

Ninth V.T. Krishnamachari Memorial Lecture on "The Role of Monetary Policy" delivered by C. Rangarajan Governor, Reserve Bank of India at The Institute of Economic Growth Delhi on Tuesday, 11th November 1997

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1. It is a great honour to be invited to deliver the 9th V.T.Krishnamachari Memorial Lecture. As you all know, Mr.Krishnamachari was a distinguished civil servant who left his imprint on many walks of India's life. The princely States of Baroda and Jaipur gained immensely from his keen administrative abilities. In 1953, he was appointed as the Deputy Chairman of the Planning Commission which fact itself was a recognition of the importance attached to the implementation of Plans. Mr.Krishnamachari was very clear that the mind-set of administrators must change in an era of economic development. As he put it "the administrator must be willing not only to teach them who are uneducated. He has also much to learn from them". He wanted the administration to be based on co-operation rather than coercion. What he said forty years ago are still relevant today.
2. It is a great honour once again to have Dr.Manmohan Singh to preside over this meeting. Truly he is recognised as the main architect of the reform process. Today everyone talks in terms of possible growth rate of 7 per cent or 7 per cent plus. A decade ago, even achieving a growth rate of 5.5 per cent was considered to be optimistic. This change in the rhetoric and economic agenda is a reflection of the fundamental change that has been achieved in this country for which this country will ever be grateful to Dr.Manmohan Singh.
3. Today I have chosen to speak to you on the role of monetary policy in India - a subject which has aroused a great deal of interest among the academicians, professionals and policy makers in the recent years. Only a few weeks ago we announced the monetary and credit policy for the second half of 1997-98. In this policy statement, we have reaffirmed that monetary policy would seek to attain the twin objectives of promoting price stability and growth in the economy. In fact these are the goals which have always underlined the conduct of monetary policy in India. In the context of the current economic scene, several issues have been raised regarding the objectives and conduct of monetary policy. In fact, this debate is not unique to India. World over there has been a renewed interest in the conduct of monetary policy, with more and more countries committing themselves to maintain a low and stable rate of inflation in their economies.
4. Monetary economics is not a settled science. There are continuing debates on several issues connected with monetary policy. Some of these questions are: what are or should be the objectives of monetary policy? Does the objective of price stability conflict with the goal of achieving faster rate of economic growth? Can monetary policy by itself ensure price stability? What should be the intermediate target of monetary policy? How should monetary policy be implemented? What are the respective roles of direct and indirect instruments of monetary control? I would like to address these questions against the backdrop of the theoretical developments as well as empirical evidences on the impact of monetary policy in India and elsewhere in the world.

The Goals of Monetary Policy

5. The first set of questions that needs to be addressed is: what are the objectives of economic policy and should the goals of monetary policy be the same as these objectives? Should all the goals of economic policy be the goals of monetary policy? The issue of objective has become important because of the need to provide clear guidance to monetary policy makers. Indeed this aspect has assumed added significance in the context of the increasing stress on autonomy of Central Banks. While autonomy has to go with accountability, accountability itself requires a clear enunciation of goals. Since the inception of development planning, the broad objectives of India's economic policy have been to achieve a faster rate of economic growth, ensure a reasonable degree of price stability in the economy and promote distributive justice. The working of monetary policy in India over the past several decades would reveal that monetary policy has also emphasised these broad objectives of our economic policy. What is, however, important to recognise is that all the objectives cannot be effectively pursued by any single arm of economic policy. As is well known in economic policy, there should be as many instruments as there are objectives if all objectives are to be fulfilled. Faced with multiple objectives that are equally relevant and desirable, there is always the problem of assigning to each instrument the most appropriate target or objective.
6. It is clear from both the theoretical literature and empirical findings that among various policy objectives, monetary policy is best suited to achieving the goal of price stability in the economy. It has also been recognised that, in the long run, the objective of price stability and growth do not necessarily conflict with each other. Rather in today's altered economic context, a low and stable price environment is being increasingly regarded as an essential condition for improving the growth and productive potential of the economy. As a noted monetary economist had once observed

"The first and the foremost lesson that history teaches about what monetary policy can do - and it is a lesson of most profound importance - is that monetary policy can prevent money itself from being a major source of economic disturbance ... provide a stable background for the economy .. and contribute to offsetting major disturbances in the economic system arising from other sources".

7. Commitment to price stability does not mean a blind faith in maintaining a certain level of inflation, without concern for the need to maintain and accelerate growth. Far from it. In no country in the world has this been so. What this commitment implies is that monetary policy can help the growth process vastly by regulating money supply towards the direction of maintaining price stability in the economy and helping the economy to recover from independent shocks. Opinions, however, differ when growth and price stability are seen as two competing objectives of monetary policy. At a more fundamental level it is even asked whether inflation is a monetary phenomenon and what would happen if money supply is increased to boost credit and growth in the economy. Let me examine these two issues first.

Inflation and Money Supply

8. In a monetary economy, where each single transaction is valued in terms of the unit of national currency, it is nothing but a truism to say that money supply has a role in determining the price level in the economy. Analytically viewed, in the short run, with output fixed, the price level is essentially determined by the excess demand condition in the economy, which depends on the level of demand for and supply of real money balances. It is thus natural that once the real money balance is increased above what is demanded by people the pressure would be felt on the demand for goods and services or assets, leading to an increase in their prices. Although this exposition of the money and price relationship is familiar to all of us, there is no denying the fact that changes in the price level can be caused by several other internal and external shocks, which influence

the cost structure of firms. However, a continuous pressure on prices, which is what inflation is all about, cannot be sustained, if there is no accommodating increase in money supply. It is in this sense that inflation is a monetary phenomenon. I would, however, add three important qualifications to this statement. First, there could be a variable lag between the time a monetary change is initiated and the time its ultimate impact on prices and output is felt. The length of this lag is determined by the inherent dynamics in the real sector and the speed with which economic agents adjust to a change in monetary situation. Therefore, a monetary shock may take several months to express itself on prices and output. Second, it is also essential to differentiate between a relative price change and its immediate impact on overall price situation, on the one hand, and the persistent increase in prices on the other. The former effect can be caused by a sudden shock to the cost structure of a firm, which may raise the price of its product relative to others, causing some reallocation of resources and at the same time raising the overall price level in the economy to some extent. However, given the size of nominal demand, which is largely determined by the growth of real income and the money supply, a relative price shock cannot cause a sustained increase in the overall price level in the economy. For this to happen, it would require a concomitant increase in money supply. This is the reason why the overall price effect of an increase in administered price tends to be higher when monetary policy is already slack and there exists an inflationary pressure in the economy. It is, therefore, important to recognise that from the medium to long run perspective, controlling money supply growth becomes integral to contain inflationary pressure in the economy. As John Crow, the former Governor of Bank of Canada has noted -

"The reason Central Banks persistently focus on inflation, monetary aggregate targets, is not that they view inflation as the only significant economic issue facing modern industrial states. Far from it. More reasonably, they take the considered view that what they are unavoidably responsible for - managing primary liquidity and in that crucial sense in creating money - will in the end also be the crucial factor in what happens to inflation, and that good inflation performance is a plus for the economy as a whole".

9. Third, the effectiveness of monetary policy in causing an impact on the price level also depends on inflation expectations. For example, while the expansionary effect of fiscal policy will not persist for long without an accommodating increase in money supply, the interest rate effect may, however, get sustained, giving rise to inflation expectations, and thereby adversely affecting the effectiveness of monetary policy to fight inflation.
10. Given the above theoretical backdrop what are the empirical relationships between inflation and money supply growth in the Indian economy? Many studies have shown that the relationship between prices on the one hand and income and money supply on the other is found to hold reasonably well over a period of time. Averages of price changes 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 sufficient guide to policy. Seeking to find a direct year to year correspondence between changes in money supply and real income and the price level is a simplistic approach to the problem which overlooks the inherent lags in the functioning of an economy. Apart from my earlier studies in this regard which I had reported in my presidential address to the Indian Economic Association in 1988 and the Lakdawala Memorial Lecture in 1994, the price equation estimated using the data for the period 1972-73 to 1993-94 shows that prices move in tandem with money supply in the long run¹.

Price Stability and Growth : Is there a Trade-off ?

11. Let me now turn to the argument that the attempt to reduce the inflation rate may affect output growth in the economy. This raises the question as to what relation can one

expect between money supply growth and the output growth in an economy or to put the question differently, can money be considered neutral in relation to real economic variables? Answering this question would require understanding the process of economic growth itself and the forces that bring about equilibrium in the real economy. Most growth theories are non-monetary in nature. They assume growth to depend on such real factors as capital accumulation, population, technology and innovation. Clearly in this context, money has no role in either initiating or sustaining the growth process. Despite the money neutrality assumption in growth theories, economic research and public policy have hardly supported this proposition as true. In fact as Oliver J. Blanchard observes in the opening remark in his survey paper on money and output,

"Much of research on economic fluctuations has focussed on the effects of nominal money on output. This is not because money is the major source of movements in output; it is not. Rather it is because economic theory does not lead us to expect such effects. Indeed it holds that with flexible prices money should be approximately neutral, with changes in nominal money being reflected in nominal prices rather than in output".

12. The perception regarding the money neutrality proposition, however, underwent a significant change with the Keynesian revolution, which emphasised that nominal wages are relatively more rigid than prices, so that an increase in money supply will decrease real wages and bring down unemployment. This idea was later given an empirical justification by A.W. Phillips through his celebrated Philips curve relationship between the wage rate or inflation rate and the unemployment rate.
13. The well known Phillips curve which became the centre of discussion of such a 'trade-off' in the 1950s and 1960s has been theoretically and empirically invalidated in many countries, since the onset of a prolonged period of stagflation in the 1970s. Its demise was partly because of the weak theoretical foundation on which it was based, as it ignored the role of expectations in the economic system, and partly because the relationship did not empirically hold good in many countries, including UK and the US in the 1970s and 1980s. This is, however not to say that there is no relation between inflation and growth. The 'trade-off' is seen to exist at best in the short run. Given the slow pace of adjustment between peoples' expectation about certain events and their actual occurrences, there is always a possibility of a short run 'trade-off' between inflation and unemployment. But since there are obvious long run implications of such an option, it is important that this short run possibility is not exploited in a manner that it introduces long run instability.
14. Empirical research on inflation and growth linkage in the cross-country setting though not conclusive, leads to a general finding that inflation adversely affects growth in the long run. A recent study in the cross-country framework by Professor Robert Barro reported that over a long time period of 30 years, a 10 percentage point permanent increase in inflation rate is estimated to bring down the level of real GDP by 4 to 7 per cent. There is, however, some inconclusiveness about the empirical evidences on the short-run relationship between price stability and growth. Notwithstanding this, the experience of some of the fastest growing developing countries such as Malaysia, Singapore and Thailand showed that their consistent achievement on the growth front in the recent years, in the range of 8 to 9 per cent, could come about with an inflation rate of 3 to 5 per cent. Empirical studies on inflation and growth normally do not take into account the hidden costs of inflation, while evaluating the short run or long run 'trade-off' between price stability and output. If all efficiency costs and welfare costs of inflation were to be quantified and given due weight, the 'trade-off' would become even more unfavourable for growth. International evidences also suggest that inflation rate beyond a threshold has significant adverse implications for growth. But, what the appropriate inflation threshold beyond which costs tend to exceed benefits needs to be estimated for each country separately. Nevertheless, people worry about even moderate inflation levels because if not held in check, a little inflation can lead to higher inflation and eventually affect growth.

15. It is important to note that while an increase in money supply beyond what is consistent with the growth in real income, could improve the credit availability, reduce the interest cost and promote investment and growth in the short run, but the impact cannot be sustained for a long period. The ultimate effect will be a rise in inflation rate. A recent macro-econometric model for the Indian economy for the period 1970-71 and 1993-94, simulated by us shows that an increase in investment spending financed by money creation while has a positive effect on output, this effect is significant only in the short run². In the long run prices rise at a faster rate. A 10 per cent sustained increase in public investment in the non-agricultural sector over the reference simulation financed by an increase in net RBI credit to Government increases the money supply by 5.3 per cent, real capital stock in non-agricultural sector by 1.0 per cent, price level by 1.3 per cent and real income by 0.7 per cent, on an average, during the first two years of the shock. In a span of 18 years, the average rate of increase in price level accelerates to 18.1 per cent, while output growth averages around 2.7 per cent showing the severe inflationary outcome of this policy option. Moreover, there is also an adverse external implication of this financing policy, as it leads to a deterioration in the current account deficit in the balance of payments through import leakage and loss of competitiveness of exports. What this policy scenario implies is that a high and disproportionate growth in money supply, whatever may be its origin, will in the long run, worsen both the internal and external balance in the economy. This needs to be weighed against the 'trade-off' that it may have in terms of output gain in the immediate short run.

Sustaining a High Level of Growth: What can Monetary Policy do ?

16. With the accumulation of evidences regarding what monetary policy can and cannot do, there has been a change in public perception about the role of monetary policy in promoting growth. In the recent years, there has been a growing realisation in both developed and developing countries that long run growth constraints are largely the outcome of structural rigidities in the economic system which distort incentives and price signals and promote inefficiency. The experience of some of the fast growing developing economies as well as some developed economies demonstrate that micro level reforms targeted at removing specific structural rigidities, a macro-policy environment aiming for increased competition, technological upgradation, a proper incentive structure and a stable price environment play a crucial role in achieving and sustaining high rates of growth. In today's world, the nature of the working of economies has changed radically due to the pressure of competition and globalisation. This has made firms extremely conscious of price competition. Since firms, workforce and countries compete at the margin, public policies for providing a stable background to the economy have assumed a critical importance for promoting growth and productivity. These developments have made the countries, across the world, more conscious of the hidden costs of inflation and their adverse implications for growth. Perhaps the single most important contribution that monetary policy can make under these conditions is to maintain a low and stable rate of inflation that would provide the necessary condition for promoting competition, efficiency and growth in the economy.
17. The case of price stability as the dominant objective of monetary policy therefore rests on the assumption that volatility in prices creates uncertainty in decision making. Rising prices affect adversely savings while they make speculative investments more attractive. The most important contribution of the financial system to an economy is its ability to augment savings and allocate resources more efficiently. A regime of rising prices vitiates the atmosphere for promotion of savings and allocation of investment. Apart from all of these, there is also a social dimension. Inflation affects adversely those who have no hedges against inflation and that includes all the poorer sections of the community. Of

- course, a critical question in this context is at what level of inflation the adverse consequences begin to set in.
18. In a resource constrained economy like ours, monetary policy would also have to play an active role in ensuring adequate flow of credit to the essential sectors of the economy. Since by now the restrictions on banks in the matter of credit flows have been by and large removed, cash reserve ratios on banks has been substantially reduced and the corporate sector has started accessing funds from domestic and global capital markets in a big way, the industrial sector no longer comes under the credit-constrained behaviour. Under this environment monetary policy is expected to work through the interest rate channel in promoting the expansion of credit and overall investment activity in the economy. Indeed, this has remained the focussed objective of the recent monetary policy initiatives which made interest rate as a signalling device, provided a free hand to commercial banks in the determination of lending rates and substantially improved the liquidity condition in the economy with a view to bringing down the level of interest rate. Responding to these initiatives, the prime lending rates of commercial banks have come down steadily from the level of 17 per cent in 1993-94 to the range of 12.5 to 13 per cent by November 1997 so far, after the announcement of the monetary and credit policy for the second-half of 1997-98. The interest rate in the Government security market has also seen a significant reduction, with the 364-day Treasury bill rate declining by as much as nearly 5 percentage points between April 1996 and October 1997 and that on longest dated securities showing a reduction of about 3 percentage points between March 1996 and October 1997.
 19. Interest rate responds to several factors and the nominal interest rate comprises of three important elements - (i) real interest rate, (ii) inflation expectations, and (iii) a discount factor for uncertainties. In this sense real interest rate is not an observed variable. Real interest rate is influenced by several long-term factors such as saving and investment balance in the economy and the rate of return on capital. On an economy wide basis this should be equal to real rate of growth. The effectiveness of monetary policy to bring down the nominal interest rate will depend on the impact that this policy will have on inflation expectations and on the perception of uncertainty in the economy. As the experience of many countries have shown, an excessive expansion in money supply to bring down interest rate can lead to the hardening of the nominal interest rate due to a rise in inflation and inflation expectations. This is not to say that interest rate cannot and should not be influenced by monetary policy. It can and will be. But the essential point to note is that the only enduring way of bringing down the nominal interest rate is by keeping the inflation rate low so that inflationary expectations are broken and the uncertainty element is reduced.
 20. Given the basic goal of the central bank to maintain price stability, an important question arises as to what should be the intermediate target chosen to influence inflation rate. It is even asked whether an intermediate target or any target as such is required for such a purpose. While it is entirely conceivable not to have any formal target, but it is practically impossible to pursue the monetary policy goals without an announced target. A monetary policy target, whether intermediate or final, carries important signals to the market, conveys the monetary policy stance in unambiguous terms and helps anchoring inflation expectation in the economy. On the question of whether to have an intermediate target there is no standard answer since the choice is dependent on the country specific situation and the kind of relationship between various monetary indicators and inflation rate. In the west, several countries have switched over from intermediate monetary target to final inflation target because of the observed instability of the demand function for money, leading to uncertain relation between monetary aggregates and inflation rate. There are two types of criticisms which have been often cited against the targeting of monetary aggregates. First is the explanation provided by the Goodhart's law that "any observed statistical regularity will tend to collapse once pressure is placed upon it for control purpose". This is an extension of the famous Lucas critique which implied that people's optimal decisions are influenced by the policies themselves, leading to unstable economic relations, but consistent policy rules will provide stable economic behaviour.

- The Goodhart's law poses only an empirical question whether money demand function is reasonably stable for it to be useful to predict inflation rate? Second, the other limitation of the monetary targeting approach pointed out by many is that financial innovations have radically changed the portfolio behaviour of economic agents, leading to a breakdown of the relation between monetary aggregates and inflation rate.
21. In India, our experience shows that money demand function is a stable function of select variables and it can be used to reasonably predict inflation. Several statistical functions of the demand for money estimated by using the equilibrium and disequilibrium analysis provide overwhelming evidence on the long run stability of the money demand function. A recent study conducted by the Development Research Group (DRG) of Reserve Bank of India which specifically tested the impact of financial deregulation in the Indian economy on the demand for money in the cointegration framework stated that "there exists a long run relationship between money and its determinants namely exchange rate, interest rate, inflation rate and real output"³. Another study conducted by DRG stated that "cointegration tests confirm that broad money stock, output and prices have stable long run linkages. Disequilibrium analysis highlights the inherent tendency of money demand to revert to its steady state. In comparison to notorious missing money experienced in the Western countries, money demand in India has been less volatile"⁴. Other researchers have also reached similar conclusions using different specifications, sample periods and data frequency [for example Nag and Upadhyay (1993) and Joshi and Saggar(1995), in the Reserve Bank of India Occasional Papers]. The extent and pace of financial innovation in India are not such as to affect the stability of money demand behaviour. The concept of monetary targeting that we have been using is a flexible one which takes into account various feed-back effects. Money supply target is relatively well understood by public and provides unambiguously the stance of monetary policy. It is also important to note that while a target range for M3 growth provides the annual or medium term context of monetary policy, Reserve Bank will need to watch closely the behaviour of interest rates in the various markets. In fact, with the inflation rate coming down and remaining in a narrow range, it becomes possible to focus on interest rate alongwith overall monetary growth. Interest rate targetting becomes a possible course of action only when inflation rate remains in a narrow range.

Conclusion

22. In what I have discussed today as the role of monetary policy, I have laid stress on one important aspect of our monetary management. Inflation control policies should not be viewed as inimical to growth promotion policies. Monetary policy remains an important instrument through which both the objectives can be achieved. The developments in the recent years have shown that we have been able to contain the inflationary pressure on the economy, while maintaining a sustained improvement in growth. The growth rate in the real GDP which exceeded 7 per cent successively for two years in 1994-95 and 1995-96, was again close to that figure in 1996-97. It is during this period, that a substantial improvement has also taken place in the price situation, with the annual rate of inflation (as measured by variations in the Wholesale Price Index) declining steeply from 10.9 per cent in 1994-95 to 7.8 per cent and 6.4 per cent in 1995-96 and 1996-97, respectively. The price situation has shown a much stronger improvement in 1997-98, as the inflation rate as on October 25, 1997 reached 3.4 per cent on the financial year average basis and 3.5 per cent (annualised) on a point-to-point basis. This is the lowest inflation rate recorded in the Indian economy during the past several years. We also have the lowest interest rates in recent period. The moderation in inflation rate that we are seeing now is not a matter of accident. It is a vindication of the policies that we have pursued.
23. What the policy has been seeking to do is to modulate money supply growth consistent with expected real growth. When the money supply growth is targeted at 15 to 15.5 per cent, it is wrong to assume that monetary policy is restrictive in its impact on the

aggregate demand condition in the economy. Such an order of growth in money supply is consistent with an expansion in the credit of the order of 20 per cent. In fact even in 1995-96, the non-food credit expansion was 22.5 per cent. Ensuring price stability requires the pursuit of a consistent policy over a period of time. This may at times make the central bankers unpopular. But this is a cross they have to bear. The need to take a view which is not short term has indeed been one of the arguments advanced for greater autonomy for central banks.

¹ The price equation can be modelled as an inverted money demand function. The empirical estimate of the price equation in the Indian context for the sample period 1972-73 to 1993-94 is as follows:

$$\begin{aligned} \text{LnP} = & 2.407 + 0.387 \text{ Ln YR} + 0.253 \text{ Ln M3} + 0.738 \text{ LnP}_{(-1)} + \\ & 0.073\text{DUM74} + 0.153\text{DUM80} \\ & (2.185) \quad (-1.877) \quad (3.524) \quad (7.797) \quad (2.185) \\ & (5.892) \\ R^{-2} = & 0.99, \quad h = -1.56, \quad \text{SEE} = 0.03, \quad \text{mean} = 3.99 \end{aligned}$$

Where P is the index of wholesale prices, YR is real GDP at factor cost,, M3 is broad money and DUM 74 and DUM 80 are two Dummies for inflation outliers representing oil price shocks. Figures in brackets are t-statistics of the coefficients. The long-run elasticity of price with respect to money supply works out to near unity (0.97).

² C.Rangarajan and M.S.Mohanty (1997), "Fiscal Deficit , External Balance and Monetary Growth - A Study of the Indian Economy, Working Paper, Reserve Bank of India (forthcoming).

³ Ashok Parikh (1994) "An approach to Monetary Targeting in India". Development Research Group Study No.9, Reserve Bank of India.

⁴ R.R. Arif (1996): `Money Demand Stability: Myth or Reality - An Econometric Analysis". Development Research Group Study, No.13, Reserve Bank of India.