CHAPTER V

SAVING - INVESTMENT GAP AND INFLATION:
EMPIRICAL EVIDENCE.
5.1. In this chapter we seek to analyse some implications of saving-investment gap on inflation in the context of planning in India. During the Planning era, it has been noticed that a relatively moderate rate of growth of the economy has been accompanied by a high rate of inflation, thereby neutralising the benefits of growth to a great extent. The inflationary trend which has been prevailing since the early sixties upset all rational calculations almost in all spheres of economic life of the nation. Some empirical studies seem to indicate that there is an inverse relationship between saving and inflation. For instance, Gupta (1970) found that higher prices tend to discourage real saving. Choudhury (1968) showed that with a rise in prices urban consumers generally would not allow a fall in the money value of their consumption even if this entails a certain amount of sacrifice in their levels of savings. However, there is also a view that a moderate dose of inflation may tend to promote saving. For instance, Thirwall (1974), on the basis of a cross-section study came to the conclusion that the hypothesis of inflation as a stimulus to saving, investment and growth cannot be rejected outright, but is not strongly supported either. This study found that the saving ratio is positively related to the rate of domestic inflation as long as inflation is mild, but negatively related if inflation is excessive. However, "The threshold of 'optimum inflation' is highly notional and it is difficult to generalise about the causal links between inflation, saving and growth" [Economic Bulletin for Asia and the Pacific, 1975, P.180]

5.2 Saving is the source of investment. "A host of factors
influence saving, among which national income is probably the most important. Some of the other factors that are mentioned in typical saving analysis are: the distributions of income among the different sectors or the socio-economic groups in the country, the reward for saving as reflected in the rate of profit earned on direct investment or the yields/interest rates associated with the diverse instruments in which saving is usually held and the rate of change in the general price level. Equally important particularly in an economy like that of India are the institutional factors—special efforts made to mobilise saving on an increasing scale with the establishment of new institutions and popularisation of new instruments to attract savings. To this fairly long list, one more factor, namely the past level of saving could be added if there is reason to believe that the persistence of the saving habit is rather strong”. [Mujundar, 1989, P. 19]

From the data embodied in Economic Survey 1990-91, Govt. of India (Table S-8), we find that the saving scenario of the Indian economy has witnessed a highly satisfactory change in the later half of the 70’s, the gross domestic saving which has been consistently less than 16 per cent of GDP through the twenty three years since 1950-51 (excepting the year 1971-72 in which the percentage was 16.2) rose to 18.4 per cent in 1973-74. It then slightly fell to 17.4 per cent in 1974-75 and then again rose to 19.0 percent in 1975-76 and 21.2 percent in 1976-77. What is more significant is that the saving ratio had been sustained at this rather unusually high level of 21-22 per cent for successively six years from 1976-77 to 1981-82. The year 1978-79 exhibited the highest saving ratio being equal to 23.2 per cent. Though the saving rate was hovering around 18-19 per cent during the years 1982-83 to 1986-87, it again rose to 20.3 per cent in 1987-88,
21.1 per cent in 1988-89 and 21.7 per cent in 1989-90.

As per the CSO’s estimates, gross domestic savings as a ratio of GNP at market prices touched 24 per cent in 1978-79 and net domestic saving as a ratio of NNP at market prices was 19.3 per cent, which K N Raj has rightly described as "rather dramatic improvement". Even the Planning Commission seems to have been baffled by the size of domestic savings. Comparing the CSO's revised estimates of the gross saving ratios for other groups of countries, the Planning Commission writes: "It is apparent that the country has achieved a high saving rate despite its low per capita income. In fact our saving rate is comparable to the rate in middle income and even some high-income industrialised countries". (Planning Commission, Government of India, Revised Draft Sixth Five-Year Plan, 1978-83, New Delhi, December, 1977).

The aggregate savings of Indian economy are generally composed of three sectoral elements:

(a) Public Sector
(b) Household Sector
(c) Corporate Sector (Private and Cooperative)

If \( S = \text{Aggregate savings} \), then \( S = S_h + S_c + S_p \) where \( S_h \) = savings of the household sector, \( S_c \) = savings of the corporate sector and \( S_p \) = savings of the public sector. The savings of the corporate sector and the households are usually lumped together as private saving as distinguished from the public saving. "This distinction stems from the fact that the theories of saving are generally concerned with the former whereas the question of how the level of government saving is determined has been left alone". [Mitra, 1986, P. 32].
The gross domestic savings by sector of origin and the sources of saving in each sector are shown below:

1. Gross Public Savings: Gross public savings consist of the following:

(a) Balance from Current Revenues
(b) Contribution from Public Enterprises
(c) Additional Resource Mobilisation

2. Private saving:

(a) Household sector
   (i) Financial Assets (Net)
   (ii) Physical Assets

(b) Private corporate sector
   (i) Financial Enterprises
   (ii) Non-financial Enterprises

(c) Cooperative Sector
   (i) Financial Institutions (credit cooperatives)
   (ii) Non-financial Institutions (non-credit cooperatives)

Gross Public Savings:

(a) Balance from Current Revenues: Balance from current revenues of the central and the state governments means revenue receipts (mainly tax yields) at existing rates minus non-plan revenue expenditure of the centre and the states and this balance may turn out to be negative.
(b) Contribution from Public Enterprises: The contribution from public enterprises is not much but it has been rising steadily over the years. Its percentage share in total public sector plan resources was 3 per cent in the Second Plan which rose to 9 per cent in the Fourth Plan and then to 10 per cent in the Sixth Plan. Many of the Central Government enterprises have been running on losses and even the contributions of such departmental undertakings as the railways and the posts and telegraphs have been minimal. However, the Reserve Bank of India and other banking and financial institutions and some commercial enterprises like Indian Oil Corporation have been yielding regular profits to the government. On the contrary, state enterprises like the State Electricity Boards and the State Road Transport Corporation which are the two major state enterprises have been running on losses throughout the plan period.

(c) Additional Resource Mobilisation: Under this head we are having two sources, namely, additional taxation and additional revenue from public enterprises. Additional taxation had been the most important source of development finance in all the plans. Additional taxation is collected by increasing the rates and by imposing new taxes and duties. The second source of additional resource mobilisation is the additional revenue from the public enterprises which result from raising the administered prices of goods of these enterprises.

Till the Fourth Five Year Plan the additional tax component of additional resource mobilised for the plans was very significant. However, since the Fifth Plan share of additional taxation in additional resource mobilisation is going down and that of 'reduction in subsidies' and 'internal resources of the public sector enterprises' is going up.
Net Public Saving: This is equal to gross public saving minus current outlay for maintenance of services created during the plan period. Thus public savings net of current outlay is the net public savings available for public investment. Current expenditure (outlay) does not directly result in the creation of productive assets, and, as such, it cannot be considered as investment expenditure. Thus only the savings net of current outlay is available for investment.

Current outlay, by its very nature, should be met from current revenue balance. But due to enormous increase in non-plan revenue expenditure, balance from current revenue sometimes comes out to be negative. Though the First Plan raised as much as 19.5 per cent of the total financial resources in the public sector from this source, in the next three plans (Second, Third and Fourth), the surpluses from current revenues were 0.2%, -4.9% and -1.5% respectively. The realised surpluses in the subsequent two plans (Fifth and Sixth Plans) were much lower than the anticipated surpluses. In the Seventh Plan balance from current revenue again turned out to be a negative figure the percentage share being -5.2 per cent. As such current outlay is to be met from public savings coming from other sources fully or partially.

Private Savings:

(a) Household Sector: The savings of the households in the form of physical assets covers acquisition of productive assets and construction activities like residential and non-residential buildings as well as creation of physical assets through own—
account labour input. The savings of the households in the shape of physical assets is thus a form of direct capital formation in the household sector. Projections of physical assets in the household sector for a plan period are made by studying the relationship with personal disposable income observed in the past years; projections of personal disposable income, in turn, are made by analysing the relationship with GDP.

The different components of the financial assets of the household sector during a plan period are increase in currency with the households, increase in deposits in scheduled commercial banks, cooperative and non-banking companies, increase in the funds of LIC, provident funds which include Central and State Governments' provident funds, employees' provident funds and other provident funds, small savings, shares, debentures and units.

(b) Private Corporate Sector: The private corporate sector consists of non-financial and financial enterprises. Non-financial enterprises cover public and private limited companies while financial enterprises comprise non-nationalised commercial banks and private financial and investment companies. Corporate savings mostly go for the development of private sector.

(c) Cooperative Sector: There is now a sizeable cooperative sector, credit as well as non-credit. Its contribution to total domestic savings is, however, insignificant. Its contribution to total savings depends on running the cooperatives efficiently and economically.

5.3. Investment During Five Year Plans: Total outlay and investment in both public and private sectors has been increasing in absolute terms (Table 5.1) though in relative terms increase has not been similar in both the sectors throughout the planning
period. As percentage of total investment, public sector investment was 46.4 (I Plan), 54.6 (II Plan), 60.6 (III Plan), 60.3 (IV Plan), 57.6 (V Plan), 52.9 (VI Plan) and 47.8 (VII Plan). It is to be observed that while the share of public sector investment was increasing gradually from the First Plan to the Third Plan, it started falling from the Fourth Plan till the Seventh Plan and the position in the Seventh Plan came very much nearer to that of the First Plan when the country started her planned economic development.

Table 5.1
Plan outlays and Investments of Public and Private Sectors in Five-Year Plans.

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Item</th>
<th>First Plan</th>
<th>Second Plan</th>
<th>Third Plan</th>
<th>Fourth Plan</th>
<th>Fifth Plan</th>
<th>Sixth Plan</th>
<th>Seventh Plan</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Public Sector outlay</td>
<td>1,960</td>
<td>4,672</td>
<td>8,577</td>
<td>1,6160</td>
<td>40,712</td>
<td>1,10,821</td>
<td>2,26,638</td>
</tr>
<tr>
<td>2</td>
<td>Public Sector Investment</td>
<td>1,560</td>
<td>3,731</td>
<td>6,300</td>
<td>13,655</td>
<td>36,703</td>
<td>84,000</td>
<td>1,54,000</td>
</tr>
<tr>
<td>3</td>
<td>Private Sector Investment (outlay)</td>
<td>1,800</td>
<td>3,100</td>
<td>4,100</td>
<td>8,980</td>
<td>27,048</td>
<td>74,710</td>
<td>1,68,148</td>
</tr>
<tr>
<td>4</td>
<td>Total Investment</td>
<td>3,360</td>
<td>6,831</td>
<td>10,400</td>
<td>22,635</td>
<td>63,751</td>
<td>158,710</td>
<td>3,22,366</td>
</tr>
<tr>
<td>5</td>
<td>as % of 4</td>
<td>46.4</td>
<td>54.6</td>
<td>60.6</td>
<td>60.3</td>
<td>57.6</td>
<td>52.9</td>
<td>47.8</td>
</tr>
<tr>
<td>6</td>
<td>as % of 4</td>
<td>53.6</td>
<td>45.4</td>
<td>39.4</td>
<td>39.7</td>
<td>42.4</td>
<td>47.1</td>
<td>52.2</td>
</tr>
</tbody>
</table>

(ii) Various Plan Documents, Planning Commission, G.O.I.
5.4. Concept of Saving-Investment Gap During Various Plan Periods:

The concept of saving-investment gap relating to the public sector alone is not the same with that relating to both the public and the private sectors combined together.

The gap between public sector investment and savings can be filled up by borrowing from the domestic household sector, the banking sector and from overseas. If the gap still remains uncovered then the government finally resorts to deficit financing. The borrowing from the household sector is done essentially through three government controlled financial institutions: the post office deposit accounts, provident funds and insurance funds. In addition, the commercial banks mobilise a sizeable portion of household financial savings, the greater part of which are, however, utilised as bank credit to the private sector. The government borrowings from financial institutions are done through regulations and quotas. The open market borrowings of the government is insignificant in India. Its borrowing from financial institutions, however, depends on deposit mobilisations by these institutions which are in turn functions of national income, wealth, interest rate and other factors. If the gap between public investment and public saving (net of current outlay) still remains uncovered by the aforementioned means then the final choice of the government is to resort to deficit financing if the plan is not curtailed.

When we consider the economy as a whole (which consists of public as well as private sector), then the concept of saving-investment gap is somewhat different from the concept relating to the public sector alone. Domestic or internal public borrowing which in one of the means of filling the public sector saving-
investment gap cannot be treated as a means of filling the saving-investment gap relating to the economy as a whole. When we treat the entire economy, internal public borrowing (which is the savings of the private sector) is merely a transfer of savings from the private to the public sector. Moreover, in the context of Indian planning, instead of considering deficit financing as one of the means of filling the saving-investment gap, is considered to be 'forced savings' on the community and the entire volume of deficit financing is shown to be a transfer of savings from the private to the public sector. This can be seen, for example, from the statement of the financing of the aggregate outlay and the estimate of the public sector financial resources of the Sixth Five Year Plan. The following tables (Table 5.2 and 5.3) show the financing of the aggregate plan outlay for the Sixth Plan which is incorporated in page 63 of the Sixth Five Year Plan document, Government of India, Planning Commission.

Table 5.2.
Financing of the Aggregate Outlay: 1980-85 (original) (Rs. in crores at 1979-80 prices)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Sector</th>
<th>Own Saving</th>
<th>Public</th>
<th>Private</th>
<th>Rest of the World</th>
<th>Investment outlay</th>
<th>Current aggregate outlay</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>(0)</td>
<td>(1)</td>
<td>(2)</td>
<td>(3)</td>
<td>(4)</td>
<td>(5)</td>
</tr>
<tr>
<td></td>
<td></td>
<td>(6)</td>
<td>(7)</td>
<td>(8)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Public</td>
<td>34200</td>
<td>-(2525)</td>
<td>(+41396)</td>
<td>10929</td>
<td>84000</td>
<td>13500</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Private</td>
<td>115447</td>
<td>+(2525)</td>
<td>(-41396)</td>
<td>-1866</td>
<td>74710</td>
<td>---</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Total</td>
<td>149647</td>
<td></td>
<td></td>
<td></td>
<td>9063</td>
<td>158710</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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### Table 5.3

**Estimate of Financial Resources for the Public Sector Plan 1980–85**

(Original)

(Rs. crores at 1979-80 prices)

<table>
<thead>
<tr>
<th>Sl. No.</th>
<th>Items</th>
<th>Amount</th>
</tr>
</thead>
<tbody>
<tr>
<td>(0)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(1)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>(2)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1.</td>
<td>Balance from current revenues at 1979–80 rates of taxes</td>
<td>14478</td>
</tr>
<tr>
<td>2.</td>
<td>Contribution of Public Enterprises</td>
<td>9395</td>
</tr>
<tr>
<td>3.</td>
<td>Market Borrowings of Government, Public enterprises and local bodies</td>
<td>10500</td>
</tr>
<tr>
<td>4.</td>
<td>Small Savings</td>
<td>6463</td>
</tr>
<tr>
<td>5.</td>
<td>State Providend Funds</td>
<td>3702</td>
</tr>
<tr>
<td>6.</td>
<td>Term loans from financial institutions (Gross)</td>
<td>2722</td>
</tr>
<tr>
<td>7.</td>
<td>Miscellaneous capital receipts (Net)</td>
<td>4009</td>
</tr>
<tr>
<td>8.</td>
<td>External assistance and borrowing from rest of the world (Net)</td>
<td>9929</td>
</tr>
<tr>
<td>9.</td>
<td>Drawing down of Foreign Exchange Reserves</td>
<td>1000</td>
</tr>
<tr>
<td>10.</td>
<td>Additional Resource Mobilisation</td>
<td>21302</td>
</tr>
<tr>
<td>11.</td>
<td>Uncovered gap/deficit financing</td>
<td>5000</td>
</tr>
<tr>
<td>12.</td>
<td>Aggregate resources</td>
<td>975000</td>
</tr>
</tbody>
</table>

From tables 5.2 and 5.3 above we find that the volume of Rs. 41396 crores which is a transfer of private savings to the public sector includes the volume of deficit which stands at Rs. 5000 crores. We find, Rs. 41396 = Rs. (19500 + 6463 + 3702 + 2722 + 4009 + 5000).

Although the entire volume of deficit financing is shown as forced savings on the community, yet only a part of it should be considered as forced saving. "When inflation occurs as a result of deficit spending, consumption must decline as a result of rising prices and, therefore, saving become forced. But it is important
to remember that inflation reduces compulsorily the consumption of only fixed income earners; the consumption of higher income groups generally increase during the same period." [Datt and Sundharam, 1993, P. 782] We find from table 5.2 that only the net foreign inflow comes in to fill up the gap between domestic saving (net of current outlay) and domestic investment. Thus we have,

\[ I - S = FA \]

Where \( I \) = Domestic investment  
\( S \) = Domestic savings net of current outlay  
\( FA \) = Net foreign assistance

Like the Sixth Plan Document, in all other plan documents we find that only the net foreign inflow is shown as the instrument of filling the gap between saving and investment.

5.5. Saving-Investment Gap in the Context of Present Study

In the context of our present study domestic savings relate to the savings at the pre-plan year rates of taxes and tariffs and pricing of public sector enterprises net of current outlay. Thus the domestic savings at the pre-plan year rates of taxes and tariffs and pricing of public sector enterprises net of current outlay is the savings available for investment. Since in the context of Indian planning, this saving always falls short of the required investment, as such the gap between saving and investment is filled up basically by three means viz., (a) Additional resource mobilisation, (b) Net foreign assistance and (c) Deficit financing. Thus in the context of our study

\[ I - S = ARM + FA + DF. \]
Where \( I = \) Savings at pre-plan year rates of taxes and tariffs and pricing of public sector enterprises net of current outlay

\[
\text{ARM} = \text{Additional resource mobilisation}
\]
\[
\text{FA} = \text{Foreign assistance (net)}
\]
\[
\text{DF} = \text{Deficit financing}
\]

Basic assumption: our basic assumption is that resources mobilised through additional taxation and raising of administered prices of goods and services of public sector enterprises are not used to finance current outlay. This assumption is necessary due to the reason that current outlay is not an investment expenditure and figures relating to the utilisation of additional taxation and resources mobilised through raising of administered prices in current outlay are not available.

We present below two tables relating to our concept of S-I gap and the various gap-filling instruments. Table 5.4 shows the volumes of savings (at pre-plan rates of taxes and tariffs and administered prices), investment and the three gap-filling instruments, viz; Additional Resource Mobilisation (ARM), Foreign Assistance (FA) and Deficit Financing (DF) at pre-plan prices, 1970-71 prices and 1980-81 prices. Table 5.5 shows the planwise S-I gap at pre-plan prices, 1970-71 prices and 1980-81 prices.
Table 5.4

Planwise Figures of Savings, Investment and Various Gap-Filling Instruments

(a)

<table>
<thead>
<tr>
<th>Plan</th>
<th>((a_1))</th>
<th>((b_1))</th>
<th>((c_1))</th>
<th>((a_2))</th>
<th>((b_2))</th>
<th>((c_2))</th>
<th>((a_3))</th>
<th>((b_3))</th>
<th>((c_3))</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Plan</td>
<td>2550</td>
<td>5357</td>
<td>13793</td>
<td>255</td>
<td>536</td>
<td>1379</td>
<td>222</td>
<td>466</td>
<td>1190</td>
</tr>
<tr>
<td>Second Plan</td>
<td>3904</td>
<td>9570</td>
<td>24623</td>
<td>1052</td>
<td>2578</td>
<td>6634</td>
<td>921</td>
<td>2257</td>
<td>5807</td>
</tr>
<tr>
<td>Third Plan</td>
<td>4412</td>
<td>8006</td>
<td>20599</td>
<td>2892</td>
<td>5249</td>
<td>13506</td>
<td>1963</td>
<td>3563</td>
<td>9168</td>
</tr>
<tr>
<td>Annual Plans</td>
<td>9125</td>
<td>12551</td>
<td>32294</td>
<td>910</td>
<td>1252</td>
<td>3221</td>
<td>2330</td>
<td>3205</td>
<td>8246</td>
</tr>
<tr>
<td>(1966-69)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourth Plan</td>
<td>12535</td>
<td>13730</td>
<td>35327</td>
<td>4280</td>
<td>4688</td>
<td>12062</td>
<td>3760</td>
<td>4118</td>
<td>10596</td>
</tr>
<tr>
<td>Fifth Plan</td>
<td>44069</td>
<td>31545</td>
<td>81165</td>
<td>10300</td>
<td>7373</td>
<td>18971</td>
<td>5822</td>
<td>4168</td>
<td>10724</td>
</tr>
<tr>
<td>Annual Plans</td>
<td>17580</td>
<td>9462</td>
<td>24346</td>
<td>1509</td>
<td>812</td>
<td>2089</td>
<td>1139</td>
<td>613</td>
<td>1577</td>
</tr>
<tr>
<td>(1979-80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sixth Plan</td>
<td>106160</td>
<td>48790</td>
<td>125529</td>
<td>32970</td>
<td>15152</td>
<td>38986</td>
<td>8045</td>
<td>3697</td>
<td>9512</td>
</tr>
<tr>
<td>Seventh Plan</td>
<td>240206</td>
<td>70983</td>
<td>182640</td>
<td>25023</td>
<td>7395</td>
<td>19027</td>
<td>18592</td>
<td>5454</td>
<td>14136</td>
</tr>
</tbody>
</table>
Note: $S =$ Domestic savings at pre-plan rates of taxes, and tariffs and administered prices of public sector enterprises net of current outlay.

ARM = Additional resource mobilisation

EA = External assistance

DF = Deficit financing

$I =$ Investment (public + private)

$(a_1), (a_2), (a_3), (a_4)$ and $(a_5):$ At pre-plan prices.

$(b_1), (b_2), (b_3), (b_4),$ and $(b_5):$ At 1970-71 prices.

$(c_1), (c_2), (c_3), (c_4),$ and $(c_5):$ At 1980-81 prices.

<table>
<thead>
<tr>
<th></th>
<th>$DF$</th>
<th></th>
<th>$I$</th>
</tr>
</thead>
<tbody>
<tr>
<td>($a_1$)</td>
<td>333</td>
<td>700</td>
<td>1801</td>
</tr>
<tr>
<td>($b_1$)</td>
<td>954</td>
<td>2338</td>
<td>6016</td>
</tr>
<tr>
<td>($c_1$)</td>
<td>1133</td>
<td>2056</td>
<td>5290</td>
</tr>
<tr>
<td>($a_2$)</td>
<td>676</td>
<td>930</td>
<td>2393</td>
</tr>
<tr>
<td>($b_2$)</td>
<td>2060</td>
<td>2256</td>
<td>5805</td>
</tr>
<tr>
<td>($c_2$)</td>
<td>3560</td>
<td>2548</td>
<td>6556</td>
</tr>
<tr>
<td>($a_3$)</td>
<td>1355</td>
<td>729</td>
<td>1876</td>
</tr>
<tr>
<td>($b_3$)</td>
<td>11530</td>
<td>5298</td>
<td>13658</td>
</tr>
<tr>
<td>($c_3$)</td>
<td>38545</td>
<td>11390</td>
<td>29306</td>
</tr>
</tbody>
</table>

174

(a): Upto the Annual Plan 1979-80-RBI Reports on currency and Finance, various issues; Figures for the Sixth Plan and the Seventh Plan which are at current prices are obtained from Economic Survey, G.O.I., 1990-91 and these figures have been converted to 1970-71 prices and 1980-81 prices by conversion procedure.

(a): Indian Economic Statistics—Public Finance, G.O.I., Ministry of Finance, December 1983; RBI Reports on currency and Finance Vol II, 1990-91, PP.124-125. The deficit financing figure for the Sixth Plan at current prices is Rs. 15684 crores which has been converted into the pre-plan prices of Rs.11530 crores.


(a): (a) -(a) -(a) -(a)  (b) -(b) -(b) -(b)  (c) -(c) -(c) -(c).

Note: (i) Regarding the planwise figures of ARM,EA and DF at pre-plan prices incorporated in the above table we are to say that
when the prices are given at current prices, we convert them into pre-plan year prices. Sometimes prices for a few years of a particular plan period are given at pre-plan prices and the prices for the subsequent years of the plan are given in terms of current prices. In such cases we express the current year prices in terms of the pre-plan year prices. In many cases, it is not mentioned whether the figures are at current prices or at pre-plan year prices. In such cases, the same figure is assumed to be at current price whenever we require current price figure and also to be at pre-plan year price whenever we require pre-plan year price figure.

(ii) Figures in terms of new base year are obtained by using the following formula: Recast index number of any year

\[
= \frac{\text{Old index number of the year}}{\text{Index number of new base year}} \times 100
\]

(iii) While converting figures, we make use of the table 3.4 of chapter III
### Table 5.5

**Planwise Saving-Investment Gap**

<table>
<thead>
<tr>
<th>Plan Period</th>
<th>Saving at Pre-Plan Prices</th>
<th>Investment Gap at Pre-Plan Prices</th>
<th>Saving at 1970-71 Prices</th>
<th>Investment Gap at 1970-71 Prices</th>
<th>Saving at 1980-81 Prices</th>
<th>Investment Gap at 1980-81 Prices</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Plan</td>
<td>2550</td>
<td>3360</td>
<td>1110</td>
<td>5357</td>
<td>7059</td>
<td>1702</td>
</tr>
<tr>
<td>Second Plan</td>
<td>3904</td>
<td>6831</td>
<td>2927</td>
<td>9570</td>
<td>16743</td>
<td>7173</td>
</tr>
<tr>
<td>Third Plan</td>
<td>4412</td>
<td>10400</td>
<td>5988</td>
<td>8006</td>
<td>18874</td>
<td>10868</td>
</tr>
<tr>
<td>Annual Plans (1966-69)</td>
<td>9125</td>
<td>13041</td>
<td>3916</td>
<td>12551</td>
<td>17938</td>
<td>5387</td>
</tr>
<tr>
<td>Fourth Plan</td>
<td>12535</td>
<td>22635</td>
<td>10100</td>
<td>13730</td>
<td>24792</td>
<td>11062</td>
</tr>
<tr>
<td>Fifth Plan</td>
<td>44069</td>
<td>63751</td>
<td>19682</td>
<td>31545</td>
<td>45634</td>
<td>14089</td>
</tr>
<tr>
<td>Annual Plans (1979-80)</td>
<td>17580</td>
<td>21583</td>
<td>4003</td>
<td>9462</td>
<td>11616</td>
<td>2154</td>
</tr>
<tr>
<td>Sixth Plan</td>
<td>106160</td>
<td>158710</td>
<td>52550</td>
<td>48790</td>
<td>72937</td>
<td>24147</td>
</tr>
<tr>
<td>Seventh Plan</td>
<td>240206</td>
<td>322366</td>
<td>82160</td>
<td>70983</td>
<td>95266</td>
<td>24283</td>
</tr>
</tbody>
</table>

N.B: Estimated from table 5.4.


Under additional resource mobilisation there are two sources of raising funds for investment. The first is additional taxation which has been the most important source in all the
plans. The second is the additional resource mobilisation through public sector enterprises by raising their prices, i.e., by raising the administered prices of their goods and also by other measures, viz., improvement in capacity utilisation, raising the productivity levels and drawing down of the inventories, etc. The government finds it easy to raise the administered prices of goods and services produced and sold by the public sector enterprises, such as petrol, steel, coal, etc. However, the public opinion to the price hike in essential commodities cannot be disregarded totally by the government while raising additional resources through this method.

Additional taxation has been an important source of financing investment expenditures in all the plans. While the tax burden on the urban consumers seems to have reached the maximum, there is considerable scope for additional taxation on rural incomes. There is high degree of prosperity among the farmers due to the Green Revolution and part of the additional income of the farming community could be easily collected for development purposes. Landlords and capitalist farmers pay only a pittance out of their fabulous incomes resulting from Green Revolution. On the other hand, commodity taxes (excise, sales and custom duties) have increased many times during the planning period. When customs is excluded, the increase was about 40 times within the first 25 years of planning. Central excise alone has recorded a 65-fold increase within 25 years from the beginning of planning in India.

When commodity taxes like union excise duties and sales tax are increased they add to the prices in the immediate
Along with this rise in prices, if money incomes are also raised, there will not be any fall in either money or real demand, and as a result the demand-pull inflation is re-inforced by tax-push inflation. However, if money income remains constant or falls, it may reduce real demand and bring partial and sectoral recession. But the impact of tax, particularly indirect taxes, is to push up the prices. Further, direct taxes are shifted on to the consumers of the products produced by companies. The process of shifting such direct taxes takes some time and hence such direct taxes affect prices after a time lag. Indirect taxes, however, are immediately shifted on to the consumers as soon as they are announced. Manufacturers, wholesalers and retailers immediately shift the increased amount of tax in the form of higher prices of commodities. In the context of a seller’s market prevailing in India, and the protection from foreign competition, this business practice is made easy. Periodic hikes in the rates of indirect taxes, particularly union excise duties and sales tax, have created a tax—pushed price rise. In this way, instead of reducing inflation, taxation adds to price rise in a country like India. "Though increases in price rise due to shifting of taxes is not reckoned as inflation, they do cut into the real income or consumption of those on whom they fall. In other words, in so far as it is reflected in higher prices, indirect taxes have, more or less, the same effect on consumers as inflationary financing though the course and effects of the latter are more unpredictable". [Thavaraj, 1974, P. 113].

G. Thimmaiah (1986) has examined the impact of taxation on the price level by using regression analysis. For the purpose of
testing empirically the hypothesis that taxation adds to price rise in India, Thimmaiah has used in addition to the wholesale price index, GNP deflator (GNP def.), and consumer price deflator (cons. def.) as dependent variables. Total tax revenue ($T$), revenue from direct taxes ($T_{d}$), revenue from indirect taxes ($T_{i}$), tax revenue from union excise duties ($U$) and revenue from sales tax ($ST$) have been used as explanatory variables in partial regression equations. He has included in addition to $T, ST, U,$ index of foodgrains production ($F$), government expenditure ($E$), money supply ($M$), budget deficit ($D$), private investment ($I$), as explanatory variables in multiple regression equations. He has used both multiple and partial regression analysis to test basically the impact of taxation on the wholesale price level. The period covered is from 1960-61 to 1981-82. He has used the double log form to estimate the regression coefficients. The empirical results are presented in the following two tables. (Tables 5.6.A and 5.6.B)
Table 5.6.A

Partial Regression Results Relating to the Impact of Taxation on Price Level

<table>
<thead>
<tr>
<th>Dependent Variable</th>
<th>Explanatory Variables</th>
<th>Summary Statistics</th>
<th>D-W Statistic</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>R² F-Value stics</td>
</tr>
<tr>
<td></td>
<td>Ti Td T U ST</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Pw = 93.8655</td>
<td>+0.218 log Ti</td>
<td>0.9660 626.57 0.7400</td>
<td></td>
</tr>
<tr>
<td>(12.8090)</td>
<td>(25.0314)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Pw = 61.3032</td>
<td>+0.1014 log Td</td>
<td>0.9658 622.37 1.3901</td>
<td></td>
</tr>
<tr>
<td>(7.3020)</td>
<td>(24.9474)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Pw = 87.6992</td>
<td>+0.0180 log T</td>
<td>0.9689 686.78 0.8764</td>
<td></td>
</tr>
<tr>
<td>(12.2053)</td>
<td>(26.2066)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log GNP = 66.7158</td>
<td>+0.03971 log ST</td>
<td>0.9387 338.79 0.4232</td>
<td></td>
</tr>
<tr>
<td>(def) (15.6228)</td>
<td></td>
<td></td>
<td>(18.4065)</td>
</tr>
<tr>
<td>Log GNP = 53.3178</td>
<td>+0.0242 log U</td>
<td>0.9710 747.58 0.7858</td>
<td></td>
</tr>
<tr>
<td>(def) (16.2163)</td>
<td>(27.1584)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log GNP = 55.2926</td>
<td>+0.0084 log T</td>
<td>0.9604 535.48 0.5735</td>
<td></td>
</tr>
<tr>
<td>(def) (14.6099)</td>
<td>(23.1405)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Cons. = 62.1683</td>
<td>+0.0408 log ST</td>
<td>0.8213 103.11 1.7360</td>
<td></td>
</tr>
<tr>
<td>(def) (7.8262)</td>
<td>(10.1584)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Cons. = 48.4200</td>
<td>+0.0248 log U</td>
<td>0.8499 126.58 1.8909</td>
<td></td>
</tr>
<tr>
<td>(def) (5.7450)</td>
<td>(11.2508)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Log Cons. = 50.3976</td>
<td>+0.0086 log T</td>
<td>0.8419 119.14 1.8781</td>
<td></td>
</tr>
<tr>
<td>(def) (6.1163)</td>
<td>(10.9149)</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Figures within brackets are 't' values, significant at 1% level.
Table 5.6 B

Multiple Regression Results relating to Impact of Taxation on Price Level.

<table>
<thead>
<tr>
<th>Dependent Intercept Variable</th>
<th>Explanatory Variables</th>
</tr>
</thead>
<tbody>
<tr>
<td>Log Pw = 63.9984 + 0.2593 Log F + 0.0441 Log U + 0.0917 Log Ti</td>
<td></td>
</tr>
<tr>
<td>(1.2632) (0.5552) (2.0592) (3.1806)</td>
<td></td>
</tr>
<tr>
<td>Log Pw = 46.7035 - 0.0783 Log F - + 0.0289 Log ST</td>
<td></td>
</tr>
<tr>
<td>(0.7526) (-0.1310) (0.4350)</td>
<td></td>
</tr>
<tr>
<td>Log Pw = 112.3103 - 0.2518 Log F + 0.0479 Log U</td>
<td></td>
</tr>
<tr>
<td>(1.3326) (-0.4528) (1.7655)</td>
<td></td>
</tr>
<tr>
<td>Log Pw = 11.3595 + 0.4415 Log F + 0.0949 Log Ti</td>
<td></td>
</tr>
<tr>
<td>(0.2355) (0.8735) (2.9922)</td>
<td></td>
</tr>
</tbody>
</table>

Impact of Taxation on Price Level

<table>
<thead>
<tr>
<th>I</th>
<th>E</th>
<th>M</th>
<th>D</th>
</tr>
</thead>
<tbody>
<tr>
<td>+0.002 Log I -0.0463 Log E -0.0075 Log M +0.0493 Log D 0.9807 161.17</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.0365) (-2.2864) (-2.9614) (0.1343)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+0.0055 Log I + 0.0157 Log E -0.0043 Log M +0.3401 Log D 0.9631 96.77</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.4350) (0.6740) (-1.0782) (0.5953)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>+0.0071 Log I + 0.0126 Log E -0.0055 Log M -0.1901 Log D 0.9690 115.90</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(0.9678) (1.2128) (-1.5025) (-0.4177)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-0.0040 Log I -0.0392 Log E -0.0067 Log M 0.3995 Log D 0.9766 154.05</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(-0.1500) (-1.7848) (-2.0849) (1.1149)</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Summary Statistics</th>
</tr>
</thead>
<tbody>
<tr>
<td>F-Value</td>
</tr>
<tr>
<td>0.9807 161.17</td>
</tr>
<tr>
<td>0.9631 96.77</td>
</tr>
<tr>
<td>0.9690 115.90</td>
</tr>
<tr>
<td>0.9766 154.05</td>
</tr>
</tbody>
</table>

It may be observed that in almost all cases, taxation had positive impact on the wholesale price index when tested along with other explanatory variables, as also separately. Thimmaiah has tested the impact of indirect taxes separately and
within indirect taxes, he has tested the effect of sales tax and union excise duties separately. In all cases he has found positive influence of taxation on wholesale price index, the GNP deflator, and the consumer price deflator. Though the values of regression coefficients are not so high, the 't' values of these regression coefficients are significant. These results would undoubtedly support the view that taxation in general and indirect taxes in particular have had destabilising effect on prices in India.

Another study on the effect of taxation made by Inu Jain (1988) reveals that the effect of heavy excise duties has been the tax-pushed inflation in India. The most striking characteristics of excise taxation in India are the double and multiple taxation of commodities and the cascading effect of various indirect taxes, such as, customs, excise, sales tax and octroi which result in highly inflated prices of the consumers.

Sanjoy Agarwal (1991) observes that "The government and the public sector can also be held responsible, to a large extent, for pushing up the price level in the country. With every budget, the government imposed fresh commodity taxes and gave an opportunity to the trading classes to raise the prices, often more than the levy of taxes. The public sector enterprises too were continuously raising prices of their products and services which generally constitutes raw materials for other industries. A good example is the Railways which raised fares and freight rates during last three years. Likewise, there has been regular upward revision of several administered prices, such as those of steel, cement, coal etc., pushing up the price level further. Un-
economic pricing policies in the public sector and in the high priority industries result in erosion of resources for further investment, and sometimes lead to malpractices by unscrupulous traders. Necessary price adjustments have been made since 1980 with a view to ensuing viable operations and generating additional resources. But every rise in the administered prices adds fuel to the fire of inflationary potential in the country." [CPP. 33-34].

Inspite of the aforementioned inflationary impact of taxation some economists view that taxes can also serve as an economic stabilizer. During deflation, taxation may be reduced by the government to create incentive effects. During inflation, direct taxes may be increased to take away excessive purchasing power from the public. This will reduce effective demand pressure and cause prices to fall, thereby to check inflation. However, in Indian context direct tax constitutes only 20 per cent of the total tax revenue, the remaining 80 percent of the total tax revenue is contributed by indirect taxes. As such inflation dampening effect of direct taxes is insignificant in comparison to the inflation accelerating effect of indirect taxes.

5.6.2. External Assistance: Impact on Price-Level:

In a developing economy domestic sources of financing economic development fall short of the huge financial requirements for rapid economic development. So external sources of finance have become essential for the developing economy. The countries which are giving assistance today had themselves received the same earlier. As Prof. Lewis (1955) has said, "Nearly every developed state has had the assistance of foreign finance to supplement its own meagre savings during the early stages of its development."
England borrowed from Holland in the 17th and 18th centuries and in turn came to lend to almost every other country in the world in the 19th and 20th centuries. The United States of America, now the richest country in the world, borrowed heavily in the 19th century and is in turn called upon to become the major lender of the 20th century." [P.2.44].

It may be recalled that inspite of its necessity, foreign assistance is a subordinate source of financing development in a developing economy. Foreign assistance as percentage of development expenditure should go on diminishing, as the developing nations must learn gradually to become self reliant.

Broadly there are two types of capital inflows in a developing country viz., private foreign investment and official loans and grants. Official sources are again of two types of loans and grants—bilateral and multilateral. Bilateral loans and grants are inter-governmental, that is, on government to government basis. Multilateral loans and grants are those that are advanced to developing countries by international agencies.

So far as our study is concerned, by foreign assistance we mean foreign assistance in the form of loans and grants both on government to government basis and from international financial institutions and P.L. 480/665 assistance. These loans and grants are mainly utilized by the public sector, only a small part is available to the private sector.

Foreign assistance to India comes in three forms: Loans, grants and P.L. 480/665 assistance. PL 480/665 assistance was in the form of food aid which India received from U.S.A., but
as foodgrains production improved, this assistance declined in importance and no aid in this form was received after 1977-78. Upto the Fourth Plan, loans accounted for 72 per cent, grants for about 6 per cent and PL 480/665 assistance for about 22 per cent of the total external assistance. The severe draughts of 1965-66 and 1966-67 compelled India to take PL 480 food assistance on a massive scale. During the Fourth Plan as the Green Revolution gathered momentum, PL 480 was slashed down to just 9 per cent of the total assistance. During the first four years of the Fifth Plan, a total assistance of Rs. 6,044 crores at current prices were utilised and out of this, 82 per cent accounted for as loans, 15 per cent as grants and just 3 per cent as PL 480/665 assistance. During the Sixth Plan, loans accounted for nearly 84 per cent of the total external assistance, the share of grants got reduced to about 16 per cent. In absolute terms, external assistance of the order of Rs. 10,903 crores at current prices was utilised. It may be recalled that whereas the annual average utilisation of external assistance (at current prices) during the first four years of the Fifth Plan was of order of Rs. 1,511 crores, it increased to Rs. 2,180 crores during the Sixth Plan. During the Seventh Plan, annual average inflow of external assistance shot up to Rs. 4,540 crores at current prices. Thus it appears that India is unable to reduce its reliance on foreign assistance, rather it is increasing enormously in absolute terms.

When the rate of investment is sought to be raised with the help of external resources, an upward pressure on the prices of wage goods will be inevitable on account of time lags between investment and emergence of output unless import covers both investment goods and type of wage goods that would be in demand. Unless accompanied by sufficient imports, forcing the rate of
investment above the voluntary rate of savings, would inevitably result in inflation if a comprehensive system of physical controls and rationed distributions are not enforced.

It is worth mentioning that in case of EA (External Assistance), its actual impact on inflation cannot be ascertained unless we know the purpose for which EA is used. In our study we have been constrained by the lack of such detailed data of EA relating to purpose for which it is used. However, we could get the aggregate effect of EA on inflation for which the actual position may be obscured.

5.6.3 Deficit Financing-Impact on Price-Level:

There always exists a gap between planned investment expenditure and income of the government of India from domestic savings in the form of taxation, surplus from public enterprises and internal end external borrowings. The technique of filling this gap is termed as deficit financing. "Deficit financing as understood in India, refers to the financing of the plan outlay through additional money created by the Reserve Bank of India by extending loans to the government to fill the gap between the fiscal outlay and the total receipts, which include domestic savings, market borrowings, external loans and surplus of the public enterprises. According to the Reserve Bank of India Act, there is no limitations on borrowings by the Government of India." [Manker, 1990 P. 246]

In the First Five Year Plan of India the term 'deficit financing' has been defined as "the direct addition to gross
national expenditure through budget deficits, whether the deficits are on revenue or on capital account. The essence of such a policy lies, therefore, in government spending in excess of the revenue it receives in the shape of taxes, earnings of the state enterprises, loans from the public, deposits and funds and other miscellaneous sources. The government may cover the deficit either by running down its accumulated balances or borrowing from the banking system (mainly from the central Bank of the country) and thus creating money." [Government of India : The First Five-Year Plan, PP.59-60]

Deficit financing in India has been mainly adopted to enable the government to obtain necessary resources for the Five-Year Plans. The levels of outlay laid down are of an order which cannot be met by taxation and borrowing from the public. The gap in resources is made up partly through external assistance but when external assistance is not enough to fill the gap, deficit financing has to be undertaken. The targets of production and employment in the plans are fixed primarily with reference to what is considered as the desirable rate of growth for the economy. When these targets cannot be achieved through resource obtainable from taxation and borrowing additional resources then the government resort to deficit financing.

Keynes propounded his compensatory fiscal policy which was nothing but the technique of deficit financing or deficit spending as applied to counteract the effects of depression and initiate a process of recovery. Deficit spending by the government during depression helps to start the stagnant wheels of productive machinery and thus promotes prosperity. Due to deficiency of effective demand, resources remain idle during depression which
can be engaged productively by increased government spending through deficit financing. There results an increase in production, employment and income and through the multiplier effect, the economy will be lifted up from the slump levels. That is why Keynes suggested that government should start new public works through deficit financing in times of depression.

The impact of the use of deficit financing in a developing economy is inflationary because though a developing economy has unemployed or idle labour (mostly of unskilled nature) there is a shortage of all the other complementary resources, in the absence of which the idle labour cannot be employed and output cannot be increased. Due to the inelastic nature of output the use of deficit financing in a developing country raises only monetary incomes, total demand and prices. According to Rao (1952) the multiplier principle may not work in the simple fashion visualised by Keynes for advanced countries. Rather it will enhance the pace of inflation in developing economies.

During the early years of the Five-Year Plan experience, deficit financing as a means of financing government investment to create productive capacity was vehemently defended. This argument was based on the assumption that all the funds available through the mechanism of deficit financing were invested to create productive capital assets. "In recent years, the central government has started openly defending and using deficit financing as a source of financing revenue account deficit. The justification for this recent fiscal strategy is that the growth of output particularly foodgrains output has been able to absorb the money supply created under deficit financing, thereby
preventing a rise in prices." [Thimmaiah, 1986, PP. 182-83] But several empirical studies including the one made by Mongia (1980) have shown the close and direct association between deficit financing and price level in the country.

One of the crucial questions which is often posed is whether inflation in our country, has been a monetary phenomenon or not. The monetarist school of thought represented by economists like the late Prof. C.N. Vakil and Prof. P.R. Brahmananda strongly believe that it is the excessive growth in money supply arising out of deficit financing which has been a major cause of inflation in the past. On the other hand, there are a number of eminent economists who have expressed different opinions on the subject. Dr. K.S. Krishnaswamy, in his address on 'Thought on Inflation and Distribution to the Indian Economic Association in December 1976, as Deputy Governor, Reserve Bank of India, expressed the view that "inflation ......... is not so much a monetary but a social phenomenon; and the nemesis has to be sought at a fundamental level, that is, in changes reflected in socio-economic structure." The view has been supported by Dr. I. G. Patel, former Governor, Reserve Bank of India, in his inaugural address to the Indian Economic Association at Madras in December, 1977. He observed that, "In the ultimate analysis inflation is not a monetary but a social and political phenomenon, monetary trend being only a reflection of our success or failure in achieving a stable or acceptable scheme of distribution of income and resources".
There may be disagreement with the monetarists' approach to the problem of inflation but several empirical studies including the ones mentioned above have established a close positive relationship between the rate of increase in prices and the rate of growth in money supply. It is observed that prices have soared to new heights at every successive dose of deficit financing. Although the inflation in our country has not been solely due to expansion in money supply, yet a disproportionate expansion in money supply in relation to the supply of goods has been primarily responsible for the "new" inflation generated in the economy during the later part of development planning.

Prof. Milton Friedman (1963) contends that there exists a high positive relationship between rise in prices and rise in the stock of money. This is reflected in his following emphatic statement:

"I know no exception to the proposition that there has been one-to-one relationship between the substantial rise in prices and substantial rise in the stock of money. I have challenged people to cite exception. I have as yet found no exception." [P. 103]


We now study the impact of filling the S-I gap by the three instruments, namely, (a) Additional Resource Mobilisation, (b) External Assistance and (c) Deficit Financing on inflation in the context of planning in India. Our study covers the period from 1951-52 to 1989-90. We collect data relating to investment (I),
additional resource mobilisation (ARM), external assistance (EA) and deficit financing (DF) from various sources which are mentioned below the table 5.4 above. We estimate domestic savings at the pre-plan year rates of taxes, tariffs and administered prices (S) by using the following formula:

\[ S = I - \text{ARM} - \text{EA} - \text{DF} \]

Most of the data as found in various documents pertaining to I, ARM, EA and DF of various plan periods relate to the pre-plan year prices. We have expressed the data at pre-plan year prices in terms of both 1970-71 prices and 1980-81 prices and the data have been displayed in Table 5.4 above.

In order to study the impact of ARM, EA and DF as S-I gap-filling instruments on inflation we take their planwise annual average values. We could not take the actual plan figures because of the Three Annual Plans 1966-69 and the Annual Plan 1979-80. Again because of the non-availability of year-wise figures of ARM, EA and DF for the entire period from 1951-52 to 1989-90, we have devised to study the impact of the above S-I gap-filling instruments on inflation (measured by WPI) on the basis of the planwise annual average figures. Tables 5.7. and 5.8. below display respectively the planwise annual average of WPI, ARM, EA and DF at 1980-81 prices and at current prices. Planwise annual average figures of ARM, EA and DF are estimated from the table 5.4 above. Wholesale price indices with 1980-81 as base are obtained from the wholesale price indices with 1981-82 = 100 (Table 15.6, CMIE Vol 1, August 1992) by conversion procedure.
Since we could obtain the yearwise figures of ARM, EA and DR for the period 1980-81 to 1989-90, as such we have decided to make an empirical study also on the basis of the yearwise figures of the eighties. Tables 5.9 and 5.10 incorporate the yearwise figures of ARM, EA and DF for the period 1980-81 to 1989-90 at 1980-81 prices and at current prices.

It is obvious that the picture relating to inflation would be much clear if ARM could be decomposed into its various components viz; additional direct taxes, additional indirect taxes and additional contribution of public sector enterprises resulting from the raising of administered prices. But data in such form are not available. However, we could obtain the yearwise additional direct and indirect taxes for the period 1951-52 to 1989-90 resulting from both horizontal and vertical expansion of tax base. (Source: Indian Economic Statistics - Public Finance, G.O.I., Ministry of Finance, 1991). Hence in order to study the relative impact of ADT (additional direct taxes) and AIT (additional indirect taxes) on inflation we have also fitted multiple regression models with ADT, AIT, EA and DF as the explanatory variables. The planwise annual average figures and yearwise figures for the period 1980-81 to 1989-90 of ADT and AIT at 1980-81 price have been displayed in table 5.11.
Table 5.7

Planwise Annual Average of WPI, (1980-81 = 100) Additional Resource Mobilisation (ARM), External Assistance (EA) and Deficit Financing (DF) with 1980-81 = 100

<table>
<thead>
<tr>
<th>Plan Period</th>
<th>WPI (In crores of Rs.)</th>
<th>ARM (In crores of Rs.)</th>
<th>EA (In crores of Rs.)</th>
<th>DF (In crores of Rs.)</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Plan</td>
<td>17.4</td>
<td>276</td>
<td>238</td>
<td>360</td>
</tr>
<tr>
<td>Second Plan</td>
<td>19.5</td>
<td>1327</td>
<td>1161</td>
<td>1203</td>
</tr>
<tr>
<td>Third Plan</td>
<td>24.4</td>
<td>2501</td>
<td>1834</td>
<td>1058</td>
</tr>
<tr>
<td>Annual Plans (1966-69)</td>
<td>34.5</td>
<td>1074</td>
<td>2749</td>
<td>798</td>
</tr>
<tr>
<td>Fourth plan</td>
<td>43.2</td>
<td>2412</td>
<td>2119</td>
<td>1161</td>
</tr>
<tr>
<td>Fifth Plan</td>
<td>69.6</td>
<td>3794</td>
<td>2145</td>
<td>1311</td>
</tr>
<tr>
<td>Annual Plan (1979-80)</td>
<td>84.5</td>
<td>2089</td>
<td>1577</td>
<td>1876</td>
</tr>
<tr>
<td>Sixth Plan</td>
<td>117.4</td>
<td>7792</td>
<td>1902</td>
<td>2732</td>
</tr>
<tr>
<td>Seventh Plan</td>
<td>160.5</td>
<td>3805</td>
<td>2827</td>
<td>5861</td>
</tr>
</tbody>
</table>

Source: (i) WPI: Wholesale price indices with 1981-82=100 are taken from Basic Statistics Relating to Indian Economy, CMIE, Vol I, August 1992. These figures have been converted into 1980-81 as base and then planwise annual averages are taken.

(ii) ARM, EA and DF: Obtained from table 5.4.
### Table 5.8

Planwise annual Average of WPI (1970-71 =100), Additional Resource Mobilisation (ARM), External Assistance (EA) and Deficit Financing (DF), at current prices (Rs. in crores)

<table>
<thead>
<tr>
<th>Plan Period</th>
<th>WPI</th>
<th>ARM</th>
<th>EA</th>
<th>DF</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Plan</td>
<td>44.9</td>
<td>51.0</td>
<td>44.4</td>
<td>66.6</td>
</tr>
<tr>
<td>(1951-56)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Second Plan</td>
<td>50.2</td>
<td>210.4</td>
<td>184.2</td>
<td>190.8</td>
</tr>
<tr>
<td>(1956-61)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Third Plan</td>
<td>62.7</td>
<td>578.4</td>
<td>392.6</td>
<td>226.6</td>
</tr>
<tr>
<td>(1961-66)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Plans</td>
<td>88.8</td>
<td>303.3</td>
<td>776.7</td>
<td>225.3</td>
</tr>
<tr>
<td>(1966-69)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fourth Plan</td>
<td>111.3</td>
<td>856.0</td>
<td>752.0</td>
<td>412.0</td>
</tr>
<tr>
<td>(1969-74)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fifth Plan</td>
<td>179.2</td>
<td>2060.0</td>
<td>1164.4</td>
<td>712.0</td>
</tr>
<tr>
<td>(1974-79)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Annual Plan</td>
<td>217.6</td>
<td>1509.0</td>
<td>1139.0</td>
<td>1355.0</td>
</tr>
<tr>
<td>(1979-80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sixth Plan</td>
<td>296.3</td>
<td>6594.0</td>
<td>2180.8</td>
<td>2567.0</td>
</tr>
<tr>
<td>(1980-85)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seventh Plan</td>
<td>410.0</td>
<td>5004.6</td>
<td>4540.0</td>
<td>7709.0</td>
</tr>
<tr>
<td>(1985-90)</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: (i) WPI: Obtained from table 3.4. of chapter III  
(ii) ARM, EA and DF: Obtained from table 5.4. Reference:  
'Note' below the table 5.4.
Table 5.9

Yearwise WPI (1980-81=100), Additional Resource Mobilisation (ARM), External Assistance (EA) and Deficit Financing (DF) at 1980-81 prices for the period 1980-81 to 1989-90 [Rs. in crores]

<table>
<thead>
<tr>
<th>Year</th>
<th>WPI</th>
<th>ARM</th>
<th>EA</th>
<th>DF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-81</td>
<td>100</td>
<td>926</td>
<td>2161</td>
<td>4081</td>
</tr>
<tr>
<td>1981-82</td>
<td>111.2</td>
<td>3814</td>
<td>1706</td>
<td>2987</td>
</tr>
<tr>
<td>1982-83</td>
<td>116.7</td>
<td>5996</td>
<td>2007</td>
<td>2776</td>
</tr>
<tr>
<td>1983-84</td>
<td>125.5</td>
<td>7859</td>
<td>1845</td>
<td>2807</td>
</tr>
<tr>
<td>1984-85</td>
<td>133.6</td>
<td>9312</td>
<td>1793</td>
<td>2367</td>
</tr>
<tr>
<td>1985-86</td>
<td>139.5</td>
<td>1066</td>
<td>2112</td>
<td>3414</td>
</tr>
<tr>
<td>1986-87</td>
<td>147.6</td>
<td>1885</td>
<td>2462</td>
<td>6299</td>
</tr>
<tr>
<td>1987-88</td>
<td>159.7</td>
<td>2366</td>
<td>3206</td>
<td>4624</td>
</tr>
<tr>
<td>1988-89</td>
<td>171.6</td>
<td>4083</td>
<td>3134</td>
<td>6036</td>
</tr>
<tr>
<td>1989-90</td>
<td>184.3</td>
<td>4865</td>
<td>4366</td>
<td>8933</td>
</tr>
</tbody>
</table>

Source: (i) WPI: As mentioned below the table 5.7
(iii) EA: Economic Survey, G.O.I., 1990-91. Figures have been converted to 1980-81 as base.
(iv) DF: Same as in ARM. Figures have been converted to 1980-81 as base.

N.B. Figures at current prices are converted to the figures at (1980-81) prices on the basis of the table 3.4 of chapter III.
Table 5.10

Yearwise WPI (1970-71 = 100), Additional Resource Mobilization (ARM), External Assistance (EA) and Deficit Financing (DF) at current prices for the period 1980-81 to 1989-90. [Rs. in crores]

<table>
<thead>
<tr>
<th>Year</th>
<th>WPI</th>
<th>ARM</th>
<th>EA</th>
<th>DF</th>
</tr>
</thead>
<tbody>
<tr>
<td>1980-81</td>
<td>257.3</td>
<td>926</td>
<td>2,162</td>
<td>3,451</td>
</tr>
<tr>
<td>1981-82</td>
<td>281.3</td>
<td>4,170</td>
<td>1,865</td>
<td>2,519</td>
</tr>
<tr>
<td>1982-83</td>
<td>288.7</td>
<td>6,728</td>
<td>2,252</td>
<td>2,350</td>
</tr>
<tr>
<td>1983-84</td>
<td>316.0</td>
<td>9,652</td>
<td>2,266</td>
<td>2,512</td>
</tr>
<tr>
<td>1984-85</td>
<td>338.4</td>
<td>12,247</td>
<td>2,359</td>
<td>2,003</td>
</tr>
<tr>
<td>1985-86</td>
<td>357.8</td>
<td>1,482</td>
<td>2,936</td>
<td>4,490</td>
</tr>
<tr>
<td>1986-87</td>
<td>376.8</td>
<td>2,761</td>
<td>3,605</td>
<td>8,285</td>
</tr>
<tr>
<td>1987-88</td>
<td>405.3</td>
<td>4,904</td>
<td>5,052</td>
<td>6,080</td>
</tr>
<tr>
<td>1988-89</td>
<td>435.3</td>
<td>6,908</td>
<td>5,304</td>
<td>7,940</td>
</tr>
<tr>
<td>1989-90</td>
<td>474.3</td>
<td>8,968</td>
<td>5,803</td>
<td>11,750</td>
</tr>
</tbody>
</table>

Source: (i) WPI: Table 3.4 of chapter III
(ii) ARM, EA and DF: As mentioned below the table 5.9.

N.B. While the ARM Figure relating to the Sixth Plan at current price is taken from RBI Report on Currency and Finance, 1990-91, Vol II, Page 124-125, the yearwise figures of ARM corresponding to the Sixth Plan are taken from Indian Economic Statistics: Public Finance, Government of India, Ministry of Finance, December 1984.
Table 5.11

Planwise Annual Average Figures and Yearwise Figures (from 1980-81 to 1989-90) of Additional Direct Taxes (ADT) and additional Indirect Taxes (IDT) at 1980-81 prices.

<table>
<thead>
<tr>
<th>Plan Period</th>
<th>Annual Average of ADT</th>
<th>Annual Average of AIT</th>
<th>Year</th>
<th>ADT</th>
<th>AIT</th>
</tr>
</thead>
<tbody>
<tr>
<td>First Plan</td>
<td>5.6</td>
<td>22.6</td>
<td>1980-81</td>
<td>172.0</td>
<td>1989.0</td>
</tr>
<tr>
<td>Second Plan</td>
<td>28.6</td>
<td>87.8</td>
<td>1981-82</td>
<td>791.0</td>
<td>3140.1</td>
</tr>
<tr>
<td>Third Plan</td>
<td>66.4</td>
<td>248.0</td>
<td>1982-83</td>
<td>320.0</td>
<td>2442.9</td>
</tr>
<tr>
<td>Annual Plans</td>
<td></td>
<td></td>
<td>(1966-69)</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>35.3</td>
<td>243.7</td>
<td>1983-84</td>
<td>337.9</td>
<td>3149.5</td>
</tr>
<tr>
<td>Fourth Plan</td>
<td>142.4</td>
<td>584.0</td>
<td>1984-85</td>
<td>321.6</td>
<td>2939.5</td>
</tr>
<tr>
<td>Fifth Plan</td>
<td>259.8</td>
<td>1366.0</td>
<td>1985-86</td>
<td>663.0</td>
<td>4696.6</td>
</tr>
<tr>
<td>Annual Plan</td>
<td>245</td>
<td>1910.0</td>
<td>1986-87</td>
<td>435.0</td>
<td>3842.2</td>
</tr>
<tr>
<td>(1979-80)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sixth Plan</td>
<td>446.8</td>
<td>3179.0</td>
<td>1987-88</td>
<td>377.0</td>
<td>4344.4</td>
</tr>
<tr>
<td>Seventh Plan</td>
<td>1167.0</td>
<td>7208.8</td>
<td>1988-89</td>
<td>1344.0</td>
<td>4536.0</td>
</tr>
</tbody>
</table>


N.B. ADT and AIT at current prices corresponding to a particular year resulting from the expansion of horizontal and vertical tax base have been obtained by subtracting the figures of DT (direct tax) and IT (indirect tax) of the immediately preceding year from the corresponding figures of the year under consideration. The figures at current prices have been expressed in 1980-81 prices. However, ADT and AIT obtained by subtracting the DT and IT figures of the preceding year from the corresponding figures of
that year are usually having upward bias because of continuous increase in WPI figures excepting the First Plan period and the years 1968-69, 1975-76 and 1977-78.

5.7.1 Econometric Tools for Analysing the Implications of S-I Gap on Inflation.

A. Multiple Linear Regression Model: In order to study the impact of Additional Resource Mobilisation (ARM), External Assistance (EA) and Deficit Financing (DF) as S-I gap filling instruments on Inflation we use the following multiple regression model:

$$WPI = \alpha_0 + \alpha_1 I_{FARM} + \alpha_2 I_{FEA} + \alpha_3 I_{FDF} + U \cdots (1)$$

Where

$\alpha_1, \alpha_2$ and $\alpha_3$ are parameters to be estimated.

$U$ = Stochastic disturbance term

This model, for convenience, may be put in the following form:

$$Y = \alpha_0 + \alpha_1 X_1 + \alpha_2 X_2 + \alpha_3 X_3 + U \cdots (2)$$

where, $Y = WPI$

$X_1 = I_{FARM}$

$X_2 = I_{FEA}$

$X_3 = I_{FDF}$

$i$ = ith observation.
The equations (2) for \(i=1,2, \ldots\) can be put in the following matrix form:

\[ Y = X\alpha + U \]  \hspace{1cm} (3)

The least squares solution yields

\[ \hat{\alpha} = (X'X)^{-1}X'Y \]  \hspace{1cm} (4)

\[ R^2 = \frac{\hat{\alpha}'X'Y - n\overline{Y}^2}{Y'Y - n\overline{Y}^2} \]  \hspace{1cm} (5)

\(n\) being the number of observations.

\[ \text{Var} (\hat{\alpha}) = \sigma^2_u (X'X)^{-1} \]  \hspace{1cm} (6)

Where an unbiased estimator \(\hat{\sigma}^2_u\) of \(\sigma^2_u\) is given by

\[ \hat{\sigma}^2_u = \frac{\sum e_i^2}{n-k} \]  \hspace{1cm} (7)

\[ e_i = Y_i - \hat{Y}_i \]

\(K = \text{Number of parameters to be estimated.}\)

\[ \text{S.E.} (\hat{\alpha}) = \sqrt{\text{Var} (\hat{\alpha})} \]  \hspace{1cm} (8)

The \(t\)-statistic is defined by

\[ t^* = \frac{\hat{\alpha}}{\text{S.E.} (\hat{\alpha})} \]  \hspace{1cm} (9)

Which follows \(t\) - distribution with \((n-k)\) degrees of freedom (d.f.).

We may recall that the \(t\) - statistic measures the significance of an individual coefficient; in contrast the coefficient of determination \(R^2\), measures the degree to which the
estimated relationship (which involves all the coefficients),
picks up the variability in the dependent variable.

B. Simple Linear Regression Model: To study the individual impact of Additional Resource Mobilisation (ARM), External Assistance (EA) and Deficit Financing (DF) as S-1 gap filling instruments on inflation we use the following simple linear regression model:

\[ y_i = \alpha_0 + \alpha_1 x_i + u_i \quad (i=1,2, ..., n) \quad ... \quad (10) \]

Where \( y = \text{WPI} \)

\[ x = \begin{cases} \text{FARM} & \text{or} \quad \text{FEA} \quad \text{or} \quad \text{DF} \\ \end{cases} \]

\( u = \text{Stochastic disturbance term} \)

\( i = \text{ith observation} \)

The least squares solution yields:

\[ \hat{\alpha}_1 = \frac{\sum x_i d_i}{\sum x_i^2} \quad \cdots \quad (11) \]

Where \( x = \bar{x}_i - \bar{x}, \quad d_i = y_i - \bar{y} \)

\[ \hat{\alpha}_0 = \bar{y} - \hat{\alpha}_1 \bar{x} \quad \cdots \quad (12) \]

S.E. (\( \hat{\alpha}_1 \)) = \( \sqrt{\text{Var} (\hat{\alpha}_1)} = \frac{\hat{\sigma}_u}{\sqrt{n}} \left( \frac{\sum x_i^2}{\sum x_i^2} \right) \quad \cdots \quad (13) \]

Where \( \hat{\sigma}_u = \frac{\sum e_i^2}{n-2} \), \( e_i = y_i - \hat{y}_i \)

\[ \hat{\lambda} = \frac{\hat{\alpha}_1 (\sum x_i^2)}{\sum d_i^2} \quad \cdots \quad \cdots \quad (14) \]
The t-statistic is defined by
\[ t = \frac{\hat{\beta}_i}{\text{S.E.} (\hat{\beta}_i)} \]  

Which follows t-distribution with (n-2) degrees of freedom.

5.7.2. Regression Results and Their Interpretations:

A. Multiple Regression Results:

We present below the estimated regression results when our multiple and simple linear regression models are fitted with the data embodied in the tables 5.7, 5.8, 5.9 and 5.10.

At Constant Prices (1980-81 Prices)

(a) Impact of ARM(X_1), EA(X_2), and DE(X_3) on Inflation Planwise (Table 5.7):

\[ Y = 0.317635 + 0.006715 X_1 + 0.001499 X_2 + 0.0022613 X_3 \]

\[ \text{S.E. (} \hat{\beta}_i \text{)} : (0.002312) (0.009306) (0.004827) \]

\[ \text{t} : (2.079) (0.1645) (4.691) \]

\[ R^2 = 0.72 \]

No. of observations = 9

Degrees of Freedom = 5
(b) Impact of $\ln(X_1), \ln(X_2), \ln(X_3)$ on Inflation: Yearwise
for the Period 1980-81 to 1989-90 (Table 5.73)

\[ Y = 60.75990 + 0.001856 X_1 + 0.025262 X_2 + 0.003812 X_3 \]

C.E. ($\alpha_i$): (0.002033) (0.010373) (0.004229)

\[ t: \quad 1.913 \quad 2.453 \quad 2.668 \]

\[ R^2 = 0.77 \]

No. of observations = 10
Degrees of Freedom = 6

(c) Impact of $\ln(X_1), \ln(X_2), \ln(X_3)$, and AT$(X_4)$ on Inflation:
Planwise.

\[ Y = 33.51974 + 0.008669 X_1 + 0.050233 X_2 + 0.206004 X_3 + 0.067472 X_4 \]

S.E. ($\alpha_i$): (0.006601) (0.017328) (0.112866) (0.012258)

\[ t: \quad 1.313 \quad 2.897 \quad (-1.717) \quad 3.488 \]

\[ R^2 = 0.77 \]

No. of observations = 3
Degrees of Freedom = 4
(d) Impact of $EA(X_1)$, $DF(X_2)$, $ADT(X_3)$ and $ALT(X_4)$ on Inflation; Yearwise for the Period 1980-81 to 1989-90.

\[ Y = 49.12934 + 0.015774X_1 + 0.012523X_2 + 0.003531X_3 + 0.016413X_4 \]

S.E. ($\Delta_1$): (0.011958) (0.004468) (0.014364) (0.006336)

\[ t^* : \quad \text{N.S}\quad + + \quad \text{N.S}\quad + + \]

\[ R^2 = 0.90 \]
No. of observations = 10
Degrees of freedom = 5

N.B: (i) + implies significant at 1% level of significance (i.e.; highly significant)
(ii) + + implies significant at 5% level of significance.
(iii) N.S. implies not significant.

At Current Prices

(a) Impact of $ARM(X_1)$, $EA(X_2)$, and $DF(X_3)$ on Inflation; Planwise

[Table 5.8.1]

\[ Y = 33.35016 + 0.020380X_1 + 0.09167X_2 + 0.052815X_3 \]

S.E. ($\Delta_1$): (0.007044) (0.031664) (0.017297)

\[ t^* : \quad + + \quad + + \quad + + \]

\[ R^2 = 0.96 \]
No. of observations = 9
Degrees of freedom = 5

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(b) **Impact of ARM(\(X_1\)), EA(\(X_2\)) and DF(\(X_3\)) on Inflation Yearwise for the Period 1980-81 to 1989-90 [Table 5.10]**

\[
Y = 188.1129 + 0.004302 X_1 + 0.030035 X_2 + 0.007840 X_3
\]

\[
S.E. (\hat{\beta}_i) = (0.002263) (0.010568) (0.002419)
\]

\[
t^* : (1.902) (2.842) (3.241)
\]

\[
R^2 = 0.94
\]

No. of observations = 10
Degrees of Freedom = 6

**N.B:**
(i) + implies significant at 1\% level of significance
    (i.e.; highly significant)
(ii) ++ implies significant at 5\% level of significance
(iii) N.S. implies not significant.

**B. Simple Regression Results:**

At Constant Prices, (1980-81 Prices)

(i) **Impact of ARM(\(X_1\)) on Inflation Planwise [Table 5.7]:**

\[
Y = 20.18574 + 0.015529 X_1
\]

\[
S.E. (\hat{\beta}_1) = (0.00694)
\]

\[
t^* = (2.548)
\]

\[
R^2 = 0.48
\]

No. of observations = 9
Degrees of freedom = 7

205
(ii) Impact of $EAX_2$ on Inflation & Planwise [Table 5.7]

$$Y = 2.758687 + 0.032997X_2$$

S.E. ($\alpha_1$): 

$$t = \frac{\alpha_1}{S.E.(\alpha_1)} = \frac{0.019938}{(0.019938)} = 1.00$$

$$r^2 = 0.28$$

No. of observations = 9
Degrees of Freedom = 7

(iii) Impact of $DFX_3$ on Inflation & Planwise [Table 5.7]

$$Y = 13.32356 + 0.027572X_3$$

S.E. ($\alpha_2$): 

$$t = \frac{\alpha_2}{S.E.(\alpha_2)} = \frac{0.004350}{(0.004350)} = 0.99$$

$$r^2 = 0.35$$

No. of observations = 9
Degrees of Freedom = 7
(iv) Impact of AR(1) on Inflation & Yearwise For the Period 1980-81 to 1989-90 [Table 5.9]

\[ Y = 111.5188 - 0.00064X \]

S.E. (\( \alpha \)):

\[ (0.003379) \]

\[ t^* : \quad \text{N.S} \]

\[ R^2 = 0.004 \]

No. of observations = 10
Degrees of Freedom = 8

(v) Impact of CA(2) on Inflation - Yearwise for the Period 1980-81 to 1989-90. [Table 5.9]

\[ Y = 70.43311 + 0.027644X \]

S.E. (\( \alpha \)):

\[ (0.005723) \]

\[ t^* : \quad (4.326) \]

\[ R^2 = 0.74 \]

No. of observations = 10
Degrees of Freedom = 8
(vi) Impact of DF($X_2$) on Inflation \& Yearwise for the Period 1980-81 to 1989-90 (Table 5.9.1)

\[ Y = 93.84491 + 0.010180X^3 \]
\[ \text{S.E. (} \hat{\alpha}_i \text{)}: (0.002850) \]
\[ t^* : (3.572) \]
\[ R^2 = 0.61 \]
No. of observations = 10
Degrees of Freedom = 8

At Current Prices

(i) Impact of ARM($X_1$) on Inflation \& Planwise, (Table 5.8)

\[ Y = 70.80897 + 0.047985X^1 \]
\[ \text{S.E. (} \hat{\alpha}_i \text{)}: (0.009372) \]
\[ t^* : (5.120) \]
\[ R^2 = 0.79 \]
No. of observations = 9
Degrees of Freedom = 7
(ii) **Impact of EN**($X_2$)** on Inflation Planwise.** [Table 5.3]

\[ Y = 44.92252 + 0.108039X^2 \]

S.E. ($\alpha$): (0.013531)

\[ t^2 = (7.985) \]

\[ R^2 = 0.90 \]

No. of observations = 9

Degrees of Freedom = 7

(iii) **Impact of DE**($X_2$)** on Inflation Planwise.** [Table 5.3]

\[ Y = 34.66002 + 0.045129X^2 \]

S.E. ($\alpha$): (0.008574)

\[ t^2 = (5.380) \]

\[ R^2 = 0.30 \]

No. of observations = 9

Degrees of Freedom = 7
(iv) Impact of ARM(X1) on Inflation Yearwise for the Period 1980-81 to 1989-90. (Table 2.10)

\[ Y = 343.0464 + 0.001823 X_1 \]

\[ \text{S.E.}(\beta_1): \ (0.007015) \]

\[ t = \frac{0.001823}{0.007015} \]

\[ \hat{R}^2 = 0.002 \]

No. of observations = 10
Degrees of Freedom = 8

(vi) Impact of EA(X2) on Inflation Yearwise for the Period 1980-81 to 1989-90. (Table 2.10)

\[ Y = 202.0206 + 0.041967 X_2 \]

\[ \text{S.E.}(\beta_1): \ (0.005242) \]

\[ t = \frac{0.041967}{0.005242} \]

\[ \hat{R}^2 = 0.90 \]

No. of observations = 10
Degrees of Freedom = 8
impact of DF($X_3$) on Inflation Yearwise for the Period 1980-81 to 1989-90. [Table 5.10]

\[ Y = 256.4327 + 0.018820 X_3 \]

S.E. ($\sigma^2$): (0.003676)

\[ t^* = 5.120 \]

\[ R^2 = 0.77 \]

No. of observations = 10
Degrees of Freedom = 8

N.B. (i) + implies significant at 1% level of significance (i.e; highly significant)
(ii) ++ implies significant at 5% level of significance
(iii) N.S. implies not significant.

5.7.3. Interpretation of Regression Results:

We observe from the estimated multiple linear regression models at 1980-81 prices [5.7.2.A: (a), (b), (c) and (d)] that during the planning period from 1951-52 to 1989-90, all the three explanatory variables $X_1$, $X_2$ and $X_3$ corresponding to ARM, EA and DF respectively are having positive impact on inflation and they jointly account for 92 percent of the total variations in inflation. The coefficient of $X_3$ corresponding to DF is highly significant (i.e; significant at 1% level), the coefficient of $X_1$ corresponding to ARM is significant at 5% level while the coefficient of $X_2$ corresponding to EA is not significant [Ref: A:(a)]. Again from the estimated model A (c), we observe that
the impact of additional indirect taxes (AIT) which is the major component of ARM is positive and significant at 5% level while the impact of additional direct taxes (ADT) which is also a component of ARM is having negative and insignificant impact on inflation. Hence we observe that the positive and significant impact of ARM on inflation may be attributed to the mobilisation of resources through additional indirect taxes. Our empirical findings support the theoretical reasoning that indirect taxes usually add to price rise whereas direct taxes has the negative impact on prices.

We observe from the estimated simple linear regression equations at planwise constant prices (1980-81 prices) that the simple regression coefficients of $X_1, X_2$ and $X_3$ corresponding to ARM, EA and DF on inflation [Ref: 5.7.2. B:(i),(ii) and (iii)] are in conformity with their corresponding partial regression coefficients in model A (a). We observe from these simple regression models that each of ARM, EA and DF is having positive impact on inflation. While the impact of DF is highly significant that of ARM is significant at 5% level. The impact of EA on inflation is insignificant. Again, individually ARM explains 48 percent of total variations in inflation, While EA explains 28 percent and DF explains 85 percent of total variations in inflation.

The estimated multiple [Ref: 5.7.2 A: (a),(c)] and simple [Ref: 5.7.2 B:(iv),(v),(vi)] regression models based on yearly data at constant prices (1980-81 prices) for the period 1980-81 to 1989-90 yield the following informations:

(i) Each of the explanatory variables ARM, EA and DF is having positive impact on inflation. These variables together explain 78
percent of the total variations in inflation. While the impact of each of the explanatory variables on inflation is positive, the impact of EA and DF are significant of 5% level and that of ARM is not significant. Again the impact of the major component of ARM i.e; additional indirect taxes (AIT) is positive and significant at 5% level while the impact of additional direct taxes (ADT) is although positive yet it is insignificant. This may be due to the fact that in the post 1980-81 period the relative share of ADT in ARM increased in comparison to its share during the entire planning period.

(ii) Coming to the individual impact of ARM, EA and DF we observe that the impact of each of EA and DF on inflation is positive and highly significant. The impact of ARM on inflation is negative but insignificant. Individually, EA and DF explain respectively 74 percent and 61 percent of the total variations in inflation while ARM explains only 0.4 percent of the total variations in inflation. We find that both the multiple and simple regression models yield similar informations. From both kind of models we find that EA and DF are having positive and significant bearing upon inflation while ARM is having no significant impact. However, the impact of additional indirect taxes (AIT), a major component of ARM is found to have positive significant impact on inflation for the obvious reason.

Important observations made in respect of the entire period under study (1951-52 to 1989-90) based on planwise annual average data and in respect of the eighties (1980-81 to 1989-90) based on yearly data are the following:
1. In case of the entire period under study ARM, EA and DF together explain 92 percent of the total variations in inflation. In case of 1980's, ARM, EA and DF together explain about 78 percent of total variations in inflation. This shows that other factors besides the ones incorporated in the models are having more influence on inflation during the eighties in comparison to the entire planning period.

2. When we consider the entire period of our study, we find that ARM and DF are having positive significant bearing upon inflation while the impact of EA on inflation is although positive yet it is not significant. Also we observe that the impact of ADT on inflation is negative and insignificant and that of AIT which is the major component of ARM is positive and significant.

Coming to the eighties we find that while EA and DF are having positive significant bearing upon inflation, ARM does not significantly affect inflation. However, AIT, a component of ARM is found to have positive significant impact on inflation while the influence of ADT, another component of ARM, is having no significant effect on inflation.

We have the lesson from above that the deficit financing (DF) is always vital in accelerating inflation. ARM as a whole and additional indirect taxes (AIT) in particular which is a major component of ARM are having positive, significant effect on inflation so far as the entire period under study is concerned. Although the effect of ARM as a whole became insignificant during the eighties, yet its major component, viz; AIT is having positive and significant effect on inflation. Again, considering the entire period under study, External assistance (EA) is found
to have insignificant impact on inflation while its impact on inflation during the eighties became positive and significant. This may be due to the reason that while in case of both the periods, WPI series is a strictly increasing one, the planwise annual average inflow of EA during the period 1951-52 to 1989-90 is more erratic in nature in comparison with the annual inflow of EA during the eighties.

This is to be mentioned that the regression results corresponding to the entire period under study would have differed a little had the regression models been fitted with yearwise data of ARM, EA and DF for the period 1951-52 to 1989-90. However, due to the unavailability of such yearwise data we were left with no other alternative besides resorting to planwise annual average figures relating to ARM, EA and DF while fitting the regression models.

So far as inflation is concerned the values of the explanatory variables should be taken at constant prices. However, we have estimated the regression models with the current values of the explanatory variables also and the estimated equations have been incorporated in 5.7.2 above.

REFERENCES


