5.1 Introduction:

The design and conduct of monetary policy has an important bearing on economic activity in aggregate. Since the economic activities are entangled with the fluctuations in most of developing economies especially that of India; the very and complete comprehension of their pros and cons assumes importance for both the policy makers and market participants. Thus the main objective of macroeconomic policy is based on the fact of avoiding the protracted recessions where the resources are left under utilised and the periods of unsustainable growth that can put the price stability in to peril. There is widespread agreement that monetary policy is being actively considered as an instrument of stabilisation, working through aggregate demand to smoothen oscillations of economic activity around the desired path.

The correlation between the Monetary policy and growth can be well examined through the transmission mechanism of monetary policy which shows in what way monetary policy affects the growth and inflation, which are the ultimate goals of monetary policy. The monetary policy action imparts to the ultimate objectives through two broad sets of channels-financial prices (e.g. interest rates exchange rates, yields asset prices, equity prices) and financial quantities (e.g. money supply, credit aggregates, supply of govt. bonds and foreign dominated assets etc).
CHAPTER-5 CORRELATION BETWEEN MONETARY POLICY AND ECONOMIC GROWTH: AN ANALYSIS

The purpose of this chapter is to examine and see the trends in the GDP of the country as well as the contributions from the different sectors. The plans wise study of the trends in GDP also makes the picture a crystal clear. Further, we have taken into account the concept of inflation – growth trade-off. In order to examine the impact of monetary policy on inflation and economic growth, the correlation coefficient has also been used in the study.

5.2 Trends in Growth during Plan Period:

It is generally agreed that the N. I. Trends, particularly trends in GDP, NNP and Sectoral distribution of gross or Net domestic product adequately reflect the progress of the country. Fortunately we have comparable data for a fairly long period spanning five decades, since the inception of economic planning.

Economic growth in India has been at modest rate of 4.35% per annum in five decades of the economic planning. Now we will see the real facets of economic growth in different five years or it is a high time to see and analyse the trends in economic growth in various plan periods.

The plans wise study regarding the trends of economic growth in India however does indicate an encouraging fact although the annual rate of increase in national income was partly low at 3.4 % per annum during the first three decades of economic planning. Later it has risen to
5.6 % during 1980-81. The table 5.1 (Fig.5.1) reflects the trends in economic growth during plan periods.

### TABLE 5.1

**GROWTH PERFORMANCE IN THE FIVE YEAR PLANS**

<table>
<thead>
<tr>
<th>Plans</th>
<th>Target</th>
<th>Actual</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Plan (1951-56)</td>
<td>2.1</td>
<td>3.6</td>
</tr>
<tr>
<td>Second Plan (1956-61)</td>
<td>4.5</td>
<td>4.1</td>
</tr>
<tr>
<td>Third Plan (1961-66)</td>
<td>5.6</td>
<td>2.5</td>
</tr>
<tr>
<td>Fourth Plan (1969-74)</td>
<td>5.7</td>
<td>3.3</td>
</tr>
<tr>
<td>Fifth Plan (1974-79)</td>
<td>4.4</td>
<td>4.9</td>
</tr>
<tr>
<td>Sixth Plan (1980-85)</td>
<td>5.2</td>
<td>5.4</td>
</tr>
<tr>
<td>Seventh Plan (1985-90)</td>
<td>5.0</td>
<td>5.8</td>
</tr>
<tr>
<td>Eight Plan (1992-97)</td>
<td>5.6</td>
<td>6.7</td>
</tr>
<tr>
<td>Ninth Plan (1997-2002)</td>
<td>6.5</td>
<td>5.5</td>
</tr>
<tr>
<td>Tenth Plan (2002-2007)</td>
<td>8.0</td>
<td>6.9*</td>
</tr>
<tr>
<td>From 1951-1980</td>
<td>-</td>
<td>3.5</td>
</tr>
<tr>
<td>From 1981-1999</td>
<td>-</td>
<td>5.6</td>
</tr>
<tr>
<td>From 1992-2005</td>
<td>-</td>
<td>5.8</td>
</tr>
</tbody>
</table>

*Growth rate in first three years of the tenth plan.

*Source: Planning Commission, Economic Survey 2005-06*

These are the final results that can be drawn from the table regarding the trends in economic growth in different plans.

During first five-year plan economic growth achieved a compound rate of 3.6% as a growth target of 2.1%. However, it has been at a very modest rate during this period.
Fig. 5.1
Growth performance in the five year plans

- First Plan (1951-56)
- Second Plan (1956-61)
- Third Plan (1961-66)
- Fourth Plan (1966-70)
- Fifth Plan (1970-74)
- Sixth Plan (1974-79)
- Seventh Plan (1979-84)
- Eighth Plan (1984-89)
- Ninth Plan (1989-94)
- Tenth Plan (1994-99)
- From 1992-2005
Second five year plan placed more emphasis on the industrialization in the country and it was anticipated that economic growth would increase at the rate of 4.5% per annum at constant prices. But it could not be realized and only 4.1% per annum growth rate has been achieved leaving a gap of 0.4% per annum below the target and the actual performance.

Third plan was comparatively a bigger plan from the point of view of investments and targets but growth during this period turned out to be only 2.5% per annum.

The fourth plan's strategy was to minimize the element of uncertainty, which had put the development efforts out of gear in the past. Even then the actual growth expenditure under the 4th plan was rather disappointing and the annual rate of increased in national income was only 3.3%. This clearly reflects that the economy continued to grow in fits and spurts.

The 5th plan contemplated an increase in GDP of order of 4.4% per annum. However, the actual performance was certainly impressive as compared to past experience as recorded a growth rate of 4.9%. 
5.2.1 Trends in Growth during 1980s:

The 6th plan period does not look at all satisfactory, as the national income rose in this period at a modest rate of 3.4% per annum only. Moreover the 6th plan contemplated 5.2% per annum increase in GDP and the actual growth happened to be 5.4% per annum due to the good agricultural performance and a rapid growth in service sector.

During the 7th plan period almost all major sectors registered satisfactory growth rates and the economy performed extremely well. The economic growth rose at an annual rate of 5.8% against the target of 5% leaving aside the agricultural sector. All other sectors such as manufacturing, transport, trade, hotels, commodity and personal services maintained a steady growth.

Thus, it has been noticed that there was acceleration of national income growth during the 1980s decade. The decade of 1980s is rightly characterized as the decade of economic buoyancy and recovery.

There are mainly three factors that allowed the economy to register higher growth in 1980s as compared to 1960s & 1970’s.

1. The increased government expenditure provided fiscal stimulus to the economy.
2. Liberalisation of imports, especially of capital goods and components of manufacturing induced production of luxury articles.
3. There was an increased reliance on external commercial borrowing by the state in order to finance increased fiscal and current account deficits.

5.2.2 Economic Growth After 1990s:

Advocates of economic reform have repeatedly claimed that the decade of 1990s has witnessed India's transition to a new higher growth trajectory. During the 8th plan, growth performance of the economy was 6.77 per annum, which is quite encouraging.

However, the average annual rate of increase in national income during 9th plan (1997-2002) is estimated at 5.5% which is significantly lower than the growth rate achieved during 8th plan. The actual growth rate during the 9th plan is also lower than the plan target of 6.5% per annum.

This lacklustre performance of the economy during the 9th plan period has been largely due to the failure of the industrial sector as it grew at only 4.7% per annum while services sector registered a growth of 8.1% per annum. However in India, high growth in services during the 9th plan failed to generate high overall growth.

The 10th plan witnessed favourable conditions regarding the growth performance of the economy and during the first 3 years of the tenth plan, overall rate of increase in national income has been 6-9% per annum led by a sharp accelerated in growth of manufacturing output. India posted real GDP growth of 8.1% in the second quarter of
2005. Manufacturing output which accounts for 20% of India's GDP surged by 11.3% during the second quarter in past supported by unexpectedly robust growth in exports.

The performance of Indian economy in 2004-05 has generated considerable optimism about medium term macro-economic prospects. It is heartening to note that in spite of the sharp slow down in agriculture the overall growth of GDP in 2004-05 was higher than the average growth attained over the preceding 12 years period began in 1992-93.

For third successive year the Indian economy has registered a highly impressive growth during fiscal year 2005-06. After recording some slow down in the third quarter (October-December) of 2005-06, real GDP registered a sharp increase in the fourth quarter (January-March) of 2005-06 benefiting from a pick up in almost all segments of agriculture, industry and services. According to the revised estimates released by CSO in May 2006, real GDP accelerated from 7.5% in 2004-05 to 8.4% during 2005-06. The Indian economy has, thus recorded an average growth of over 8% in latest three years (2003-04-05-06).

The Indian economy continued to exhibit strong growth during the first quarter of 2006-07. According to CSO, real gross domestic product (GDP) registered an increase of 8.9% in the first quarter (April-June) of 2006-07 as compared to 8.5% in corresponding period of 2005-06.
The stylised facts indicate that the structural acceleration of growth that is underway is based on solid foundations including a weatherproofing of the economy. These factors are equipping India to remain among the fastest growing economies of the world in the medium term.

5.3 Trends in Growth in Coming Year:

We expect India to continue to post growth in the range of 6 to 7% over the coming years. The RBI will be tested in the coming quarters where it would like to keep interest rates low to promote investment and overall economic growth.

It is also anticipated that Indian economy will continue to boom at a slower pace. Real GDP growth (on an expenditure basis) is forecasted to slow from 9.2% in fiscal year 2006-07 (April – March) to an annual average of 7.6 % between 2007-08 and 2011-12. IT’s output will also grow rapidly in the forecasted period showing India’s cost advantages in these sectors.

The RBI will maintain a bias towards monetary tightening in 2007 to bring down the inflation. Monetary policy will move to more neutral orientation in 2008-11, provided annual wholesale price inflation does not exceed the RBI’s target range of 4.5-5% for a sustained period of time.
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The table 5.2 (Fig. 5.2) clearly indicates the upcoming variations in the different indicators.

**TABLE 5 – 2**

**VARIATION IN DIFFERENT INDICATORS OF THE ECONOMY**

<table>
<thead>
<tr>
<th>Key Indicators</th>
<th>2006</th>
<th>2007</th>
<th>2008</th>
<th>2009</th>
<th>2010</th>
<th>2011</th>
</tr>
</thead>
<tbody>
<tr>
<td>Real GDP growth (%)</td>
<td>9.2</td>
<td>8.5</td>
<td>8.0</td>
<td>7.6</td>
<td>7.1</td>
<td>7.0</td>
</tr>
<tr>
<td>Consumer Price Inflation ( av. %)</td>
<td>6.2</td>
<td>5.9</td>
<td>5.2</td>
<td>5.0</td>
<td>5.0</td>
<td>5.0</td>
</tr>
<tr>
<td>Budget Balance(% of GDP)</td>
<td>-3.7</td>
<td>-3.4</td>
<td>-3.0</td>
<td>-3.2</td>
<td>-3.0</td>
<td>-2.8</td>
</tr>
<tr>
<td>Current-account balance (% of GDP)</td>
<td>-1.1</td>
<td>-1.6</td>
<td>-1.8</td>
<td>-1.5</td>
<td>-1.4</td>
<td>-1.6</td>
</tr>
<tr>
<td>Lending Rate (av.%)</td>
<td>11.2</td>
<td>11.5</td>
<td>11.3</td>
<td>10.7</td>
<td>10.2</td>
<td>10.0</td>
</tr>
<tr>
<td>Exchange rate Rs.US$ (av)</td>
<td>45.3</td>
<td>41.8</td>
<td>41.0</td>
<td>41.0</td>
<td>41.0</td>
<td>41.0</td>
</tr>
</tbody>
</table>

*Source: Economic News paper Limited 2007 (An Economist Group Business)*

5.4 **Challenges to sustain Growth in India:**

Since the introduction of the liberalisation programme in 1991, economic growth accelerated. The planning commission and the CSO have been working overtime to assess the challenges that India must overcome to sustain rapid economic growth and reduce poverty over the long term.

A number of policies have contributed to the relatively slow growth in India in spite of too much efforts being enforced on them.
Fig. 5.2
Variation in different indicators of the Economy

- Real GDP growth (%)
- Consumer Price Inflation (av.%)
- Budget Balance (% of GDP)
- Current-account balance (% of GDP)
- Lending Rate (av.%)
- Exchange rate Rs.US$ (av.)
These are some main obstacles to sustain long-term growth in India.

5.4.1 Inadequate Infrastructure:

(1) Electricity:

Three central GOEs generate most of India’s electricity, while state electricity boards (SEBs) distribute the electricity.

The demand for electricity exceeds its supply by 7% on average and by 12% at peak usage. Chronic shortages cause frequent outages, reduce the output of Indian manufacturers by 8.4%, four times the output loss rate in China.

(2) Transportation:

India’s airports, ports, railways and roads are grossly inadequate. The Investment Commission of India (ICI) reported that India must spend $19 billion (2.5% of 2005 GDP) over the next nine years on port facilities to increase efficiency. As far as Indian Railways is concerned, extremely high rail costs have caused manufacturers to shift the bulk of their domestic freights to trucks. Unfortunately India’s road system cannot accommodate this demand. These led to the slow growth in India in the past and still posing some future problems.

5.4.2 Workforce Quality:

Soaring demand for English-speaking managerial, professional, and technical workers from India’s booming knowledge intensive and
capital intensive industries are now outstripping its previously plentiful supply. Moreover unskilled labourers at a large scale have ignited a bidding war. Widespread adult illiteracy prevents many Indian workers from securing jobs in knowledge-intensive and capital-intensive industries.

5.4.3 Incomplete Economic Reforms:

Since the inception of economic reforms in 1991, the government statistics have carried even less credibility than in the past. India still ranked 134th of 175 economies as an overall place to do business according to the World Bank report 2006.

The following areas have been neglected in the domain of economic reforms, which are to be revamped urgently.

(1) Rigid labour market:

India's rigid labour laws are a major impediment to labour intensive manufacturing.

India's labour laws apply to employers with ten or more workers, become more stringent as the number of employees increase, encourage unionisation and generally favour workers over employers. This creates hindrance in the smooth functioning of the economy.
CHAPTER-5 CORRELATION BETWEEN MONETARY POLICY
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(2) Remnants of Licence Raj:

India's ranking in opening new facilities, paying taxes, trading across boarders, enforcing contracts and closing a bankrupt business are lower than the economies in its peer group.

(3) Inefficient Govt. Dominated Financial System:

India's Central Government controlled financial system is highly inefficient in channelling India's saving into productive investment. India has an impressive saving rate of 32.5% of GDP, but only one-half of household saving is channelled through banks and other financial institutions.

Since banks cannot lend gold bars and jewellery, a large portion of Indian savings cannot be intermediated into economically productive investments through banks and other financial institutions. This reduces the potential size of India's economy.

(4) International Trade and Investment Liberalization:

India's international trade flows do not compare favourably with competing Asian economies further. India trailed competing Asian economies in attracting FDI. From 1991 to 2005; India's average annual FDI inflows were equivalent to 0.7% of GDP.

India's two-way goods trade, as a percent of GDP was only 32% in 2005, lowers among the peer group.
5.4.4 Corruption:

India ranked 70th of 163 countries in the year 2006 corruption perceptions index compiled by Transparency International, tied with China.

In the World Bank Investment climate survey, 38.1% of Indian firms cited corruption as a major obstacle to economic growth.

5.4.5 Chronic Large Fiscal Deficits:

In fiscal year 2006-07, the consolidated deficit for both the central and state Governments was 6.3% of GDP. This high fiscal deficit may also deter in accelerating the economic growth in India.

5.5 Growth and Inflation

The subject of inflation and growth dynamics has created the debates among the structuralists and monetarists regarding the approaches. According to the structuralists, inflation has a positive impact on growth while the monetarists argue that inflation has a retarding effect on growth. In this contact, Tobin (1960) propagated that as money and capital are substitutable, an increase in the inflation rate could lead to capital accumulation, which in turn establishes a positive relationship between inflation and economic growth, called the Tobin effect. Further some economists see a direct relationship between inflation and economic growth up to certain point but there could be trade offs beyond that threshold.1
The crucial question that is being debated in India as elsewhere is whether the pursuit of the objective of price stability by monetary authorities undermines the ability of the economy to attain and sustain high growth. Much of the study has been devoted to the trade off between economic growth and inflation. Thus the question of what monetary policy can or cannot do in the context of the deceleration is inextricably linked to the debate on the issue of neutrality of money, which remains unsettled. 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 the prices, so that an increase in money supply will decrease the real wages and bring down unemployment. This idea was later given an empirical justification by A.W. Phillips through his celebrated Phillips curve relationship between inflation and unemployment. If expanding the Phillips curve with expectations showed that the trade off between unemployment in inflation could possibility exist in the short run.

However, in the long run there was no trade off. The long run Philips curve becomes almost vertical at the natural rate of unemployment. Even the possibilities of trade off between inflation and unemployment in the short run is being disputed by adherents of rational expectation theory. The empirical research on inflation and
growth linkage in the cross-country setting though not conclusive, leads to a general finding that inflation adversely affects the 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 percent. However there is some inconclusiveness about the empirical evidences on the short run relationship between inflation and growth.\(^3\)

Further it was argued that long and variable lags in the operation of monetary policy can destabilize the impact of counter-cyclical monetary policy and accordingly the desired short run impact was virtually unpredictable. The expansionary monetary policy to fight a down turn can take effect when the economy is booming. This led to the advocacy for resisting the temptation to exploit the possible short run trade off and to set up a rigid rule fixing the growth rate of money stock to the trend growth rate of output.

Growing recognition of the powerful effects of monetary policy on the real economy has employed that monetary authorities have been forced to take positions on the short run trade-off between growth and inflation and the choice severely conditioned by the losses of macroeconomic welfare that can arise as a result of an in appropriate position along the growth inflation curve. This choice has become even more
severely constrained given the conviction that this curve has non-linear
segments showing that growth and inflation are positively related along
a certain portion of the curve and negatively related elsewhere.

In the language of business cycle it implies that growth and
inflation are both pro-as well counter cyclical. At the operational level it
implies that inflation at low levels is beneficial for growth by greasing the
wheels of the economy but there is a point beyond which inflation
becomes inimical for growth.

The inflation in the 1970s caused by the oil price hikes and
agricultural supply stocks has drawn the attention of the policy makers.
There was a lake of consensus about the tolerable rate of inflation The
reference of the Chakravarty Committee to 4% as the acceptable rise in
prices can be regarded as the first influential fixed on the threshold rate
of inflation in India testing for the thresholds within the framework of a
macro economic model suggested a range of 5 to 7 percent, initially 6 to
7 percent and eventually 5 to 6 percent. Various methodologies adopted
for the conduct of study in the Indian context have regarded a range
from 4 to 7 percent for the threshold inflation rate. The lower bound of 4
percent regarded as growth neutral inflation rate with the positive efforts
of inflation petering off after 7%. There is not much empirical support for
the trade off between the anticipated rate of inflation and growth
although the negative effects of inflation on growth are robustly
confirmed. A recent study suggests that for inflation up to 6.5%, the growth objective of monetary policy can take precedence over the price stability objective. However once the inflation level reaches 6.5%, the price stability objective should be given greater relative importance with the prolonged price stability at the global level as well as in India, the threshold rate is expected to move downwards.

Many empirical studies conducted in order to measure the threshold inflation for India show that the results are sensitive to the methodology. There is no unanimity on the specification of the appropriate model for estimating the relationship between growth and inflation. This is because the relationship itself is possibly changing fairly and rapidly. Thus it is essential on the part of monetary authorities that anyhow the inflation rate should stabilise in the near neighbourhood of its threshold level. For this an optimal rate of money growth is essential because there is a long run relationship between money, inflation and growth. This relationship can be explained by an equation.

\[ \pi_t = \mu_t \cdot \gamma \times g_t \]

Where, \( \pi \) is the rate of inflation; \( \mu_t \) is the rate of money supply, \( \gamma \) is the income elasticity of money demand and \( g_t \) is the rate of growth. Let us suppose that:

\[ \gamma = 1.25 \]
\[ \pi = 5\% \text{ (threshold level)} \]
\[ g = 7-8\% \text{ (targeted)} \]
CHAPTER-5 CORRELATION BETWEEN MONETARY POLICY AND ECONOMIC GROWTH: AN ANALYSIS

After putting all these values in the given equation, the optimal level of monetary expansion would be around 14-15%. Mind it that if the money supply is less than this level, it can decrease the growth rate leading to the recession. On the other hand the money supply more than this level will lead to rise the inflation and jeopardize the price stability objective. Thus, the results broadly suggests that the monetary expansion of 14-15% would be sufficient to ensure that economic activity is maximised without fuelling inflationary expectation.

In India since monetary policy plays a dominant role in economic growth, hence the analysis has to be made to know as to how monetary policy affects output and inflation. For this purpose correlation coefficient between inflation and growth, between money supply and inflation and between money supply and growth have determined which is clear from table table 5.3 (fig 5.3 a, b, c and d).

TABLE - 5.3
MONEY SUPPLY, INFLATION AND GROWTH

<table>
<thead>
<tr>
<th>Year</th>
<th>Growth Rates</th>
<th>3-Year Moving Average</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Real GDP</td>
<td>Inflation (WPI)</td>
</tr>
<tr>
<td>1990-91</td>
<td>5.4</td>
<td>10.32</td>
</tr>
<tr>
<td>1991-92</td>
<td>0.8</td>
<td>13.90</td>
</tr>
<tr>
<td>1992-93</td>
<td>5.3</td>
<td>10.00</td>
</tr>
<tr>
<td>1993-94</td>
<td>6.2</td>
<td>8.40</td>
</tr>
<tr>
<td>1994-95</td>
<td>7.8</td>
<td>10.90</td>
</tr>
<tr>
<td>1995-96</td>
<td>7.6</td>
<td>7.80</td>
</tr>
</tbody>
</table>
CHAPTER-5 CORRELATION BETWEEN MONETARY POLICY AND ECONOMIC GROWTH: AN ANALYSIS

<table>
<thead>
<tr>
<th>Year</th>
<th>GDP</th>
<th>Inflation</th>
<th>Money Supply</th>
<th>Inflation</th>
<th>Growth</th>
<th>Inflation</th>
</tr>
</thead>
<tbody>
<tr>
<td>1996-97</td>
<td>7.8</td>
<td>6.40</td>
<td>16.00</td>
<td>6.80</td>
<td>6.33</td>
<td>15.40</td>
</tr>
<tr>
<td>1997-98</td>
<td>5.0</td>
<td>4.80</td>
<td>17.00</td>
<td>6.20</td>
<td>5.73</td>
<td>15.40</td>
</tr>
<tr>
<td>1998-99</td>
<td>5.8</td>
<td>6.00</td>
<td>13.20</td>
<td>5.60</td>
<td>4.66</td>
<td>14.93</td>
</tr>
<tr>
<td>1999-2000</td>
<td>6.0</td>
<td>3.20</td>
<td>14.60</td>
<td>5.4</td>
<td>5.46</td>
<td>14.83</td>
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<td>2000-01</td>
<td>4.4</td>
<td>7.2</td>
<td>16.70</td>
<td>5.4</td>
<td>4.66</td>
<td>15.13</td>
</tr>
<tr>
<td>2001-02</td>
<td>5.8</td>
<td>3.6</td>
<td>14.1</td>
<td>4.73</td>
<td>4.73</td>
<td>15.16</td>
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<tr>
<td>2002-03</td>
<td>4.0</td>
<td>3.4</td>
<td>14.7</td>
<td>6.1</td>
<td>4.16</td>
<td>15.16</td>
</tr>
<tr>
<td>2003-04</td>
<td>8.5</td>
<td>5.5</td>
<td>16.7</td>
<td>6.61</td>
<td>5.13</td>
<td>14.53</td>
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<tr>
<td>2004-05</td>
<td>7.5</td>
<td>6.5</td>
<td>12.2</td>
<td>8.33</td>
<td>5.56</td>
<td>15.43</td>
</tr>
<tr>
<td>2005-06</td>
<td>9.0</td>
<td>4.7</td>
<td>17.4</td>
<td>8.51</td>
<td>5.7</td>
<td>16.8</td>
</tr>
<tr>
<td>2006-07</td>
<td>9.2</td>
<td>5.9</td>
<td>20.8</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

\[ r^* = -0.374 \]
\[ r^{**} = 0.418 \]
\[ r^{***} = 0.071 \]

*Correlation between inflation and growth
**Correlation between inflation and money supply
***Correlation between money supply and growth

Source: Economic Surveys: various issues (1990-2007)
BIS papers, No. 31 (RBI Projection of Indicators and Actual, 2007)

In order to analyse the above table the period from 1990 to 2007 has been taken into account. It is apparent from the table that there is a moderate and fluctuating inverse relationship between the GDP and inflation (WPI). It also shows during the period 2000-2007 the minimum inflation is 3.4% (2002-03) and maximum inflation is 7.2% (2000-01). It means that the check and balance instrument introduced by RBI is capable enough to keep the inflation within the threshold limit advocated by various economists of Indian sub continents. Further there is positive and direct relationship between money supply and inflation. The relationship between money supply and inflation is coherent with
Fig. 5.3.a
Variations in Money Supply, Inflation and Growth 1990-91 to 1999-07
Fig. 5.3.b
Variations in Money Supply, Inflation and Growth 1990-91 to 1999-07
Fig. 5.3c
Variations in Money Supply, Inflation and Growth 1990-91 to 1999-07
(3-years Moving Averages)
Fig. 5.3.d
Variations in Money Supply, inflation and Growth 1990-91 to 1999-07
(3-years moving averages)
the theoretical aspect advocated by classical school of thought and modern school of thought.

For empirical evidence correlation coefficient has been calculated for the same set of data. The correlation coefficient between real GDP and inflation is worked out to (-0.374). The relationship is said to be significant at \( r=0.139 \). But our calculated value is (-0.374). The calculated value is much more less than the significant value. The table value itself reveals that there is a weak and meagre relationship between inflation and real GDP in general. In Indian context the calculated value is \(-0.374\) which itself less than the internationally recognised value of correlation coefficient. It carries a vital piece of information that there is a very weak relationship between inflation and real GDP. It means that a better performance witnessed during the given period (1990-07) is attributed to the structural and institutional readjustments adopted by India. Further a proper trade-off between inflation and growth is required to put the economy on the growing path and to feel the essence of the zenith.

The correlation coefficient between inflation and money has been also worked out and it is 0.418. It shows that there is moderate positive relationship between inflation and money supply, which is coherent with the theoretical aspects.
The correlation coefficient between real GDP and money supply has been worked out to 0.071. Thus it is apparent from the finding that there is a weak and meagre relationship between real GDP and money supply. This is because the relationship is significant at \( r = 0.787 \) (at 5\% level of significance). This finding is also coherent with economic aspect at our hand. The result further shows that in Indian context the correlation coefficient between real GDP and money supply is almost insignificant (0.071). It implies that monetary policy has not a strong bearing on the Indian economy. Thus, there is a need for making it more active.

A plot of 3 year moving averages of variations in money, output and prices for the period from (1990-91 to 2006-2007) brings out the whole picture vividly.

5.6 Conclusion:

Thus we conclude that with financial liberalization and globalisation, the relationship between money output and prices has turned increasingly volatile and unpredictable. Long and variable lags in monetary policy and changeable transmission channels have posed a considerable challenge for the conduct of monetary policy. The growing complexities of monetary management during the 1990s required that the formulation of monetary policy should be based on the information gathered from a large number of macro-economic indicators rather than
being predicted on a single monetary aggregate. Thus, in view of the changing monetary dynamics, the Reserve Bank of India formally switched over from monetary targeting and broad-based its list of policy indicators in April 1998. The Monetary and Credit Policy Statement of April 1998 announced that the Reserve Bank would: "Adopt a multiple indicator approach wherein interest rates or rates of return in different markets (money, capital and government securities markets) along with such data as on currency, credit extended by banks and financial institutions, fiscal position, trade, capital flows, inflation rate, exchange rate, refinancing and transactions in foreign exchange available on high frequency basis are juxtaposed with output data for drawing policy perspectives."

Although the exclusive use of monetary aggregates has been de-emphasized, it remains an important indicator of the monetary policy stance, with the monetary and credit policy statements announcing monetary projections for the year. It continues to be relevant for India simply because of two basic reasons. First, since the money demand function has remained reasonable stable, it remains helpful in predicting price movements with reasonable accuracy at least over a period of time. Secondly the money stock target relatively well understood by the public at large, with the money supply target, the stance of monetary
policy is unambiguously defined and gives a clear signal to market participants.

Therefore, in the context of Indian economy, the quantity of money continues to play an important role in determining prices. However, the monetary policy authority must watch the behaviour of interest rates in various markets and must intervene and smooth the volatility. At the same time, it is necessary to decompose the sources of inflation in view of the repeated occurrence of supply-side shocks in the economy since the late 1990s.
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