CHAPTER - IV

DATA AND METHODOLOGY

In the present study, we have undertaken analysis of the expenditure of Gujarat state. Several reasons have motivated us to choose this state. The expenditure data that we needed for our analysis purpose was readily available from the Gujarat Bureau of Economics and statistics, Gandhinagar. This was probably the single most important factor for choosing Gujarat for our study. The pattern of expenditure by the various states is not uniform. Therefore an analysis based on the aggregate expenditures of all states would give misleading results. Therefore other possibility was to study the structure and composition of expenditure by each state separately. However, due to time constraint we have neither been able to study expenditure of more than one state nor been able to compare the expenditure pattern of state expenditure in Gujarat vis-a-vis other states. Also, in terms of Industrial development, it is one of the fastest growing states. People of Gujarat are considered to be more entrepreneurial compared with those of other states. It was also financially a more prudently managed state and its public sector corporations are relatively more professionally managed in comparison to other states. It is also a high income state with more progressive outlook. Historically speaking, merchant capital has played very important role in its development and it has the long tradition of industrialization.
Classification of the Expenditure Data

The state Government Budget is primarily designed to facilitate the needs of the administration and authorisation of expenditure and revenue proposals by the state legislature. Therefore the budgetary data itself is not very useful for a detailed analysis of the government expenditure.

A basic requirement for the analysis of the composition of government expenditure is its classification. Classification of government expenditure may be attempted in more than one way depending upon the purpose at hand. It may be done (i) by homogeneity or in terms of common characteristics or intended purpose or effects, (ii) by nodality, i.e., in terms of geographic characteristics, and (iii) by programme or policy orientation, i.e. primarily in terms of administrative or political coherence and institutions. Bird\(^1\) favours classification in terms of all the three categories. Musgrave\(^2\) prefers economic characteristics - transfer payments, capital formation, etc., Pryor\(^3\) emphasises functional categories - education, health, defence, etc. and Peacock and Wiseman\(^4\) choose economic and functional classification.

For purpose of our analysis we have used the expenditure data classified in terms of economic and functional (purpose) categories because our purpose is to examine changing composition of expenditure in both economic and functional terms. This is because the financial statement and the demand for grants in a government budget are drawn in accordance with the provisions of the constitution and the needs of the legislature control. The expenditure in the government budget is generally classified departmentwise in order to secure legislature control and administrative accountability. The budget so presented reveals merely the financial transactions and not the economic and social significance of the transactions. Therefore the economic significance of the different items of the expenditure cannot be easily made out directly from the study of the budget, because the magnitudes of the budget are detailed and scattered. For example, from the study of the budget documents, as they are, it is not possible to get a clear idea of capital formation resulting from the budgetary resources, savings of the state government, government's contribution in generation of state domestic product, etc. The budgetary operation of the government need to be sorted out and reclassified into appropriate economic groups to understand the economic and social effect of government expenditure. The presentation of budget in this form, called economic classification yields more detailed information of the government transactions and is useful for evaluating the government's programmes with respect to particular services and also helps in understanding the nature of the impact of budgetary operations on the state of the economy. However, the economic classification which groups the items of expenditure such as wages and salaries, commodities and services, repairs and maintenance, etc., according to their economic character,
reveals only the economic magnitudes, but do not reveal the ultimate objective or purpose of the expenditure. Thus, besides the economic classification, the state government expenditure needs to be classified in accordance with the purpose for which the funds are expended, e.g., general government services, education, health, etc. This is called functional or purposewise classification of the budget.

Although, there is no unique system of classifying the information on government transactions which would bring out all economic implications of government expenditure growth, the analysis in terms of economic-cum-functional classification insights into the economic implications of the growth of public suggested in the U.N. Manual (1958) provides very useful expenditure. This classification has certain advantages.

Firstly, it ensures comparability of data over time and across states. Second, it presents more realistic picture of government transactions by eliminating (i) various inter-governmental (inter-departmental) transfers (ii) transfers to various funds and by adjusting the accounts to show net receipts of commercial departments instead of showing them on gross basis. The last and the most important is the fact that the classification presented in the budgets are designed to serve the purpose of budgetary control and not meant for economic analysis of government transactions. As, our purpose is to study the trends and changes in the composition of state government expenditure, we

have used the economic and functional classification published by the Bureau of Economic and Statistics of the state government.

As mentioned above, the data on SDP as well as expenditure was collected from the Bureau. Studies related to expenditure growth, many times use different deflators for different categories of expenditure. However, in this study, we have used a single deflator: that is all India whole sale price index. We are certainly aware of the limitations of using a single price deflator for various categories of expenditure—one limitation of using such a deflator is that it is calculated on all India basis and therefore many be relatively less relevant for a particular State. Second limitation is that it really underscores the changes in the purchasing power of the government. Also, due to time constraint and lack of easy accessibility to the published data of C.S.O on prices of different categories of expenditure, we have restricted ourselves to using a single price deflator. Another reason for using a single price deflator is that initially we had also plan to compare the growth of expenditure in Gujarat with some other states and for this purpose a single price deflator would have provided a more comparable data series.

The purpose of deflating any data-series is to remove the impact of inflation on it and get a real picture of the changes that have taken place over a period of time. The inflation and changes in the rate of inflation in our country are calculated on the basis of all India whole sale price index. Therefore we thought it appropriate to use a single all India whole sale price index for the purpose of deflating the series.
The choice of a single deflator is also dictated by the need for a simple and directly observable indicator of inflation. This avoids the problem arising out of distortions which many be created by the use of multiple deflators with varying appropriateness and reliability. Generally, the researcher looks into alternative price deflators for each category of expenditure and decides upon the most appropriate and available deflator. However, in many cases, there is no unanimity about the choice of the best indicator. For example, price deflators used of the capital expenditures are not reflected correctly by machinery price indices mostly used by the researchers because machineries would hardly represent the real increase in the price of relevant capital expenditure category. Similarly, there could be questions about choice of a relevant consumer price index to be used to deflate expenditure on wages and salaries. In each case there would be problems of aggregation and weighting. Therefore we have decided to use a single price deflator that is, the all India whole-sale price index.

The analysis has been carried out using economic and functional classification of the government expenditures. The overall growth rate (for variable y) has been calculated using semi-logarithmic model of the following form:

\[ \ln Y = a + b T + u \ldots (1) \]

where \( T = \) Time, \( u = \) error term, \( a \) is intercept and \( b \) is growth rate.

Because of the sudden jumps in the data at certain intervals, we can divide the total period into one or two sub-periods and the sub-period growth rates
can be calculated. However, sudden breaks or jumps in growth rates lead to certain problems to be explained later on. Therefore growth rates have been calculated by using kinked exponential model as suggested by Boyce. 

Thus in order to calculate acceleration in the expenditure, the series has been divided into relevant sub-periods depending upon the sudden jump in the acceleration of expenditure. In order to obtain the growth rates during the sub-periods, consistent with the overall rates of growth, we have estimated them using the kinked exponential model by introducing dummy variables.

In the case of functional classification of expenditure data, the time series for the period t=1 ... n is broken at one point k and then discontinuous growth rate estimates for the two resulting sub-periods have been calculated using the following equation:

\[ \ln Y_t = a + b_1 (D_1 + D_2 k) + b_2 (D_2 t - D_2 k) + u_t \ldots \] (2)

The OLS estimates of \( b_1 \) and \( b_2 \) from the above equation gives the exponential growth rates for the two sub-periods. There is a kink between the two trend lines whenever \( \hat{b}_1 \neq \hat{b}_2 \). In the case of economic classification, there are two kinks in the time series data and therefore following tow-kink exponential model has been used:

\[ \ln Y_t = a_1 + b_1 (D_1t + D_2k_1 + D_3k_1) + b_2 (D_2t - D_2k_2) + b_3 (D_3t - D_3k_2) + u_t \] 

The growth rates in the three sub-periods are now given by the OLS estimates of the coefficients of the resulting composite variables.

A distinctive feature of kinked exponential growth models, as opposed to conventional discontinuous model, is that they make use of information regarding the values of the variable in question throughout the time series in estimating the growth rate for a given sub-period. The rationale for preferring fitted trends over simple points-to-point growth rate calculations is that OLS estimates are less affected by instability or cyclical fluctuations. This eliminates what can be termed the discontinuity bias of conventional sub-period growth rate estimates. The sensitivity of growth rate estimates to instability is, thus reduced, by the kinked exponential method. Boyce has provided suitable illustrations by comparing alternative estimates of agriculture output growth rates in Bangladesh and Indian state of West Bengal. By comparing discontinuous growth trend estimates with that calculated using kinked exponential model, Boyce has shown that the former growth rates give anomalous results due to discontinuity bias. The kinked exponential model, argues Boyce, removes this discrepancy as it imposes a continuity restriction at the break points between sub-periods and therefore provides an improved basis for growth rate comparisons. Thus in the absence of special circumstances such as definitional changes or natural disasters, kinked exponential models are preferable to discontinuous ones for growth rate comparisons.
We have also calculated elasticities of various items of expenditures in order to get an idea about the responsiveness of these expenditures vis-a-vis changes in the State Domestic Product.