Money supply has a strong bearing on the objectives of economic policy namely (a) growth, (b) social justice implying a more equitable distribution of income and (c) price stability. With this in view, this study examines the growth in the components of money supply and its impact on GDP and price level through deficit financing. In this chapter, an attempt is made to review the earlier studies on the subject.

The chapter is presented in two sections. In Section I, the key concepts used in the study are explained. In Section II, past studies related to money supply, growth and inflation are reviewed.

SECTION - I - CONCEPTS

Important concepts used in this study are defined and explained below.

Money:

The concept of money dates back to 3016 B.C.\(^1\) Money has remained a complex concept. Economists have attempted to give functional and legal definition for the concept.

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of money. Walker\(^2\), Withers\(^3\), Sidgewick\(^4\) and others have attempted to define money on the basis of its functions. Walker observes that "Money is what money does"\(^5\). Hawtrey\(^6\) in Britain and Knapp\(^7\) in Germany have given a legal definition of money. Hawtrey defines money as the means exhibited by law (or by custom having the force of law) for the payment of debt\(^8\). But commonly both have agreed that money is anything that is generally acceptable in exchange for goods and services. It is on the lines of Crowther\(^9\). Seligman\(^10\) also defines money as a thing that possesses general acceptability in exchange for goods.

Johnson\(^11\) and Fiege\(^12\) have indicated four important approaches to define money. They are (1) Conventional approach, (2) Chicago approach, (3) Gurley and Shaw approach and (4) Central Bank approach.

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6. R.G. Hawtrey, op.cit. P4
7. Knapp, as quoted in T.T. Sethi
1) Conventional approach defines money as currency plus demand deposits in commercial banks, which emphasizes on liquidity.

2) The Chicago approach defines money as a temporary abode of purchasing power. It comprises of currency and total commercial bank deposits on the basis of close substitutability argument.

3) Gurley and Shaw approach defines money to include liquid assets, which are available in the form of liabilities of non-bank financial intermediaries as well. Gurley and Shaw also distinguish between "inside" money and "outside" money. It is also based on Chicago concept of close substitutability. Outside money refers to an asset. It comes from outside the private sector. But there is no debt corresponding to it. In other words, it is an asset without being a debt for any one else. Gold coins and currency may best be cited as examples for outside money. On the other hand, inside money refers to assets with liabilities. Bank deposits, credit created by financial intermediaries are assets with debt. These also perform the functions of money. Hence according to the degree of closeness and its substitutability, weights are assigned to distinguish the different types of inside money.
4) The fourth approach considers money as a means of financing purchases in much broader concept, measurable or unmeasurable. It includes the reserves available with the central bank in the measurable component and liquid assets available in the economy as unmeasurable. This is an agreement with the Radcliffe\textsuperscript{13} Committee's concept of liquidity of the economy.

From the above approaches and definitions given by economists from time to time, it could be understood that money is a liquid asset. Liquidity enables negotiability in the trade or transaction sense. It should enable its holder, without any inconvenience or any risk of loss, to use it as a medium of exchange, unit of account, store of value and easy transferability as a standard of deferred payment. These are the four functions of money.

In the Indian context, Reserve Bank of India (RBI hereafter) is the custodian as the Central Bank of the country to issue, control and regulate money. Rupee is the unit of account and legal tender currency. While providing data on money supply through \textquotedblleft Money stock

measures" RBI included in the supply, currency with the public, other deposits with it, and bank money or net demand deposits of other banks. Then money is defined as the currency with the public in the form of notes and coins with 'a rupee' as unit of account and notified as legal tender. However, such instruments as deposits in savings and current deposits available for withdrawal at short notice by cash or by cheque, drafts, etc., could be included to qualify as money. Appointed by RBI, the Second Working Group (1977) for defining money, identified four measures of money stock on the basis of their extent of liquidity and listed them as important for monetary policy analysis. They are called $M_1$, $M_2$, $M_3$ and $M_4$. These definitions are currently in official use and are used for the present study. They are described in the next chapter for convenience in reference. When money is viewed as a medium of exchange and store of value, its demand deserves attention.

**Demand for Money**

Demand for money arises from the functions of money. Classical economists stressed the 'medium of exchange' function to denote the transaction purpose for which money is demanded. But later economists like Marshall, Pigou and Robertson from the Cambridge tradition explained

demand for money from store of value function of it. Money is not merely to be spent, it can be held as a form of wealth or asset which can be most easily converted into any other form of wealth at any time. According to Samuelson, it is needed for its own sake as also in other forms of wealth.

For practical purposes the total demand for money balances may be explained in terms of total value of goods, services and securities that will be purchased with money within a specified period of time. Thus, as output grows, demand for money also grows. This was considered inadequate by Keynes who found speculative motive also an important source of demand for money. If rate of interest is attractive, people may hold money in the form of deposits and keep lesser amount in cash. Thus demand for money balances has both a direct relationship with income and an inverse relationship with rate of interest.

**Supply of money**

Shapiro\(^ {15} \) defined the supply of money as the total currency amount of all those things that are generally acceptable by the public in payment for goods, services and other valuable assets and for the discharge of debts.

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Dornbush and Fisher\textsuperscript{16} used the terms $M_1$ and $M_2$ to define money supply which consisted of currency and also demand deposits. Currency consisted of notes and coins in circulation, most of it in the form of notes whereas demand deposits are deposits against which 'checks' could be written in commercial banks and thrift institutions.

Branson\textsuperscript{17} defined money supply to include $M_1$ which comprised of currency plus demand deposits. He also stated that, concept of money supply would be complete only if it included the broad money, viz. $M_2$ which added to $M_1$ the savings deposits at commercial banks, savings and loan associations, and mutual savings banks.

In the Indian context, supply of money could be understood by making a distinction between 'Ordinary Money' ($M_1$) and 'High Powered Money (H). While ordinary money consists of currency with public and demand deposits held by banks, high powered money is the money produced by RBI and / or the Governments and held by the public. In the process of credit creation, banks keep a fraction of deposits as reserve with the RBI helping it regulate credit supply from time to time in accordance with the needs of the economy. Thus the reserves maintained by

\textsuperscript{17} H. William Branson, \textit{Macro Economic Theory and Policy}, (New Delhi : Universal Book Stall,, 1979) P.58
the commercial banks and cooperative banks, form part of money supply. This is also called "Reserve Money" (RM). The "Money Multiplier" theory is based on this fraction of reserve money which influences supply of money. Money stock measures as given by RBI viz. $M_1$, $M_2$, $M_3$ and $M_4$ relate to the supply of money (a flow concept) during a period. Stock is always discussed at any particular moment of time.

Through the discussion of money, money stock measures, functions of money, demand for money, supply of money, it could be seen that supply of money receives wide attention because its balance with the demand for money determines the price level and the real value of money as expressed by its purchasing power. It is more amenable for policy than the demand for money. When the supply exceeds demand, it pushes up the price of goods and services and in turn the general price level. A persistent rise in this general price level is called inflation.

**Inflation**

According to Dornbush and Fisher\textsuperscript{18}, inflation is the rate of change of the price level. The concept of inflation has undergone considerable modification over the years. To the neo-classical economists, inflation resulted in

astronomical rise in prices, a complete loss of confidence in the currency and breakdown of the monetary system. It is known today as hyper inflation. According to them, inflation was regarded as a disease, caused by monetary mismanagement\textsuperscript{19}. According to Wicksell, inflation is a cumulative process of price rise\textsuperscript{20}. According to Ritter and Silber\textsuperscript{21}, the classic explanation of inflation is that too much money is chasing too few goods.

In simple terms, when the supply of money increases at a higher rate than the rate at which output rises, price level starts rising. This rising price level is attributed to a pure monetary phenomenon by monetarist school of economics. Such a view is disputed by economists of structuralist school. According to them, inflation is a dual process. It unavoidably has a monetary dimension. But at the same time prices are determined by costs, meaning that social conflict over values of inputs such as the nominal wage and exchange rates and rules for contract indexation combine to force up the price level\textsuperscript{22}.

\textsuperscript{21} Ritter & Silber, op.cit.P.69.
\textsuperscript{22} Taylor, op.cit.P.86.
In the view of Shapiro\textsuperscript{23}, inflation is a rising price level, the price level being a figure that changes as the outlay needed to purchase an assortment of specific quantities of different goods and services increases. He observed that the rate of inflation can be measured by four measures, viz. the consumer price index (CPI), the producer price index (PPI), the gross national product implicit price deflator (GNIPD) and the personal consumption expenditure implicit price deflator (PCEIPD). Of them, the GNP deflator was seen to have the broadest coverage and therefore to most closely approximate the rise in price level.

Brooman\textsuperscript{24} defines different types of inflation viz. 'creeping inflation', which is characterised by an annual rate of rise in price level by 6% or less, 'trotting inflation' when the annual rate of rise in price level lies between 15% and 30% and 'galloping inflation', when price level rises from 50% to 100%.

Crowther\textsuperscript{25} defines inflation as a state in which the value of money is falling, i.e. prices are rising.

Pigou\textsuperscript{26} has related the phenomenon to a rise in monetary income rather than in prices. He further states

\textsuperscript{23} Shapiro, op.cit.P.171.
\textsuperscript{25} Crowther, as quoted in T.T. Sethi, op.cit.P.232.
\textsuperscript{26} A.C. Pigou, The Veil of Money as quoted in T.T. Sethi, op.cit.P.334.
that "inflation exists when money income is expanding more than proportional to income earning activity"²⁷.

According to the Quantity theorists²⁸, inflation is synonymous with an increase in the quantity of money on the extreme assumption of fixed velocity and transactions. Such an increase would necessarily raise the price level, which is the effect of inflation, not the thing itself. Keynesian writers define inflation as an excess of aggregate demand over supply in conditions of full employment, in a closed economy with low levels of stocks and no institutional barriers to price increases. This will certainly cause prices to rise - but it is the excess demand which is inflation, the increase in prices being merely the symptom which indicates its existence. However, excess demand may not lead to increase in the price level in an open economy, where it could be met by expanding imports, so that as long as it was possible to finance a balance of trade deficit the price level would remain unchanged. For these reasons, Brooman²⁹ argued that, it would be desirable to have a definition which refers to the phenomenon to be explained, i.e. the rise in prices rather than to any of its possible causes, the word inflation would then be used to mean no more than continuous rise in the general price level.

²⁹. Ibid
According to Makinen\textsuperscript{30}, inflation is defined as a sustained rise in a broadly based index of commodity price, over some period of time.

Ackley\textsuperscript{31} defines inflation as a persistent and appreciable rise in the general price level or average of prices and that definition is precise and easily measurable by the rate of change in general price level.

For the present study, inflation is therefore defined as a persistent rise in the general price level, emphasis is on persistent rise, hence any high price is not inflation but an uptrend in price level is. Again it refers to general price level and not to price of any specific good or service. The term 'general' again refers to a weighted average of price rises of all goods and services. In other words, the concept is so comprehensive as to be the aggregate of all prices, it makes no difference between intermediary and final goods. For practical purposes the general price level is measured as the ratio of nominal GNP (i.e. GNP at factor cost at current prices) to the real GNP (i.e., GNP at factor cost at constant

\textsuperscript{30} E. Gail Makinen, \textit{Money, the Price Level and Interest Rates - An Introduction to Monetary Theory} (New Delhi: Prentice Hall of India, 1977) P.314.

1980-81 prices); for the study it is expressed as a percentage.

Once inflation is objectively measured, it is possible to study its relationship with economic growth and money supply.

**Economic Growth**

The terms economic growth and economic development are used interchangeably, but they do not have identical meanings. To be clear, it is essential to define them. Economic growth is defined as a sustained and substantial rise in product per capita by Kuznets. According to Meier, economic development is a process whereby an economy's real per capita national income increases over a long period of time. The term economic development has two meanings. One, it refers to economic growth plus improvement in the distribution of material welfare within the low income countries and second, the complex effects of growth planned or unplanned, on the kinds of goods produced, the methods of producing them and employment patterns. So, development is a process where growth occurs and benefits the population; its welfare implication should not be missed.


Alan\textsuperscript{34} defines economic growth as the rate at which the annual national output of goods and services increases in 'real', as opposed to 'money' terms.

According to Halcrow\textsuperscript{35}, economic growth may be measured either as a rate of increase in goods and services per capita or as a rate of increase in the national output of goods and services, ignoring population growth.

For this study the economic growth represents the annual increase in the national output of all the goods and services produced in the country measured at constant prices. In practice, official figures of Gross National Product at factor cost at 1980-81 prices is used to measure the economic growth.

The overall growth in the economy is the result of the growth in all the economic activities performed in different sectors of the country. They are to include agriculture, industries and all other sectors. Therefore concept of growth can be applied to the sectors and to the aggregate, i.e. sectoral growth and growth of the economy as a whole.

\textsuperscript{34} Morrice Alan, \textit{The Fundamental of Economics} (London : Heinemann, 1972) P.7.
SECTION II - REVIEW OF PAST STUDIES

This section first deals with the review of the studies dealing with the components of money supply; determinants and factors affecting money supply.

Determinants of Money Supply:

Seshadri and Prasad\(^{36}\) in their analysis of bank deposits in India, has found a structural shift in the composition of financial assets and also in the composition of money supply.

Their study revealed that expansion of branches of banks in rural and hitherto unbanked areas, the deposit rates of banks, changes in the price level, and the volume of agricultural production were the factors responsible for variation in the ratio of currency to bank deposits (C/D) since sixties. Thus these factors are influencing changes in the supply of currency as well as bank deposits since sixties.

Menon\(^{37}\) studied the relationship between reserve money and money-stock during the period from 1960-61 and 1987-88. He divided the entire period into four sub-

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periods and analysed the trend in monetary aggregates. The study revealed that average growth of reserve money per annum rapidly increased from one sub-period to another with respect to $M_1$ and $M_3$ since 1971. The currency component of reserve money declined continuously. This implied that the share of bank reserves increased over the period but more rapidly since 1971.

Menon's study showed that factors such as the required reserve ratio, excess reserve ratio and black market activity were affecting the supply of currency over the period from 1960-61 and 1987-88. Again he found that the required CRR, black market activities and spread of banking facilities in rural areas were the major factors affecting the supply of credit money over the period.

An analysis of sources of change in money supply ($M_1$ and $M_3$) following the money multiplier approach revealed the diminishing role of money multiplier to induce monetary expansion. The contribution of reserve money to change in money stock $M_1$ and $M_3$ had been significantly large.

Kharadia\textsuperscript{38} analysed the trend in the currency to demand deposits ratio covering the period from 1901 to 1980 with the help of regression technique. The empirical

results showed that the currency to demand deposit ratio (C-DD ratio) was declining continuously. It declined by 56 per cent during 1901 to 1950, by 60 per cent during 1951 to 1980 and by 79 per cent during the period 1961 to 1980. The secular trend in the C-DD ratio during the period from 1961 to 1980 implied that the composition of money supply altered to include more and more bank deposits with given levels of bank reserves over the period.

Kharadia obtained the result that the income level and monetization of the economy were the most significant factors influencing the supply of currency during the period from 1901 to 1980. Again he showed that relative opportunity costs of holding demand deposits, changing payments habits, considerations of convenience, the degree of sophistication in financial behaviour, the nature of financial structure, the degree of financial deepening also influenced the supply of currency during the period 1901 to 1980.

Rangarajan and Sing39 examined the relationship between growth of money supply and growth of high powered money, using regression tool, for the period from 1974-75 to 1981-82 and found that between M₁ and M₃, growth in M₁

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was more closely associated with growth in high-powered money.

According to their study the incremental cash reserve ratio, institutional factors such as expansion of banking facilities, extension of bank branches to rural areas and demand factor such as interest rates on bank deposits were affecting the supply of currency since seventies. All these factors were also influencing the supply of credit money since seventies.

Singh, Shetty and Venketachalam estimated the double log money supply function for the period 1970-71 to 1980-81 and found that the currency component of money supply declined over the period in relation to bank deposits. Thus, total bank deposits component of money supply had increased during 1970-71 to 1980-81. They also found that factors such as interest rates on deposits, expansion and extension of banking facilities were affecting the ratio of currency to bank deposits and hence influencing the supply of both currency and credit money since seventies.

Kulkarni and Miller\textsuperscript{41} tested the usefulness of the money-multiplier model as a basis for monetary policy, in the short run. The study used regression technique on the data for 1950-1979. The empirical results showed that the money multiplier ($m$) with respect to narrowly defined money supply- $M_1$ and $M_3$—broadly defined money supply $M_3$ were unstable.

In the constant growth rate model, they found the growth of base-money $H'$ accounted for 92 per cent and 77 per cent of the growth in $M_1$ and $M_3$ respectively. On the other hand in the accelerating growth rate models, the acceleration in the base-money growth accounted for 81 per cent in $M_1$ and 79 per cent in $M_3$.

Their empirical results also showed that structural and institutional factors such as shift from the unorganised to organised money and capital markets, expansion of banking facilities, extension of branches of banks to rural areas, availability of close substitutes of money were affecting supply of credit money since seventies.

According to this study the net RBI credit to Government was the most important factor in explaining

variations in supply of currency over the period from 1950 to 1979.

Vasudevan's empirical results showed that net RBI credit to Government and net foreign exchange assets were the only significant factors responsible for change in high-powered money over the period from 1950-51 to 1979-80. Thus these two factors affected the money supply through changes in high powered money.

Vasudevan examined the behaviour of four variants of high-powered money 'H' over the period from 1970-71 to 1979-80. First it was the official version of HM called $HM_{v1} = Cp + BR + ODs$, where $Cp$ is currency with the public, $BR$ is bank reserves consisting of vault cash with banks and bankers deposits with RBI and $ODs$ is other deposits with RBI. Second, $HM_{v2} = Cp + BR$. Here OD is excluded. The third variant was the adjusted HM (i.e.), $HM_{v3} = Cp + BR - ER$, where $ER$ is excess reserves of banks with the RBI. The fourth variant was $HM_{v4} = Cp + BR - ER - RBIc$, where $RBIc$ is RBI's claim on banks. From the data he found that $HM_{v1}$ was largest in amount among the four


variants. Variants 1 and 2 increased at annual compound rates of 14.3 per cent and 14.2 per cent respectively during the seventies. Variants 3 and 4 recorded annual compound growth rates of 14.0 per cent and 14.7 per cent respectively during the same period. Variants 3 and 4 showed smaller co-efficients of variations than the variants 1 and 2. Variant 3 was most stable among the four variants.

Gupta\textsuperscript{44} examined the supply of money in India by using the annual data for the time period 1950-51 and 1975-76. His best fitting regression equation for money supply MS was:

\[ MS = -11.6 - 1568.7Z + 0.993 \, H^* + 0.616 \, ZH^* + 114.88r \text{ adv} \]

\[ \text{t-values: } (-0.08) \quad (-10.05) \quad (10.65) \quad (7.49) \quad (4.64) \]

\[ R^2 = 0.999; \, d = 1.81 \]

where MS was the supply of money, $H^*$ was the adjusted high powered money and $r \text{ adv}$ was the weighted average of advance rates at which commercial banks made loans and advances. Z was a dummy variable, taking the value of 1 for 1962-63 and every following year and the value of zero for every year preceding it. $ZH^*$ was the slope of the dummy variable. The t-values of all the estimated co-efficients (except for the constant term) were

statistically significant and the independent variables in the equation explained 99.9 percent of the observed variation in MS.

The results showed that there occurred a structural shift in the relation between M and H*. The study revealed that the currency to demand deposit ratio was increasing during the period from 1951-52 to 1961-62 and declined sharply thereafter, particularly after 1970-71.

This implied that the share of demand deposits in money supply had increased rapidly as compared with the share of currency, since the seventies. The study also showed that the time deposits to demand deposits ratio was showing an upward trend over the period, particularly after 1970-71. This implied that the time deposit component of money supply had increased rapidly relative to the demand deposits component since the seventies. The result of the study also showed that the ratio of bank reserves to total bank deposits was stable since 1962-63 and the ratio of liabilities of non-bank financial intermediaries to total bank deposits was highly stable over the period. This implied that the share of bank reserves in money supply remained unchanged since the sixties, and the share of liabilities of non-bank financial intermediaries in money supply also remained unchanged over the period. His observation was
that the advance rate of banks and the rate of interest on 12 months time deposits of scheduled commercial banks were the factors affecting the supply of currency and bank deposits since the seventies.

Swamy examined the behaviour of the proximate determinants of money multiplier, using regression technique. The study revealed that the ratio of currency to demand deposits was increasing during the period from 1951-52 to 1961-62 and was declining sharply thereafter, while the ratio of time deposits to demand deposits was increasing continuously since 1961-62. Further, the ratio of reserves to total bank deposits and the ratio of non-bank liabilities to total bank deposits were highly stable over the period. The share of currency component in the money supply was high in the fifties and thereafter declined as compared with demand deposits. The study also found that the share of time deposits in money supply was increasing since the sixties as compared with that of the demand deposits. This showed that the share of credit money was increasing compared to the share of currency since 1961-62.

Swamy’s empirical results showed that black money, spread of banking facilities in rural areas, short-term

interest rates, rate of interest on 12-month time deposits, stability of the banking system, advance rate of banks were influencing supply of both currency and credit money since the sixties.

Majmudar et.al.⁴⁶, found that growth of population, increasing monetization and banking habits were important factors determining the supply of currency from 1951-52 to 1978-79. But these factors were not significantly affecting the supply of currency during two sub-periods, i.e. 1963-64 to 1978-79 and from 1968-69 to 1978-79. On the other hand, they showed that the rate of interest on deposits having maturity period of one year, national income, the share of non-agricultural income to total income, expansion of branches of commercial banks and the rate of interest on 12-month time deposits were the major variables explaining variations of the supply of credit money over the period, especially since the beginning of the second sub-period.

The market borrowings of the Government, deficit financing, foreign exchange assets and the incremental cash reserve ratio were found by Bhole⁴⁷ to influence the

supply of currency. The availability of large number of near-money assets (i.e. financial deepening), extension of banking facilities to rural and semi-urban areas, the cash reserve ratio and the short term rate of interest influenced changes in the supply of credit money over the period from 1950-51 to 1981-82.

Jani\textsuperscript{48} showed that the long term deposit rates and growth of banking system were the major determinants of the supply of credit money during the period from 1950 to 1986.

Jadhav\textsuperscript{49} showed that the call money rates, the time deposit rate, and expansion and extension of banking facilities were the major factors bringing about changes in the supply of both currency and credit money over the period from 1979-80 to 1986-87.

Majumdar\textsuperscript{50} studied the impact of food procurement operations in the supply of legal tender money and found it to be significant. He also found that net off-take of


foodgrains from the public sector stocks, import of certain goods like food articles including edible oil, fertilizers and fuel, flow of cash between the formal and informal sectors of the economy, dishoarding and hoarding of cash and monetisation of the economy were significant factors responsible for variations in the supply of currency over the period from 1968-69 to 1987-88. Again, he showed that crop loans to agricultural sector, term loans to industrial sectors, extension of banking facilities to rural areas, and expansion of branch offices of banks also affected the supply of credit money over the period.

Majumdar\textsuperscript{51} found that the financial deepening, expansion of branches of banks, extension of banking facilities to semi-urban and rural areas, and interest rates on deposits would explain variations in the supply of credit money over the period from 1970-71 to 1988-89.

According to Trivedi\textsuperscript{52}, the net RBI credit to Government and the required cash reserve ratio were important determinants of the supply of currency over the period from 1960-61 to 1988-89. Also interest rates on deposits, the spread of banking facilities to semi-urban


and rural areas had their influence on the supply of credit money since seventies. According to this study High powered money emerged as an important determinant of $M_3$. Coats and Khatkhate\textsuperscript{53} observed that money supply and money demand functions were not basically different in less developed countries. But, in certain respects, they were influenced by the political, institutional and economic factors; unique to each country. In less developed countries, base money was the major determinant of the money stock and the deficit financing of the government expenditure, which often tantamounted to the creation of Central bank credit, was a principal factor affecting base money. Because of this, there was considerable overlapping of the monetary and fiscal policies.

Mody and Thaker\textsuperscript{54} in their article discussed a behavioural theory of money supply. They derived the money multiplier by using portfolio approach from the equation of sources and uses of high powered money. The main source of change in high-powered money was the variations in the assets of the Reserve Bank of India


like its claims against government, commercial and co-operative banks, commercial sector, etc. Moreover, foreign exchange assets held by the Reserve Bank, i.e. claims against other countries also constituted a source of variation in supply of high powered money.

Rani and Ramachandran\textsuperscript{55} analysed different money stock measures and focussed their attention to the twin aspects of controllability and predictability of Money supply in the money multiplier framework. The study revealed that none of the four money stock measures had any predictable relationship with base money. They used the recursive residuals stability test. The overall findings of the study did not support the underlying assumptions of multiplier theory of money supply.

\textbf{Theory of Money Supply}

With the emergence of Keynesian General Theory, macro economic thinking developed. It also facilitated monetary theory in a big way. Though extensive surveys are available, a brief sketch of evolution of monetary theory serves the purpose of better understanding of the significance of the concept of money and its role in the present day system.

The Classical tradition treated "money as veil" determining the nominal values of macro economic aggregates, particularly output. Yet, it could not stretch further and discuss its effect on the real economic activity, which was determined by real factors like capital stock, productivity, technology and the like. Hence, money was assigned a passive role as a reflector of economic activity rather than its active regulatory role.

The Classical theory of money is stated precisely by the quantity theory of money:

\[ MV = PY \]

where

- \( M \) = Stock of money
- \( V \) = Income velocity of money
- \( P \) = General Price Level
- \( Y \) = Aggregate output.

Though Fischer's original formulation used "T" to denote all monetary transactions, it was useful to discuss it with "Y" involving only currently produced final goods and services. This was an identity, but the assumptions were important. Output was assumed to be at full employment level and determined by non-monetary factors.

58. Joan Robinson, Selected Economic Writings, (Bombay : Oxford University Press, 1976) P.1
Money stock was influenced by policy makers and velocity of money by payment habits of people. Thus V and Y were exogenous. Given their values in the short run, the general price level would vary proportionately with money stock, (i.e.) a five per cent increase in money stock would lead exactly to five per cent increase in the price level. It was also important to note that the Classical doctrine considered interest rate as a non-monetary phenomenon. Thus, it was "an attempt to apply the supply-and-demand tool to the analysis of the purchasing power of money. The entity with which this analysis was mainly concerned was therefore, the price level. It was admitted that the chief justification for a study of the price level was in the fact that it might affect volume of output, employment and wealth of the community. But the Classical tradition put forth the identity as a tautology devoid of causal significance. The predictive abilities of such a theory was questioned by the critics.

According to Kurihara59, "it was not a description of an actual process of adjustment, the identity equation was a tool for 'static' analysis. A failure to describe an actual 'dynamic' process of adjustment between conflicting decisions to save and to invest was the main analytical handicap of identity equation, and also the main reason for the need of a dynamic approach".

Keynes in his 'Treatise on Money'\textsuperscript{60}, tried to discuss in detail both demand for and supply of money. He brought in the savings - investment balance. The concept of liquidity preference and role of interest rate, suggested a money market, that set interest rate at the equilibrium level of demand for and supply of money. Interest rate related the money market to product market and a comprehensive description of the process of macro economic equilibrium was available, wherein money supply, output, interest rate and prices were all interacting to determine the equilibrium.

The Keynesian view of macro economics led to the 'neo-classical synthesis', which is however dubbed as schizophrenic in character, subscribing to both the Keynesian as well as Classical doctrines\textsuperscript{61}, without any basic explanation for the perceived relationship. The neo-Keynesians attempted to correct this character by providing micro economic foundations to Keynesian macro relationships. Tobin's work on 'portfolio analysis', Modigliani's work on 'life cycle theory of consumption and Jorgenson’s work on 'investment function' were some prime examples. Through their work, they tried to demonstrate that the Keynesian macro relationships were consistent with optimisation of goals by individual economic agents.

The neo-Keynesians' hegemony was shattered by a chain of events in the early 1970s, breakdown of the fixed exchange rate system, the OPEC oil shock and bad harvests led to high inflation and high unemployment. Hence, Keynesians were unable to explain 'stagflation'. Professional response to these events led to a significant polarisation in favour of monetarism.

Nevertheless, the question of an appropriate money stock measure arose initially out of the basic difference implicit in the two approaches of 'the Quantity theorists' and 'the Keynesians'. This distinction attributed to the characteristics of money, i.e., the conception of money as a 'medium of exchange' or as a 'store of value'. The general recognition of the store of value function of money had given rise to the fairly widely accepted phenomenon of substitutability between money, traditionally defined as medium of exchange and the whole spectrum of other financial assets obtaining in an economy. Therefore, the fundamental aspect of the Keynesian formulation was of the demand for money inter alia as an asset alternative to other financial assets. Such a demand was considered to be sensitive to interest rates. Crowther remarked: "the Quantity Theory of Money explained as it were, the average level of the sea; the

Savings and Investment theory explained the violence of the tides. The policy implications and significance of the income theory were different from those of the traditional Quantity Theory of Money. While the income theory gave importance to fiscal policy of taxation, public expenditure and public debt management, the latter gave importance to monetary policy.

Very recently, Friedman challenged Keynesians and attempted to rehabilitate the traditional Quantity Theory of Money. He was considered an eloquent champion of monetarism. And the events of early 1970's brought forth monetarism as a paradigm to reckon with.

According to monetarists, there was a direct and reliable link between the money supply and GNP. That link was the predictability of monetary velocity. With this restatement of the Quantity Theory, Friedman tried to explain demand for money as influenced by the same factors that influenced demand for any asset. Demand for money was a positive function of the resources available to individuals, i.e. permanent income as measured by the present discounted value of all expected future income. The opportunity cost of holding money was a negative function, as represented by the expected returns on other

assets relative to the expected return on money holdings. The expected rate of inflation was used by Friedman as a proxy for the rate of return on goods\(^\text{66}\). These were two vital areas of differences between (Monetarist) Friedman and Keynes. First, interest rates were an important determinant of demand for money in Keynes's. Friedman's theory claimed that changes in interest rates had little effect on demand for money. Second, demand function for money was unstable according to Keynes, whereas Friedman stressed that the money demand function did not undergo pronounced shifts, hence it was stable.

The monetarists strongly believed and claimed that quantity of money was the prime determinant of the level of prices and economic activity. Excessive monetary growth was responsible for economic fluctuation. The debate between monetarists and Neo-Keynesians had major implications. Neo-Keynesians accepted that their earlier position that money did not matter at all was not correct. Monetarists, on the other hand, went to the extent of suggesting that inflation was always and everywhere a monetary phenomenon. Present day monetarists and Neo-Keynesians would agree that monetary policy actions would have a substantial effect on output and prices. Since money had the dominant influence on nominal income and in the short run on output as well,

stabilising the money growth rate would help eliminate the major source of instability in income determination.

In the case of developing countries, structural factors such as sectoral interdependence, dependence on foreign trade for critical inputs like oil and the like had added new line of thinking. The advocates of this school were called Structuralists. They argued that inflation was not a monetary phenomenon, it was the result of structural disequilibrium in the growth process which could not be cured by only monetary regulation. Inflation might occur without any expansion of money supply. In modified Structuralists' models, money supply expanded along with price level, but the direction of causality was not necessarily from money to price; it could be the other way. There was a trade-off between growth and inflation. It was due to differential growth of output and demand between sectors.

**Macro Relationships**

Sarma\(^67\) studied the relationship between inflation, money supply and Government deficit. He observed that increased fiscal deficit, which is largely financed by the central bank, increased money supply. This monetary expansion, in turn, leads to a further increase in

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price level and the process is self-generating. From 1961-62 to 1979-80, large budgetary deficits of the government were mainly financed by the borrowings from the Reserve Bank. The widening budgetary gap was mainly due to the government’s desire to keep the real expenditure at the planned level and lags in revenue collection.

The Chakravarty Committee on the working of the monetary system in India suggested that the Government borrowings from the Reserve Bank of India should be curtailed substantially, first by raising the interest/discount rates on the borrowings made by the Government, Second by keeping the amount of Government borrowing during each financial year within the pre-determined limits. Dandekar68 analysed the suggestions in detail and subscribed to the second viewpoint of the committee, but disagreed with the first. Instead, he suggested that credit to government should be made at a subsidised rate and laid emphasis on government borrowing through Statutory Liquidity Ratio and raising the funds through the market by issuing price indexed bonds.

Bourne\textsuperscript{69} analysed the influence of monetary and credit variables on the price level and balance of payments, to show the importance of monetary policy in attaining the objective of internal price stability and balance of payment equilibrium. He concluded that if the nominal money stock increased faster than warranted by real economic growth, then the domestic price level would rise and the balance of payment would deteriorate.

Rangarajan and Arif\textsuperscript{70} in their econometric model of Indian economy brought out the interrelationship between money, output and prices. According to them, the stock of money varied endogenously through the feedback from reserve money, which had changed to accommodate fiscal deficit. The price level was determined by money supply and output. The government budget was affected by price level and output. The output was influenced by change in real money supply acting as proxy for real credit. The model observed an immediate impact of monetary expansion on price level so a sustained monetary expansion was not found to be a viable policy tool since the inflationary spiral weakened the real output in the long run.


Singh and Adhikary\textsuperscript{71} studied the relationship between budget deficit, money supply and prices using a small econometric model. The results showed that the stock of broad money was determined by budget deficit, bank credit to commercial sector and level of foreign exchange assets. Given the stock of broad money, output of the manufacturing sector, the price level of foodgrains and non-foodgrains and tax rate, the overall price were determined. This price level affected government's expenditure, revenue receipts as well as output. These feedback effects were again transmitted through the budget deficit to the monetary sector and prices thereafter. The budget deficit had a significant impact on the expansion of monetary stock. More specifically 70 per cent of expansion in money stock was due to budget deficit, while 30 per cent was due to the bank credit to the commercial sector.

Chandrasekhar\textsuperscript{72} studied the relationship among growth rates in national income, money supply ($M_1$) and consumer prices since the early 1950's with the objective of understanding the role of monetary policy in balancing price rise and production. He observed that when money supply grew faster than national income, then consumer

\textsuperscript{71} Balwant Singh and Adhikary S.K., "Budget deficit, Money supply and prices - an explanatory model", MARGIN 23(1) : 35-48, 1990.

prices increased. So also, a slow down in money supply accompanied by rising production was found to depress consumer prices.

Sharma\textsuperscript{73} studied the causality between money and price level. He used Sims methodology and found that the causality was ambiguous. He re-examined the causality by using Granger test. His study revealed that in Indian economy, there was a unidirectional causality running from both narrow money ($M_1$) and broad money ($M_3$) to price level. The study also found that the flexible exchange rate period provided a better estimate of causality than the fixed exchange rate period.

Sarma\textsuperscript{74} studied the relationship between money, output and prices in India with the help of an empirical price equation. His study covered the period from 1971-72 to 1989-90. The wholesale price index was the dependent variable and output measured in GDP in real terms and money supply ($M_3$) were the explanatory variable. Through partial adjustment mechanism, he specified the equations indouble logarithmatic form. The lagged price variables indicated the influence of past values of output and money supply on the current period price level. The

\textsuperscript{73.} Ram Lal Sharma, "Causality between Money and Price level in India revisited", \textit{Artha Vijnana}, 23(2) : 126-141, 1991.
various tests conducted on the price equation showed that the behaviour of prices was well explained by changes in output and M₃. The distributed lag effects on prices of a one percentage once for all change in M₃, holding output constant were significant for about three years following the change and peter out progressively in the subsequent year.

Thacker⁷⁵ used statistical theory of integrated regressors to establish the time series properties, viz., non-stationarity and cointegrability of M₁, M₃ and CPI and WPI economic series for India and used these empirical properties of the data to specify and test Granger Causality between the different series. The results indicated that monetary growth caused inflation. There was unidirectional causality from M₁ to CPI and M₂ to CPI, however, there was bidirectional causality from M₃ to WPI and M₃ to WPI.

Das⁷⁶ explained the behaviour of money supply, Government expenditure, output and prices and their simultaneous impact on the inflationary expectations. The study aimed of estimating the influential variables viz., the expansion of money supply and consequent

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increase in general price level, the formation of excess demand and the extent of its impact on the price level; the interaction between money supply, income and the price level; and the simultaneous impact of money supply, money income, government expenditure on inflationary expectations in inhibiting future rise in prices. The results showed that the money supply and price level were closely and significantly related. The lagged variables explained better than current variables. This meant that the movement of monetary base dominated the movements of money supply and consequently of the price level; the influence of current income on price level was stronger as compared to price level with one year lag and income at constant prices; the trends in money supply, government expenditure, real income and acceleration coefficient supported positive evidence in favour of strong inflationary expectations dominantly influencing the price level.

Mohanty and Ranjan77 studied the inflationary process in Asian Clearing Union countries during the period 1970 to 1990; the study was an attempt to identify the influence of both monetary and structural factors on price level. The study revealed that apart from money supply, structural factors such as agricultural output, import

77. Deepak Mohanty and Rajiv Ranjan, "Monetary Expansion and Inflation in Asian Clearing Union (ACU) countries", RBI Occasional Papers, 14(3) : 161-238.
prices and food prices had major influence on price. There was a negative correlation between growth and inflation, which warranted the responsibility of monetary policy to contain inflation, whenever fiscal actions or external shocks became destabilising.

Masih and Masih\textsuperscript{78} studied the causality between money and price in Indian context. According to the study, money supply was the leading variable and price was the lagging variable during the period 1960-1990.

Rangarajan\textsuperscript{79} in his presidential address at the Conference of the Indian Economic Association in 1988 discussed issues in monetary management. He said that the major objective of monetary policy was to ensure a reasonable degree of price stability for which control over money supply was necessary. The money supply could be controlled by having a close understanding between government and the Reserve Bank, since a major part of reserve money creation arose as a consequent of net RBI credit to government.


Again, there was a need for rationalising the administered structure of interest rates which over the years had become extremely complex. While it was possible to build into the interest rate structure, some element of cross subsidisation the administered structure of interest rates should not deviate too far from market expectations if funds had to stay within the organised financial structure.

He also pointed out the growing scope of monetary policy. Monetary policy should even extend to the development of appropriate financial institutions required for the growth of an economy especially in a developing economy. He referred to the need of rejuvenating the rural credit delivery system. He also emphasized the need for a closer co-ordination between monetary policy and exchange rate policy.

Varma and Kumar\textsuperscript{80} studied the causality between money supply and price level using Sims and Granger tests. According to them there was a feedback relationship between supply of money and level of prices. Because of this feedback relationship, the nominal stock of money could not be considered as exogenously determined. So stock of money became less effective as a control variable.

But the empirical study revealed that the estimated co-efficients of the lagged, current as well as future values of M₁ were not significant as a group, while those of P(Price) as a group were not significant. Further, the estimated co-efficients of the lagged, current and future values of M₃ as a group as well as those of its reverse were not significant. Hence the study concluded that there existed a unidirectional causality from M₁ to P and not from M₃ to P. The predictive power of the equation increased, when P was regressed on M₁ with eight past, current and future lags.

Mishkin⁸¹ in a symposium on the Monetary transmission mechanism raised a broad range of questions. He discussed the appropriate monetary policy in different business cycle episodes and wanted to find out an appropriate rule for monetary policy. He also discussed a possible trade-off between output variability and inflation variability.

Cover⁸² studied whether positive and negative money supply shocks had symmetric effect on output. The results showed that positive money supply shocks did have an

effect on output. The findings were independent of whether or not expected money was assumed to affect output.

Singh\textsuperscript{85} conducted an empirical investigation of money prices causality in India for a sample space of 38 years spanning from 1950-51 to 1987-88, using (a) Granger-Sargent, (b) Sims and (c) Geweke tests to analyse the dynamics of causal realtionship. All the three tests consistently indicated the existence of bi-directional causality between broad money supply ($M_3$) and prices (WPI). An increase in broad money supply lead to an increase in prices which in turn resulted in a rise in budget deficit and consequently money supply. The study revealed that such a bi-directional causality between broad money supply and prices indicated that both these variables could be jointly endogenous to the system.

Bernanke and Gertler\textsuperscript{84} studied the reaction of the economy to monetary policy shocks. A tight money policy lead to a sustained decline in the real GDP and the price level. Final demand absorbed the initial impact of money tightening, falling relatively quickly after a change in policy. Due to fall in demand, production would also

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\item \textsuperscript{84} Ben S. Bernanke and Mark Gertler, "Inside the Black Box : the credit channel of monetary policy transmission", Journal of Economic Perspective, 9(4) : 27-48, 1995.
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fall but only with a lag, implying that inventory stock would rise in the short run. Finally, GDP would decline due to disinvestment of inventory. The residential investment declined at the first instance of a tight money policy, followed by spending on consumer goods. Fixed business investment eventually declined in response to money tightening.

Meltzer\textsuperscript{85} studied the importance of Friedman's recommendations for public policy rules and pointed out that rules might be adaptive and not fixed. The rules would adjust in a predictable way to permanent changes in real growth situation. The five rules of monetarist propositions for which he was trying to establish support were:

1) Neither the central bank nor private forecasters can predict output, employment, inflation or other variables with sufficient accuracy to control fluctuations on average.

2) Lags are not constant, neither government nor private forecasters can distinguish between permanent and transitory disturbances to levels and growth rates, until sometime after they occur.

3) The response of particular relative prices to monetary and other impulses in any cycle may

differ from previous cycles depending on initial conditions, the nature of shocks and the policy rule that is followed.

4) The private sector damps fluctuations and return to stability if undisturbed by unanticipated policy impulses

5) Rules that are easily monitored reduce costs of information.

He found out that the required level of information for a successful discretionary policy - one that minimised the uncertainty that the public must bear - was simply not available. Even if such information were available, discretionary policy actions might change structural responses.

Salam\textsuperscript{86} provided an analytical framework relating trend in money supply, output and prices during the period from 1991-92 to 1994-95, to analyse the impact of economic reforms programme. The study revealed that supply of money ($M_1$) was found to behave highly erratic which showed the lack of control of the Reserve Bank of India over its behaviour. It was also seen that instability in the growth of output and monetary expansion lead to increase in price level. It was noticed in the study that the

increase in output was not accompanied by a fall in prices. But money supply had a significant and positive effect on prices. Efficient management of the supply of essential commodities, a reduction in fiscal deficit, and thereby, in the growth of money supply would check the pace of price rise.

Linda\textsuperscript{87} investigated the effects of monetary policy under the crawling peg in Colombia. It was found out that variations in domestic credit affected the balance of payments but not the exchange rate in Colombia. This suggested that the crawling peg had functioned more like a fixed than a flexible exchange rate, or that the authorities had targeted the exchange rate. Domestic credit had only a weak effect on national output. However, the total money supply (domestic credit and foreign exchange reserves) explained a much larger fraction of the variance in output. Also it was found that neither domestic credit nor the exchange rate played much of a role in explaining changes in inflation in Colombia. Other than its own past, the only variable with much effect on inflation was income. The positive sign on the impulse response function suggested that the linkage between income and inflation was due to demand shocks. Therefore, it was concluded that the inflation in Colombia

was the result of demand shocks and appeared to be primarily internal.

Coleman\textsuperscript{88} attempted to explain the correlation between money and output at various leads and lags with a model in which money was largely neutral and endogenously responded to output. He selected the parameters according to the simulated moments estimation technique. Through his analysis he was unable to match key patterns between money and output. Despite the failure of the model he explained that the endogenous determination of monetary aggregates indeed played a key role in the observed relationship among nominal and real variables. He concluded that both non-neutrality and endogenity of money were important determinants of the relationship between money and output.

Bhattacharya and Lodh\textsuperscript{89} made an analytical survey on inflation in India. They concluded that money supply was one of the important determinants of inflation rate. Among non-monetary factors, food supply and government buffer stock operation through public distribution system and import price were the major determinants of inflation rate. The relative disparity between


\textsuperscript{89} Bhattacharya, B.B and Madumita Lodh, "Inflation in India : an analytical survey", \textit{Artha Vijnana}, 32(1) : 25-68, 1996.
agricultural and non-agricultural income was another important factor behind inflation. They found that food and agricultural prices followed generally flexible market clearing behaviour whereas manufacturing prices followed generally cost-plus mechanism.

Mohanty et.al\(^9\) attempted to briefly capture the monetary developments with theoretical and empirical underpinnings of monetary policy in India during the past 50 years. The study delineated the evolution of the role of monetary policy from one of developmental in nature during 1950's and 1960's to that of neutralising huge liquidity generated in the economy consequent upon weakening of fiscal balance of the government during 1970's and 1980's. This was followed by institutional reforms during 1990's culminating in the supplemental agreement between the government of India and the Reserve Bank of India on March 26, 1997 to eliminate the practice of automatic monetisation of fiscal deficit. While analysing these developments, the study focussed on how the emphasis on various monetary policy instruments had evolved from essentially one of the direct and administered instruments to that of relatively indirect and market based instruments. The analysis of money, output and prices in a historical perspective showed

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that unbridled growth of money supply translated largely into rise in prices, underscoring the need for prudence in monetary management.

Rangarajan\textsuperscript{91} observed that critics who were sceptical of the relationship between prices and money pointed to the fact that there were many years in which there existed wide divergences between changes in prices on the one hand and changes in income and nominal money supply on the other. This was attributed to a failure of money supply to explain changes in prices. This was not a correct approach. The relationship between prices and income and money supply was found to hold reasonably well over a period of time. Averages of price change over a period of four to five years were predicted with reasonable accuracy by these equations and these predictions fell within a range which should be a sufficient guide to policy. Five year moving averages of actual and estimated price changes derived from a price equation corresponded closely. Upon extending the earlier equation to include more recent observation, he found that "the proposition still holds good..." All price increases in India over the last few decades could not be explained by a structural explanation or by supply shocks. Excess growth in money supply had played a role. Inflationary pressures were building up on a secular basis.

Another important variable is inflation. Higgins\textsuperscript{92} had observed that most underdeveloped countries had experienced inflation during recent decades. Violent inflation had taken place in some Latin American countries. In some cases, "the inflation seemed to have been justified as a lubricant to economic growth". In others it appears that rampant inflation had disrupted the economy and retarded economic development.

Johnson\textsuperscript{93} contended that as long as inflation proceeded at a rate low enough not to disturb seriously the general confidence in the stability of the value of money, it would ensure redistribution of income. But if people came to expect inflation and sought to protect themselves by holding goods instead of money, misallocations of resources would take place. With the various rigidities and immobilities characteristic of any economy, particularly of underdeveloped economies, upward movements of wages and prices would reallocate labour and resources and would help draw labour out of traditional or subsistence sectors into the developing sectors of the economy.


\textsuperscript{93} Harry G. Johnson as quoted in Gerald M. Meier, \textit{Leading Issues in Economic Development}, (Delhi : Oxford University Press, 1989), PP.194-198.
Machulp\textsuperscript{94} had outlined the model sequences of inflation as follows:

A) Demand - pull inflation: Autonomous expansion of demand would be followed by responsive and competitive price and wage increases.

B) Cost - push inflation: Aggressive increases of wage rates and / or material prices would be followed by induced and / or supportive demand expressions. This might further be divided into:

i) Pure wage - push inflation: Aggressive increases of wage rates would be followed by induced and / or supportive demand expansions and by responsive increases of other material prices and wage rates.

ii) Pure price - push inflation: Aggressive increases in the prices of materials would be followed by induced and / or supportive demand expansions and by responsive increases of other material prices and wage rates.

Santomers and Seater\textsuperscript{95} explained that inflation varied with the level of aggregate demand, excess activity or deviation of output from its trend level - a proxy for

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the former. They also showed that inflationary expectation also would push up inflation.

Laidler\textsuperscript{96} pointed out that if output and sales for the economy as a whole exceeded the 'natural level' there would be a preponderance of firms wishing to contract, so that the actual price level would be set above the 'expected price level' and vice versa.

Bhalla\textsuperscript{97} argued against the application of real activity model of inflation based on the Phillips curve, as an explanation of inflation to the developing countries. In the agricultural oriented economies, where output was determined by the supply side factors like weather and natural factors, total output and price level would be negatively correlated. In such a condition the proportion of food prices in general price level index should be positively related to inflation.

Saini\textsuperscript{98} studied six Asian countries including India and found that import price was a significant variable in


explaining inflation. He concluded that excess money supply did not have a significant effect on inflation rates and much of the inflation in the Asian countries was imported.

Krause and Salant\textsuperscript{99} identified four channels through which inflation was transmitted internationally, (i) external demand operating through the trade account, would bid up the prices of domestic goods (assuming either that there was full employment or that the elasticity of supply of exportable goods was low), (ii) external prices, that would bring the prices of domestic goods in line with those of traded goods, (iii) excess liquidity created by increased external reserves which encouraged spending on goods for which prices would rise until the equilibrium level of real balances was reached, and (iv) indirect stimuli such as international trade union activity, wage boosts and social gains elsewhere, and international inflationary expectations.

Barro\textsuperscript{100} analysed the effects of changes in the money supply on output. He studied the money supply process with the help of regression technique including growth


rate of the money supply, unemployment rate and real federal expenditure as the variables.

Mishkin\textsuperscript{101} drew a distinction between unexpected and expected changes in money supply and studied their effect on output using four lags of money supply growth rate, four lags of the first difference of the treasury-bill rate, and four lags of the federal government's budget surplus. He concluded that anticipated changes in money growth could be used to explain the relationship with output and employment.

**Inflation Control**

The Report of the Committee to review the working of the Monetary system was re-examined by Chakravarty\textsuperscript{102}. He observed that the committee had explicitly taken into account the expected inflation rate to recommend interest rates. By its very nature, he argued, that the expected inflation rate was not amenable to statistical computations based on historical levels of inflation rates. He concluded that the actual and expected rates would show a declining trend facilitating a reduction in nominal interest rates, when inflationary pressures were reduced.

Bhattacharya and Lodh\textsuperscript{103} made an analytical survey of inflation in India in the post-Independence period. The relative average annual growth rates of wholesale price index, consumer price index for urban industrial workers and implicit price deflator were worked out and analysed. Comparing the rate of inflation in India with that of other developing countries, it was found out that inflation in India was mild. The study could not establish a systematic relationship between annual inflation rate and annual excess money growth rate. It was also conjectured through the study that mild inflation was conducive to growth.

Empirical evidences on inflation in India suggested that money supply was only one of the important determinants of inflation rate. The pure monetarist model, therefore could not explain behaviour of inflation in India. The neutrality of money with respect to output and employment, which was the basic assumption of monetarist model was not found to be valid in India. Among non-monetary factors, food supply, government buffer stock operation and import price of foodgrains were found to be the major determinants of inflation rate.

Colander$^{104}$ observed that inflation was a real phenomenon and a monetary phenomenon. He made a distinction between real theory and monetary theory wherein he stated that the real theory looked inside the monetary black-box (components of money supply) and highlighted the real world mechanisms through which money and inflation were related. The central point of the real theory of inflation was that when one specified the path through which monetary policy controlled the price level, the unit of account function of money made nominal price setting decisions of individuals important. The nominal price setting decisions of individuals change the nature of aggregate equilibrium of a monetary economy from what would obtain from a non-monetary economy. Incentive anti-inflation plans such as MAP (Market anti-inflation Plans) directly off-set any upward pressure and thereby changed the attainable equilibrium. He has also doubted the political feasibility of MAP or some other alternative anti-inflation plan in India.

Mohanty and Ranjan$^{105}$ attempted a study of inflation in India and compared it with other countries in the Asian Clearing Union (ACU). During the 21 years period

from 1971-72 to 1991-92, the average annual growth rate of 'Broad Money' (M₃) showed a decline from 18.1 per cent in the seventies to 17.6 per cent in the eighties. It showed that the GNP showed an accompanying improvement in real GNP from 2.8 per cent per annum during the seventies to 5.4 per cent per annum during the eighties. The inflation rate also dropped from 9.4 per cent in the seventies to 8 per cent in the eighties.

Nag and Samanta¹⁰⁶ pointed out that structural constraints played a major role in the movement of general price level in developing countries like India. The inflationary dynamics would not be explained purely as a monetary phenomenon. Even aggregate analysis, taking demand and supply factors along with monetary variables was found to be empirically unsatisfactory, as quantifying the impact of any one variable on sectoral prices was not easy. Hence, they attempted a disaggregative analysis by considering the structural variables first and then analysing the influence of monetary aggregates on sectoral prices taking into account the time series properties of price indices and specifying the sectoral price equations. A detailed analysis of the monthly data on Wholesale Price Index and its components confirmed the view that, even in the Indian context characterised by substantial

Structural rigidities, monetary factors had a contributory role in generating overall inflationary pressure. The prices of foodgrains rose much faster than the prices of agricultural inputs (as the prices of agricultural inputs were mostly under administrative control). The rise in prices of other manufactured goods was not due to increase in price of raw materials, but reflected the demand pressure. The non-food credit was found to be an important factor in determining sectoral prices. The role of RBI to play an important role in moderating the pressure is highlighted.

Sau\textsuperscript{107} described a new type of inflation, unheard of by the monetarist and structuralists alike. This inflation emanated from the wealth effect of the stock market. He also pointed out that there was a general misconception about subsidy and its magnitude. He opined that estimate of subsidy as 15 per cent of GDP was false. The study pointed out that fiscal deficit was the root cause of inflation and balance of payment deficit. The 'New Economic Policy' opened up fresh avenues of making quick money by the affluent middle class and the top-rich and paved the way for another channel of inflation.

Causes of Inflation

Barman et al.,\textsuperscript{108} attempted to provide an advance estimate of inflation, using time series analysis spurred by the pioneering contribution of Box and Jenkins models to exploit the dynamic relationship in time series data to develop Stochastic models under different assumptions. The study used five other non-linear techniques, apart from Box - Jenkins models, viz., Bilinear, State Dependent, Random Coefficient, Autoregression, ARCH and Self Exciting Threshold Autoregression models (SETAR) to forecast the wholesale price indices 'for all commodities' and selected group of commodities. In general SETAR model performed well for most of the series of lead periods above three months. Box - Jenkins, Bilinear and State dependent models gave higher forecast accuracy for shorter lead periods upto 3-4 months. Bilinear model generated good forecasts even for higher lead periods. However, the authors pointed out that it was difficult to say that any single method performed uniformly better than others in all cases; a choice was not easy.

The RBI Report on Currency and Finance\textsuperscript{109} outlined the sources of inflation. The conventional as well as

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most widely held view about the proximate cause of inflation was a combination of demand pull factors, where large scale expenditures, often propelled by Governments and accommodated by monetary authorities augmented effective demand far in excess of supply. The second approach dealt with cost-push factors in which sudden increases in wages, interest payments and prices of raw materials and other inputs either individually or in combination jacked up prices. The third approach was the so called structuralist one wherein inflation was caused by structural rigidities such as stickiness in wages, prices and other bottlenecks prevailing in the economy. The sudden increase in oil prices, food prices or the policy shocks of the Government unanticipated by the households and firms were also outlined as some sources of inflation. While both demand pull and cost push inflation could be volatile and shortlived, the core inflation had a tendency to persist as it was strongly embedded in total inflation in the process of economy’s long term growth.

In the Indian context, there was no comprehensive study on the 'core' aspects of inflation. However, the report pointed out that the trend rate of inflation could be viewed as a surrogate for core inflation. The secular trend rate of inflation, on the basis of movement of wholesale prices of all commodities since early fifties was about 6.8 per cent per annum. When base year was
changed to sixties, the annual inflation rate turned out to be 8.2 per cent. For the period 1970-71 to 1994-95 the inflation rate worked out 8.9 per cent. The decadal average inflation rates in the seventies and eighties were nine per cent and eight per cent respectively. A steadily rising inflation during the more recent period was evident from the annual rate of inflation of 10.6 per cent during the first half of the nineties, the report further pointed out.

The EPW Research Foundation\textsuperscript{110} observed that the rise in prices of essential commodities affected the living standards of vast majority of people. Despite the claims of the Government to have brought the inflation under control, the study through an estimation of price index of both wholesale price and GDP deflator, tried to point out the myth of inflation control since it observed a phenomenal rise in prices of essential articles of mass consumption including foodgrains, pulses and vegetables.

Manjula\textsuperscript{111} described the theory of Lucas model, considered as a radical contribution to the theory of inflation and unemployment. Lucas theory strongly negated

\textsuperscript{110. EPW Research Foundation, "Myth of Inflation control - essential commodities worst affected", Economic and Political Weekly, 30(1) : 15-21, 1995.}
the effectiveness of macro-policy measures to cure the macro-economic problems of inflation, unemployment and poverty. The Theory of Lucas substantiated the arguments of Friedman and Phelps that the trade-off between inflation and unemployment was non-existent. The anticipated macro policy changes were neutral in their effect and only unanticipated or surprise policy changes had real effects.

Lal\textsuperscript{112} found that the rate of inflation since 1970's was well above 10 per cent due to rise in administered prices and indirect taxes, the upward revision in petroleum product prices and revision of the wages of organised labour. He concurred with the view that structuralist factors had caused this type of inflation.

Verma\textsuperscript{113} studied the sources of inflation and their impact on economic growth for the period 1963 to 1992. A rising inflation beyond a point could cause a problem to the process of economic growth. Hence, there was need to control inflation. On the basis of the analysis, the author emphatically argued that inflationary pressures out-classed the economic growth during 1980's and the Government was unable to control inflationary tendencies

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\textsuperscript{112} T.C. Mohanchander Lal, "Cost push theories of inflation and Indian economy", Monograph given to Academic Staff College, Bharathiar University, Coimbatore, P.9.1996.
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through fiscal and monetary measures. The need to control budget deficit, current account deficit and money supply was highlighted. The sub-period analysis showed that money supply and its growth contributed positively and significantly to this problem. The sub-period from 1979-80 to 1988-89 showed that the net bank credit to government, government currency liabilities to the public and net non-monetary liabilities increased at a faster rate. But the same sub-period analysis pointed out that the compound growth rate declined from 0.17 during (1969-70 to 1978-79 to 1979-80 to 1988-89) and further declined to 0.12 during the third sub-period (1989-90 to 1992-93). This was a welcome trend, opined the author, to curb inflationary pressures. Further the government consumption contributed to demand-pull inflation. The budget deficits in India had been financed with 'High Powered Money' which also contributed to inflationary pressures.

Mathai and Sriram114 cautioned that the surge of foreign fund inflows that was expected in the coming months after liberalization of the economy could upset the apple cart. The claim of the Government to have controlled inflation are short-lived. The authors further compared the standard inflation rates accepted

by the Indian Government around six to seven per cent while Governments of other countries like the US, U.K., and Japan attempted inflation at 2.2 per cent, 2.6 per cent and under two per cent respectively.

The Economic Times\textsuperscript{115} reported Rangarajan to have stated that the nominal interest rate could be achieved with the help of lower inflation rates. In his view, the real interest rate was not nominal interest rate less inflation. The real interest rate in the Indian context was the normal rate of inflation less the expected rate of inflation.

Bhalla\textsuperscript{116} argued that the monetary policy could be used for fine-tuning output and inflation trends, but seemingly it had not been done. Through study of constancy of growth of broad money ($M_3$) and other macro variables for coming to this conclusion, he pointed out that the Indian monetary world had been 'topsy turvy' and 'inconsequential' not because monetarism had little to offer, but because Indians had never followed monetarism in either its naive or sophisticated forms. The authorities used two separate instruments - money supply growth and interest rates.

\textsuperscript{115} The statement of C. Rangarajan, Governor, RBI, as reported in The Economic Times, DT. 04.10.1997.
Tarapore argued that the concept of inflation targeting was an idea whose time had come and it would be in the best interests of the country if the RBI were to formally ask for a medium term inflation mandate, approved by Parliament which would give RBI unfettered freedom to use all the 'weapons' in its armoury to attain the inflation target.

Indian experience was one of repeated and unproductive battles against inflation. It was, therefore, necessary to develop a band on the tolerable level of inflation and then rapid monetary policy action should be taken if the inflation rate strayed outside the mandated range.

It should be pointed out that price stability was not a doctrine for its own self. Inflation was a symptom of imbalance in the economy and the use of an inflationary target was essentially an attempt to use monetary policy to anticipate the emerging imbalance and to head it off before it became entrenched.

**Sum Up**

The focus of this study is on interrelationship between money, output and prices which continue to be an

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area of controversy and research. Above review of literature addresses to this problem and a few specific inferences are discernible, at least for the present day conditions of the Indian economy. They are stated below:

Monetary policy actions have a substantial effect on output and prices. Quantity theory of money of the classical and neo-classical economists is inadequate to explain macroeconomic relationships fully. Apart from supply of money, structural factors have significant influence on prices, particularly so in the development phase of Indian economy. Demand for money is reasonably stable and therefore control over money supply is necessary for price stability.

There is unidirectional causality from \( M_1 \) money to price but it is bidirectional between \( M_3 \) and \( P \). The distributed lag effect of \( M_3 \) is for three years. An increase in output causes a fall in price but an increase in \( M_3 \) causes the price to rise, the latter effect is much stronger than the former.

Thus money supply contributes positively and significantly to inflation. However, inflationary dynamics cannot be explained purely as a monetary mechanism. Feedback from economic growth must be recognised. A significant part of inflation, especially in the most
recent years (1990's) is imported. Budget deficit financed by high powered money has very much contributed to inflation. So the need for prudence in monetary management is not in doubt.

Economic growth in real terms has a check on inflation, thus having a twin effect on the levels of living of the people in the country: (i) one directly rising real income per capita and (ii) other in checking inflation and protecting real income. Growth must then be a legitimate goal of development planning.