = Gross Domestic Product at 1980-81 prices

Dummy for 1973-74 and 1974-75.

GRAPH 1: INDEX OF WHOLESALE PRICES

5-YEAR MOVING AVERAGES (LEVELS)



GRAPH 2: INFLATION RATE

5-YEAR MOVING AVERAGES (VARIATIONS)