Chapter 1

Introduction

India is a federal country with 28 States and 7 Centrally administered Union Territories. The total government expenditure of both Central and State governments taken together is about 30 per cent of the GDP (in 2005-06) and more than half of it is spent by States. With a structural adjustment programme in 1990-91, government as a part of fiscal reforms for stabilisation tried to control the fiscal deficit and put emphasis on the reduction in subsidies at both levels – Centre and States.

Subsidies, as converse of an indirect tax, constitute an important fiscal instrument for modifying market-determined outcomes. While taxes reduce disposable income, subsidies inject money into circulation. Subsidies affect the economy through the commodity market by lowering the relative price of the subsidised commodity, thereby generating an increase in its demand. With an indirect tax, the price of the taxed commodity increases, and the quantity at which the market for that commodity is cleared, falls, other things remaining the same. Taxes appear on the revenue side of government budgets, and subsidies, on the expenditure side.

Subsidies can have a major impact in augmenting welfare of the society provided these are designed and administered efficiently to serve a clearly stated set of objectives. However, subsidies can also be very costly if they are poorly designed and inefficiently administered. Subsidies in areas such as education, health and environment are advocated on grounds that their benefits are spread well beyond the immediate recipients, and are shared by the population at large, present and future. Subsidies are also used with redistributive objectives, particularly for ensuring minimum consumption levels of food and other basic needs.

In this context, the present study examines the volume of subsidies and its fiscal implications at the State level taking the State of Uttar Pradesh as the case study. The size of Uttar Pradesh government expenditures as a percentage of GSDP taken out to be about 20 per cent in 2005-06. Uttar Pradesh witnessed high fiscal imbalances during 1990s and in early 2000. In this perspective, we would like to analyse the burden of subsidies and fiscal position of the State.
1.1 Subsidies: Definition and Meaning

What is subsidy? This is obviously an important question. How to define a subsidy has been the subject of intensive debate. What is crucial in identifying a subsidy is the choice of benchmark, both in theory and practice. In theory, the benchmark is the situation in which private welfare is maximized, hence prices should equal marginal private costs. Any deviation implies a subsidy. In practice, though, marginal costs can often not be determined any world market prices are commonly used as benchmark for identifying a subsidy.

Subsidies comprise all measures that keeps prices for consumers below market level or keep prices for producers above market level or that reduce cost for consumers and producers by giving direct or indirect support. The term “Subsidy” has been used in the literature in a variety of ways, often implying different meaning and connotations.

The word “Subsidy” is derived from the Latin word “Subsidium”, meaning, “troops stationed in reserve” which implies ‘coming to assistance from behind or indirectly’. The dictionary (Concise Oxford) explains the term as: "Money granted by State, public body, etc., to keep down the prices of commodities, etc." The Joint Economic Committee of the U.S. Congress (1972) had defined Subsidy as government assistance for which no equivalent compensation is received in return, but the assistance is conditioned "on a particular performance by the recipient".

Economists have even thought that the term should be differently defined for different context. Thus, Stephan Barg (1996) has suggested three different definitions for Economic, Fiscal and Environment issues respectively, which are as follows:

**Economic Definition**

"A Government - directed, marketing – distorting intervention which decreases the cost of producing a specific good or service, or increases the price which may be charged for it".

This definition focuses on the use of government’s taxation, expenditure or regulatory power to transfer a benefit from one group to another and how government policies should operate through the market-place, relating the topics
such as improving economic efficiency, reducing unemployment and establishing appropriate policies.

**Fiscal Definition**

"A Government expenditure, provision for exemption from general taxation, or assumption of liability which decreases the cost of producing a specific good or service, or which increases the price which may be charged for it".

This definition focuses transfer from a government to the group or individual receiving the subsidy. It is most relevant when examining specific programmes that are existing or proposed, in order to see who will actually bear the costs or receive the benefits. Many of the commonly-discussed subsidies, or instruments that create subsidies, fall under this definition. Some examples include:

- Cash payments;
- Low interest loans;
- Subsidised services;
- R&D grants to industry;
- government-funded research;
- tax expenditures;
- training assistance;
- assumption of liability (e.g. loan guarantee, site clean up); and
- artificial assignment of liability (e.g. super-fund imposition of joint and several liability)

**Environmental Definition**

"An environmental subsidy consists of the value of uncompensated environmental damaged arising from any flow of goods or services".

It can be seen that environmental subsidies have been defined in the broadest way incorporating any flow of benefits that arise from environmental degradation, even if they are not government – directed, and do not pass through a market mechanism, and reflect direct costs.
For example, harvesting a forest without reforesting, or without recognizing non-timber values, involves an unpaid leading to environmental damage. This amount to subsidization of these harvesters, to the extent of the unpaid cost, by the user of the environment, i.e. the society.

**Other Explanations of Subsidies as Used in Various Studies:**

Mundle, Sudipto and M. Govinda Rao (1991) have defined subsidies as "Government Subsidies may be defined as the differences between the cost of delivering various publicly provided goods and services and the recoveries arising from such deliveries". Thus in a budgetary context, it may be defined as "Unrecovered Cost in the public provision of private goods".

Beers, Cees van and Andre de Moor (2001), “Subsidies comprise all measures that keeps prices for consumers below market level or keep prices for producers above market level or that reduce cost for consumers and producers by giving direct or indirect support."

Two types of economic policy intervention stand out particularly in this definition. By regulating domestic prices and keeping them below world market prices, government support consumption. Subsidised consumer prices increases domestic consumption and this excess demand may induce additional imports and hence decrease foreign exchange revenues. Or governments may choose to subsidise production, for instance by imposing minimum price above market level. Producers expand supply and accelerate resource depletion, while public budgets are tapped to pay for surpluses. Both producer and consumer subsidies, either through overproduction or overconsumption, may be cause of environmental degradation.

According to Thomas, Kenneth P. (2007), an investment incentive is a subsidy given to affect the location of investment. The goal may be to attract new investment or to retain an existing facility. Further, he explains, "A subsidy, in turn, is money given to a firm by government. This can take many forms: cash grants, tax measures, loan at below-market rates, loan at a below-market interest rates, loan guarantees, capital injections, guaranteed excessive rate of profit, below-cost or free inputs including land and power, and purchasing goods from firms at inflated prices. This list is not exhaustive, but includes the type of support used in virtually all subsidies."
According to Reddy, K.S. (1987), in a developing country where market system is not competitive and its income distribution is skewed the interplay of forces of demand and supply does not always lead to socially desirable results. For instance, if market forces are allowed to operate freely, prices of important consumer as well intermediate commodities will be beyond the reach of a majority of consumers and producers. Hence, Government intervention in the market is needed to moderate these adverse influences. One of the policy instruments in this direction is the provision of subsidies, where the consumers or producers will be allowed to pay less than the market price and gap will be filled by subsidies. Hence subsidies can be defined as a payment made by the government to fill the gap between prevailing market price and the price paid by the buyers. A subsidy given in the product market is called consumers subsidy and one provided in the factor market is called producers’ subsidy. These subsidies can be broadly classified into direct and indirect subsidies. While direct subsidies are shown in the government budget under the sub-head “Subsidies” under relevant major heads, indirect subsidies are hidden under various entries in the budget.

Srivastava, D.K. et. al. (2003) have explained Subsidies, as converse of an indirect tax, constitute an important fiscal instrument for modifying market-determined outcomes. While taxes withdraw money from circulation, subsidies inject money into circulation. Subsidies affect the economy through the commodity market by lowering the relative price of the subsidized commodity, thereby generating an increase in its demand. With an indirect tax, the price of taxed commodity increases, and the quantity at which the market for the commodity is cleared, falls, other things remaining the same. Taxes appear on the revenue side of the government budgets and subsidies on the expenditure side. In a budgetary context, subsidies are taken as unrecovered cost of public provision of non-public goods, although the term may be defined in a variety of other ways.

According to Rao, Hemlata and H.K. Amar Nath (2003), the concept of subsidy used in Budget Document refers to the explicit payment made to producers to alter their price or output decisions or to consumers to encourage them to consume more because it is “meritorious” to do so. On the contrary, the National Accounting concept is broader as it includes, in addition of arising from the losses of departmental enterprises. Subsidies may be defined as “money granted by State or public body to individuals / firms or organizations (who has to bear a part of the cost) to bring down the cost by way of tax exemption, part payment by government, lower
interest charges and so on. Or to bring down the final price of those goods and services, which have large externalities or which lead to distributive justice”. For this part of assistance (subsidies), no equivalent compensation is received.

Conceptually subsidy may be explained in three different ways. The first refers to the term used in consumer parlance, the explicit budgetary subsidies. The second is the concept used in National Accounts and this implies the converse of indirect taxes. The third concept was first used in the Mundle and Rao (1991) study and subsequent work that followed in National Institute of Public Finance and Policy (NIPFP), New Delhi. This definition of subsidy provides the most comprehensive estimate and would include both definition of subsidy provided to the consumers (in the form of income supplement and below cost provision) as well as to the producers (including those to cover production inefficiencies.)

The unrecovered cost essentially represents the difference between the cost of the providing the services and the costs recovered from the consumers of the services through user charges. The difference can arise because: (i) the cost of providing the service is higher than the efficiency cost, (ii) the service is provided at the lower than marginal social cost to encourage its optimal consumption, (iii) it is found to be desirable to charge lower than marginal social cost to encourage its consumption by the poor and vulnerable section and (iv) its supply is designed inefficiently and user charges at optimal rates cannot be collected due to political reasons. The critical issue for policy is to estimate the last component and ensure that the subsidy is manages and targeted effectively to reach intended groups.

1.2 Taxonomy of the Subsidy

Subsidies may be defined as “money granted by State or public body to individuals / firms or organizations (who has to bear a part of the cost) to bring down the cost by way of tax exemption, part payment by government, lower interest charges and so on. Or to bring down the final of those goods and services, which have large externalities or which lead to distributive justice”. For this part of assistance (subsidies) no equivalent compensation is received. The following are some features of subsidies –

- Subsidies are money transfers from government.
- Transfers are intended to encourage consumption of goods or services by individuals / firms / organizations.
• Often the purpose of the subsidies is to reduce the cost or price of consumption of those commodities that have externalities or help achieving distributive justice.

• In principle, it is possible to price these goods or services, but they are subsidised because government wants to encourage their consumption / production for externality or merit good reasons.

• The recipient of subsidy may be required to bear some part of the cost (except when the goods have very high degree of externality).

• Subsidies are like negative indirect taxes that bring down the price of goods / services.

• An important feature of subsidies is that they have both substitution effect and the income effect.

• Implicit subsidies give rise to unrecovered cost.

• Subsidy is a converse of a tax.

• It is a redistribution of income.

• Can reduce certain cost of production.

• Over subsidisation could adversely affect environment and allocation of resources.

• In a general equilibrium framework the introduction of subsidies in one market would reverberate in to the system through several channels. First, if the subsidy would serve as an input like power, diesel or irrigation, the benefit of the subsidy will be extended to all final outputs where the subsidised good is being used as an input. In particular, their unit cost would go down. This will have implication for the final incidence of the subsidy that will be dispersed through several markets.

• Subsidies may induce a number of efficiency losses.

• The effectiveness of subsidies depends on their design. In general subsidies that are administered to final consumption or production are considered to be more desirable since they can accrue to the target beneficiaries directly.

• Untargeted subsidies promote inefficiency and induce wastage of scarce resources.
- Subsidies promote growth by increasing the level of critical inputs like health, education and infrastructure.
- Subsidies are regressive in nature.

Subsidies have a critical bearing on all the three components of sustainable development – economic, social, and environmental. For instance, a producer or a consumer subsidy that lowers the price of a fuel to the consumer increases its demand and also enhances overall energy consumption. The positive social effects flow out of enhanced access to energy services and economic benefits from promotion of employment in the domestic industry. The impact on environment may be positive or negative according as the subsidy or support is being provided on more (fossil fuels) or less (renewable or energy efficient technologies) polluting energy sources and technologies. Subsidies take different forms. Some take the form of direct impact on price, such as grants and tax exemptions, while others work in a more indirect fashion, such as regulation that tilt the market in favour of a particular good or government-supported research and development. Governments provide subsidies either through the budget or off-the budget, the latter more so on account of political economy of or special interests associated with subsidy and tax policy. Accordingly, the classification of subsidies provided in Earth Council (1997) and OECD (1998) could be integrated and adapted to derive the following taxonomy. As can be seen, the classification is by the type of subsidy, impact on the government budget and its point of impact.
Table 1.1

Taxonomy of subsidies

<table>
<thead>
<tr>
<th>Points of impact</th>
<th>Effects on Government Budget</th>
</tr>
</thead>
<tbody>
<tr>
<td>Direct Subsidies</td>
<td>On-budget</td>
</tr>
<tr>
<td>Grants or payments to consumers or producers</td>
<td>Grants or payments to consumers or producers</td>
</tr>
<tr>
<td>Indirect subsidies</td>
<td>On-budget</td>
</tr>
<tr>
<td>Effects on Government Budget</td>
<td></td>
</tr>
<tr>
<td>Raw Material And Intermediate Product Inputs</td>
<td></td>
</tr>
<tr>
<td>Support to material and energy input (e.g. energy, fertilizers, irrigation water)</td>
<td></td>
</tr>
<tr>
<td>Provision of infrastructure and complementary services below long run marginal cost</td>
<td>Materials and services in kind or below long run marginal cost</td>
</tr>
<tr>
<td>Capital and labour input or income or profit earnings</td>
<td></td>
</tr>
<tr>
<td>Support to non-material and non-energy inputs (e.g. labour and capital equipment)</td>
<td></td>
</tr>
<tr>
<td>Accelerated depreciation allowances</td>
<td></td>
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<tr>
<td>Income tax concessions</td>
<td></td>
</tr>
<tr>
<td>Concessional credit, preferential loans, loan or liability guarantees</td>
<td></td>
</tr>
<tr>
<td>Debt write-off</td>
<td></td>
</tr>
<tr>
<td>Provision of infrastructure and services at less than long run marginal cost</td>
<td></td>
</tr>
<tr>
<td>Support to research and development (e.g. on production techniques, safety and environmental protection) or government research and development expenditures.</td>
<td></td>
</tr>
<tr>
<td>On-budget</td>
<td>Off-budget</td>
</tr>
<tr>
<td>On-budget</td>
<td></td>
</tr>
<tr>
<td>Off-budget</td>
<td></td>
</tr>
</tbody>
</table>

Source: Earth Council 1997, and OECD 1998
1.3 Rationale for subsidies

Government provides subsidies for the following reasons:

- Correcting market failure
- Protecting national production from competition
- Reducing import dependence
- Encouraging national employment
- Ensuring balanced regional development
- Enabling access to and affordability of basic services or goods by all
- Stimulation of economic growth.

Subsidies are justified in the presence of positive externalities because in these cases considerations of social benefits require higher level of consumption than what would be obtained on the basis of private benefit only.

In general, subsidies are advocated in the presence of positive externalities. In such a case, the social benefit from the consumption of a particular commodity or service is greater than the sum of the private benefits to the consumers. Primary education, preventive health care, and research and development are prime examples of positive externalities. In these cases, private valuation of the benefits from such goods or services is less than their true value to the society, and normal pricing mechanism will not produce efficient outcomes. Subsidies can provide the necessary corrective measures in such cases. Subsidies have also been advocated for redistributive objectives, especially to ensure minimum level of food and nutrition to all section of the society.

However, subsidies need to be financed. These may be financed through additional taxation or borrowings. Taxation leads to dead weight loss in welfare. Therefore, whether introducing a subsidy is a welfare augmenting measure or not can only be judged in terms of additional welfare loss from additional taxation. The implications of additional borrowings also need to be considered in a macro framework because of the pressure it may exert on interest rates and crowding out of private investment.

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1 Market failure occurs when private actions contradict the social ends of an allocation of resources.
Figure 1.1

Rationale for Subsidies

\[
\begin{align*}
Q &= \text{quantity;} \\
P &= \text{price;}
\end{align*}
\]

\[
\begin{align*}
D_p &= \text{private demand;} \\
Ds &= \text{social demand;} \\
S &= \text{supply (social marginal cost).}
\end{align*}
\]
As an illustration, in Figure 1.1, the private demand curve for a food \((D_p)\) is below that of social demand curve \((D_s)\) due to externalities. The supply curve \((S)\) represents (social) marginal cost providing the good.

Left to the market forces, the quantity consumed will be \(Q_o\), which is less than the socially optimal consumption \(Q_i\). The government can intervene in the market by giving a subsidy which is equal to a vertical distance between the two demand curves, per unit of the good. This would shift the private demand curves, per unit of the good. This would shift the private demand curve to coincide with the social demand curve, increasing the consumption of the good to \(Q_i\). The total amount of the subsidy is required to indicate by shaded area. The increase consumption results from the fact that although the total unit price increase from \(P_o\) to \(P_i\), the private cost is reduced to \(WQ_i\), \(ZW\) being the element of subsidy in the price.

In the above illustration, one market was considered at a time. However, subsidies would also have repercussions at other markets. For example, as consumer buy more of the product under consideration, the demand for other products may decline. Assuming production to be subject to increasing cost (positively sloped supply curve), this will lower their price. Similarly, as the output mix changes, so would the derived demand for various factors. The ideal analytical framework for consideration of subsidies, like that of taxes, is a general equilibrium framework.

(Other illustrations may be considered distinguishing between cases where (i) the good is produced exclusively by private producers and (ii) by both private producers and government. Differentiation can also be made where the price includes a private cost element in addition to a social cost element with the good being produced entirely by the government. Differentiation in the extent of subsidy according to economic status or other considerations can also be examined in this analytical framework.)

### 1.4 Mode of Administering a Subsidy

A subsidy programme may be administered in a number of ways. Some alternative modes are as follows –

1. **Subsidy to producers** – A subsidy may be given to the producers of a good with the objective of augmenting its consumption. This would result in increasing the supply thereby enabling a higher consumption of the good.
Such subsidies may be given to offset losses of producers to ensure continued production.

2. **Subsidy to Consumers** – A straightforward way of encouraging consumption of a good is by giving the subsidy directly to the consumers, which would result in an increase in the demand (at every price level). In general subsidy to consumers on final goods may be recommended in preference to other modes, as it is earlier to monitor the distribution impact of the subsidy in this case.

3. **Subsidy to Producers of Inputs** – When a particular good can be produced by using different combinations of inputs, the use of a particular input is encouraged by providing subsidies on such an input being used in the production of the concerned good. This may also lead to lower prices for the consumers, and higher profit margins for the producers. The input subsidy can be provided in the form of cash subsidy to the producers of the input, per unit of output produced, or to the producers of the concerned good per unit of input based.

4. **Subsidies Through Public Enterprises** – Subsidies may be administered through direct intervention in the market by setting up a public enterprises to produce / procure / distribute the goods in question or their inputs at chosen administered prices. The differences in the market price and the actual sale / purchase price leads to the subsidy, while the government has to the sustain the losses incurred by the enterprises.

1.4.1 **Cross Subsidy**

It is often possible to distinguish between classes of consumers for a good or a range of goods. For example a distinction can be made between commercial and domestic users of electricity. Similarly, within the broad group of petroleum products a distinction may be made between kerosene and diesel vis-à-vis petrol and turbine fuel. In a certain sectors with one or more products is subjected to administered price regime, it is possible to charge some consumers (product-wise or use-wise) a price which is more than cost as to finance a subsidy given to other consumers by charging them a price which is less than cost. Such intra-sectoral financing of a subsidy involves cross-subsidisation. In such cases, if a net subsidy is still left after cross-subsidisation. It will be a charge on the general budget.
1.4.2 Subsidy Targeting

When subsidies are recommended because of market failure or other social objectives, they can be distributed among individuals according to a set of subjected criteria, e.g., (i) merit, (ii) income level, (iii) social group, (iv) regional, (v) product, etc. usually such discrimination itself is administratively costly. Two types of error arise if proper targeting is not done, i.e. exclusion errors and inclusion errors. In the former case, some of those who deserve to receive a subsidy get excluded and in the latter case, some of those who do not deserve to receive subsidy get included in the subsidy programme.

1.5 Effects of Subsidy

Economic effects of subsidies broadly can be grouped into (i) allocative effects, (ii) redistributive effects, (iii) fiscal effects, (iv) trade effects (v) positive effects, and (vi) negative effects.

- Allocative effects relate to the sectoral allocation of resources. Subsidies help draw more resources towards the subsidised sector.

- Redistributive effects, as between producers and consumers, and as between rural and urban population or between rich and poor population, generally depend upon the elasticities of demand of relevant groups for the subsidised good as well as the elasticities of supply of the same good, and the mode of administering the subsidy.

- Subsidies have obvious fiscal effects since a large part of subsidies emanate from the budget. The directly increase fiscal deficits. Subsidies may also indirectly affect the budget adversely by drawing resources away from tax-yielding sectors towards sectors they may have a low tax revenue potential

- Often a regulated price, which is substantially lower than market clearing price, may reduce domestic supply and lead to an increase in imports. On the other hand, subsidies to domestic producers may enable them to offer internationally competitive prices, reducing imports or raising exports.

- Subsidies could encourage sustainable agricultural and industrial practices and greater equity. In fact, they could play a crucial role in effecting the needed transition to more sustainable forms of development worldwide.

- The dark side of the subsidy is that it can be counter productive.
Subsidies may also lead to perverse unintended economic effects. They would result in inefficient resource allocation if imposed on a competitive market or where market imperfections do not justify a subsidy, by diverting economic resources away from areas where their marginal productivity would be higher. Generalised subsidies waste resources; further, they may have perverse distributional effects endowing greater benefits on the better-off people. For example, a price control may lead to lower production and shortages and thus generate parallel markets resulting in profits to operators in such markets and economic rent to privileged people who have access to the distribution of the good concerned at the controlled price.

Subsidies have a tendency to self-perpetuate. They create vested interests and acquire political hues. Also, it is difficult to control the incidence of a subsidy since their effects are transmitted through the mechanism of the market, which often has imperfections after than those addressed by the subsidy.

1.6 Approaches to Estimation of Subsidies

Measurement of the magnitude of subsidies is not a straightforward exercise. Different approaches and conventions appear to have evolved in this context. Differences in methodologies arise with respect to

i. **source of information** – budget based, national accounts or any other source;

ii. **coverage of transactions** – cash subsidies only, implicit subsidies in soft loans, government guarantees; only budget based subsidies or also extra-budgetary subsidies; gross cost to government or only net costs;

iii. **sectoral coverage** – agriculture, manufacturing, etc.;

iv. **measurement basis** – focus on recipients of subsidies or ultimate beneficiaries

There are two major conventions in the estimation of subsidies relate to measurement through (i) the Budgets and (ii) the National Accounts.

1.6.1 Budget-Based Approach

Budgetary cost of subsidies is usually defined as budget outlays on a service net of cost recovery through user charges etc. It is commonly recognised that entries in the budget under the head of ‘subsidies’ would give a very incomplete picture of subsidies. Since explicit subsidies cover only a fraction of total subsidies.
Methodologies have been developed to also estimate implicit subsidies in the system as unrecovered cost of public services, at least for those public services/goods where the principle of non-rivalry and non-excludability is not applicable. In these cases, it should be possible to recover, at least in principle, the cost of providing services according to the extent of their consumption. It is a general practice to exclude pure public goods such as defence, general administration, etc., in the context of subsidies, although subsidies may arise even in the process of producing a pure public good. For example, in the case of defence expenditure, there may be a procurement subsidy in the purchase of defence goods.

1.6.2 National Income Accounting Approach

In the national income framework, subsidies net of indirect taxes, constitute the difference between product measures (GDP, GNP) at factor cost and at market prices.

In national income accounts (NIA), indirect taxes are deducted and subsidies are added in order to arrive at estimates of gross domestic product (GDP) at factor cost from the estimates of GDP at current market prices. Indirect taxes that are part of the sale price of commodities do not create incomes for factors of production. These are, therefore, deducted from GDP at market prices to get at GDP at factor cost. On the other hand, subsidies have the reverse effect. A subsidy received by a firm will be paid out as wages, rents or profits, and would therefore, become an income of the factors of production. However, this component of their income is not generated by the sale of output. Hence, subsidies must be added to expenditure, i.e., GDP at market prices.

In the Central Statistical Organisation's NIA methodology, subsidies include grants on current account which private industries, public corporations and government enterprises receive from the government. These may be in the form of direct payments or those estimated on the basis of differentials between buying and selling prices of government trading organisations. The NIA approach focuses only on firms/producers or government departments. It does not fully cover all the budgetary costs in the public provision of non-public goods.
1.7 Importance and Scope of the Study

Reducing or rationalising subsidies to improve fiscal health is a challenging task and should be main focus of the economic reforms. The estimates made by earlier studies are not comparable over a period of time. The methodology of estimation of budgetary subsidies has undergone many changes and the conceptual definition used in various studies differs from each other. Justification of subsidies in certain services through classification of services, in these studies varies from one another. The Discussion paper brought out by the Ministry of Finance, Government of India in 1997, cautioned for increasing burden of subsidies both explicit and implicit on exchequer of both Central, and State Governments, and suggested a need for reducing the same for improving the fiscal health of the governments. Therefore, it is necessary to estimate implicit budgetary subsidies with one single methodology and conceptual clarity over a period of time and examine whether there has been any impact of economic reforms (which have been initiated in India since 1991) on reducing or rationalising the implicit and explicit budgetary subsidies so as to improve the fiscal health and set an agenda for the future.

The present study examines the implicit subsidies in terms of low cost recovery in the provision of services. The study forms the basis for policy options to correct fiscal imbalances in the State of Utter Pradesh and warrants a careful calibration of budgetary subsidies with a view to make them more transparent and targeting to intended beneficiaries.

The earlier studies on State's subsidies have not computed subsidies for more then a year or a time series. If a change in the volume and composition of subsidies or efforts of the government in rationalising them are to be studied then a time profile of the volume and composition is essential. In the present study, we have constructed a discrete time series of the implicit subsidies in Utter Pradesh since 1990-91 to 2005-06. Highlighted economic reforms in containing subsidies or rationalising them towards socio-economic development. The significance of the study is the estimation of subsidies of a State of India for seven years and categorisation of services to weed out unnecessary subsidies, in which, the role of the government can be reduced or withdrawn.

After reviewing various earlier studies, the present study, uses the most suitable methodology with utmost conceptual clarity, in estimation of the implicit budgetary subsidies for the State of Uttar Pradesh for different years in a comparable manner.
after initiation of economic reforms and various fiscal adjustment measures during the reform period. Attempts have been made to estimate the volume and composition of explicit and implicit subsidies and tiptoes around policy measures required to target them. The important sectors of social and economic services are analysed in detail in this study. The study besides suggesting a prescriptive policy, also attempts to highlight the direction in which these implicit budgetary subsidies are moving. The study covers a discrete series of time period since 1990-91 till 2005-06 by taking 1990-91 as the initial year of the concern economic reforms, 1993-94 as first application for the assistance from the world bank, 1995-96 as structural adjustment loan from the World Bank and conditions attached to it, 2003-04, write off the loans, and 2005-06, the latest year for which the data is available by using one common definition as adopted by Srivastava and Amar Nath (2001), Srivastava and Rao, (2003).

1.8 Objectives of the Study

The following are the objectives of the present study:

1. To analyse the trends and volume of major budgetary subsidies in India;

2. To estimate and to compare a discrete series of both explicit and implicit budgetary subsidies from non-public services for the State of Uttar Pradesh;

3. To examine the trend and the composition of budgetary subsidies and recovery rate from non-public services provided by the State Government of Uttar Pradesh.

4. To arrive at the meaningful inferences to suggest required measures to reduce or redirect the subsidies in favour of Social Welfare.

1.9 Hypothesis

The fiscal correction measures initiated since 1991, have no doubt given some indication that the governments, both at the Centre and the State level, have been serious about improving the finances of the government by various means. Rationalisation of subsidies is one of the serious concerns of the governments both at Union and the State levels. The impact of these measures on subsidies – implicit and explicit – in reorienting subsidies towards welfare including social or economic services needs to be captured. With this background, in our study, we want to test the following hypothesis –
"There are serious efforts as a part of fiscal correction measures by the Government of Uttar Pradesh to rationalise the subsidies for increase in social welfare".

1.10 Methodology

To compute the subsidies we have used the same methodology which was used by Srivastava et.al. (2003), with a slight modification in transfer payments.

The data relating to explicit budgetary subsidies have been provided in the Budget Documents or Finance Accounts of the Government. For consistency in statistical analysis, the study mainly depends on the Finance Accounts published by the Comptroller and Auditor General of India for collecting the required information on implicit budgetary subsidies. As such, there is no need for estimation process involved in arriving at the explicit budgetary subsidies.

In the present study, the focus is on budgetary subsidies and the main objective is to estimate implicit subsidies in the State of Uttar Pradesh during 1990-91 to 2005-06. Implicit budgetary subsidies have been defined as un-recovered costs of providing non-public goods, measured as the excess of aggregate costs over aggregate receipts. Non-public goods are classified as social and economic services in the budget documents. Costs have two elements: (1) Current costs or Variable costs and (2) Annualised capital costs. The current costs consists of revenue expenditures directly related to the provisions of services, and classified under different budgetary heads. Aggregate receipts consist of revenue from user charges and interest and dividend received from lending and investment, respectively. Transfer payments to individuals, which adds to income of the recipients and do not constitute the costs of providing services, are excluded from these expenditures. Whereas, the capital costs are considered, cumulative investment is separated from cumulative capital expenditure to arrive at capital stock. An imputed rate of return (cost of borrowing) is applied on investment and capital stock to arrive at opportunity or imputed costs of capital stock and investment and an estimated depreciation on capital stock to arrive at annualised capital costs. The receipts come in three forms: revenue receipts from the user charges, interest receipts on loans, and dividends on equity investment.

Like the earlier studies a two per cent depreciation in nominal terms with an assumption of life span of 50 years on capital investment in public sector is assumed. But, here a different methodology is applied to adjust the capital stock,
which is a summation of nominal investments in historical prices into real terms and an adjusted depreciation rate (ADR) is arrived. The stimulated ADR also considers investment growth as one of the parameters. The depreciation rate thus, is arrived at by simulating the alternative values of parameters of inflation and growth rate of investment. Capital Stock is adjusted for conversion into real term and allows for a gestation period by Srivastava and Amar Nath methodology, but continues with the earlier assumption of 50-years life span for the capital invested in public sector. The imputed rate of interest is the actual cost of borrowing in the previous year by the Government.

In terms of mathematical symbols, methodology of estimating implicit budgetary subsidies can be expressed as follows:

1. The cost of providing public services can be defined as

\[ C = RX + (I + d^*) K_0 + iZ_0 \]

Where,

- \( RX \) = revenue expenditure on the service head net of adjustments
- \( i \) = effective interest rate
- \( d^* \) = depreciation rate
- \( K_0 \) = aggregate capital expenditure at the beginning of the period
- \( Z_0 \) = sum of loans and equity investment at the beginning of the period

Adjustments in deriving \( RX \) relate to transfer to funds which are deducted and transfer from funds which are added. Transfers to individuals are also not counted, although these are separately compiled. Expenditure on running secretariat social and economic services are also not counted as these relate to general administration, and are also not decomposable among different heads of services.

2. Receipt from providing services are defined as:

\[ R = RR + (I+D) \]

Where,

- \( RR \) = revenue receipt
- \( I \) = interest receipt
- \( D \) = dividends
3. Implicit Budgetary Subsidy (S) is defined as:

\[ S = C - R \]

Other parameters are effective interest rate and depreciation rate. The effective interest rate is obtained by dividing the interest payment in current year by outstanding debt at the beginning of the concerned year. Only three components of debt are considered for this purpose. They are a) Loans and Advances from Centre; b) Internal debt of the government and c) Small Savings and Provident funds. Table A1.1 (given in appendix) gives the estimated parameters.

Estimation of depreciation costs should take into account, the fact that capital stock in the finance accounts presents an accumulation of past investments at different prices prevailing in different years in the past.

The depreciation rate is to be calculated with reference to the stock of capital at the beginning of the year. This stock of capital is the sum of nominal investments in previous years. Since these are additions of nominal figures, all at different prices, the calculation of depreciation rate has to take this into account. The methodology used for this purpose is explained below.

Let the life of a capital asset be \( T \) years. The rate of depreciation would be \( (1 / T) \) per year for the asset to be written off. For example, if \( T = 50 \) (years), \( 1 / T = .02 \). Let the current year be \( T + 1 \). The past years under consideration are from 1 to \( T \). Let nominal investments in these years be written as

\[ I_1, I_2, \ldots, I_T \]

Assuming an investment growth rate of \( z \), we have

\[ I_2 = (1 + z) I_1 \]

\[ I_T = (1 + z)^{T-1} I_1 \]

Thus,

\[ I_1 = I_T / (1 + z)^{T-1} \]

Correspondingly,
\[ I_1 = \frac{I_T}{(1 + z)^{T-1}} \]
\[ I_2 = \frac{I_T}{(1 + z)^{T-2}} \]

\[ \vdots \]
\[ I_{T-1} = \frac{I_T}{(1 + z)} \]
\[ I_T = I_T \]

If the long-term rate of inflation is \( i \), a nominal amount of 1 in year 1, is \((1 + i)^{T-1}\) in terms of the prices of the \( T^{th} \) year.

Then, the sum of \( I_1, \) etc., in terms of the prices of the \( T^{th} \) year can be written as

\[ I_T \left( \frac{1+i}{1+z} \right)^{T-1} + I_T \left( \frac{1+i}{1+z} \right)^{T-2} + \ldots + I_T \]

\[ = I_T \left[ w^{T-1} + w^{T-2} + \ldots + 1 \right] \]

Where,

\[ w = \left( \frac{1+i}{1+z} \right) \]

Let, \( K_T = (I_T + I_{T-1} + \ldots + I_1) \) indicate aggregate capital expenditure obtained by summing investments measured in the prices of the respective years in which they were made. We can write:

\[ K_T = I_T + \frac{I_T}{(1+z)} + \ldots + \frac{I_T}{(1+z)^{T-1}} \]

\[ = I_T \left[ 1 + \left( \frac{1}{1+z} \right) + \ldots + \left( \frac{1}{1+z} \right)^{T-1} \right] \]

\[ = I_T \left[ 1 + x + \ldots + x^{T-1} \right] \]

Where,

\[ x = \frac{1}{1+z} \]

or

\[ I_T = K_T / \left( 1 + x + \ldots + x^{T-1} \right) \]
Depreciation for one year in terms of the prices of year $T$ is given by

$$\left(\frac{1}{T}\right)T \left(1 + w + w^2 + ... + w^{T-1}\right)$$

Depreciation in terms of prices of year $(T + 1)$, i.e., the current year, can be obtained by multiplying the above expression further by $(1 + i)$. Thus, if $K_T$ (i.e., outstanding accumulated capital stock in nominal terms) is to be used as the base, the depreciation rate on this should be

$$\left(\frac{1}{T}\right)T \left(1 + w + w^2 + ... + w^{T-1}\right) \left(1 + x + ... + x^{T-1}\right) (1 + i)$$

We will refer to this expression as the adjusted depreciation rate (ADR). By simulating with alternative values of parameters ($i, z$) the following features regarding the impact of changes in the parameters on the depreciation rate can be derived.

i. The higher inflation rate, the higher is the depreciation rate, for any given rate of growth of investment.
ii. The higher investment growth rate, the lower is the depreciation rate for any given inflation rate.

One more adjustment has been made. After investments are made the stock of capital does not always start yielding service immediately. Roughly $1/3$rd of capital stock for three years immediately preceding the reference year is not counted and depreciation rate accordingly is adjusted.

There are several features and limitations of the estimation methodology, which arises from various assumption made or procedures followed at different steps. In particular, it may be noted that tax expenditures are not included in the estimates. Average life of an asset is assumed to be fifty years. Estimates are based on actual prices even if these are administered and not on the basis of market prices which would prevail in the absence of regulations. Subsidies arising from administered price regimes or off-budget subsidies are also not captured here. The estimation does not cover the inefficiency cost of in provision of services.
Implicit budgetary subsidies for non-public goods are classified based on the basis of merits and externalities involved. The recovery rates of both variable cost and capital costs are estimated and analysed for all the selected years.

1.11 Data Sources

The data required for the study are mainly collected from the Finance Accounts, published by the Comptroller and Auditors general every year. Information on the State income and capital formation are collected from the Central Statistics Organisation and the Directorate of Economics and Statistics, Government of Uttar Pradesh. Data on State finances are collected from State Finances, Reserve bank of India, various issues for a time series analysis. Sufficient care is exercised while collecting the data from various sources for conceptual clarity and classification adjustment. Population data is taken from Central Statistical Organisation, Government of India, and Gross State Domestic Product data is obtained from “Gross Domestic Product of Indian States”, EPW research foundation, Mumbai, for earlier years and Directorate of Economics and Statistics, Government of Uttar Pradesh.

- Since the required data for calculation of depreciation is not available, depreciation rate is taken to be 0.472 as estimated by Srivastava, C. Bhujanga Rao, Pinaki Chakraborti, and T.S. Rangamannar (2003).
- To compute net expenditures the transfer to funds and transfer to individuals have been subtracted, as they do not add to the provision of service.
- Grants-in-Aid and assistance to PSUs is also netted out as the service providers are outside the government and recovery of user charges are not appropriated by the government.
- Though all these above items except transfers to funds are netted out they can be treated as explicit subsidies and are listed in a separate Table.
- An adjustment is made in the data after bifurcation of the State on November 8, 2000 for arriving capital cost, investment, loans, progressive figures of composite State of Uttar Pradesh as on November 8, 2000 that are yet to be apportioned between successor States of Uttar Pradesh and Uttaranchal (now Uttarakhand), which are shown in the bold letter in finance accounts, are divided on the basis of per cent of population of both States.
1.12 Limitations of the Study

The ongoing research has come across many constraints during the course of the work. These constrains include both conceptual as well as statistical problems. Brief mention of the limitations of the study are as follows:

1. We have not computed the implicit subsidies for the Central government of India, because that is out of scope of the study. Although we have discussed the quantum of implicit budgetary subsidies, as computed by the earlier studies.

2. We have computed implicit budgetary subsidies in Uttar Pradesh for selected years and not for each year during the study period. The calculation of subsidies for each year would have been very time consuming, more over, it is not excepted to have a significant change in each year.

3. As the data for the calculation of depreciation rate is not available, we have taken it as suggested by the study of Srivastava, C. Bhujanga Rao, Pinaki Chakraborti, and T.S. Rangamannar (2003).

4. The study assumes a life span of 50 years on capital stock, but not all the assets have the same life, some depreciate faster.

5. Land as an asset may actually appreciate.

6. The costs also include various cost of inefficiencies, the present study could not separate out the inefficiency cost in provision of services by the government.

7. Simple ratio are calculated for the analysis and testing of the hypothesis.

8. The classification of services made in the sixth chapter is purely discretionary and closer to the characteristics of these services. But one can move any of these services from one category to the other on relative degrees of externality. The exact externalities involved is not measured.