CHAPTER I
INTRODUCTION AND REVIEW OF LITERATURE

1.1 INTRODUCTION

Public expenditure plays a significant role in the functions of economy at almost all stages of economic development. The government resorts to expenditure and revenue programmes to produce desirable effects on the national income, production and employment. Public expenditure aims at the expansion of the volume and rate of investment in both public and private sectors and the increase in the production of agricultural and industrial sectors. Further, a planned scheme of public expenditure provides for an optimum resource allocation which is not guaranteed by the market, and also reduces the inequality in the distribution of resources by properly directing the expenditure towards education, medical and health care of the low income section of the community. Besides, public expenditure counteracts inflationary pressures and helps to stabilize the economy by formulating suitable fiscal policies such as drawing up the budget, providing surpluses in deficit and boom in recessions by accelerating the rate of development expenditure in the public sector steadily. The attainment of these goals of the state governments depends on the fiscal policy of the
central government and the autonomy of the state governments in raising revenue and spending it.

The division of functions and revenue raising powers between the central and state governments is governed by the Constitution, largely influenced by the Government of India Act, 1935. Functions like defence, external affairs, foreign trade, railways, national highways, ports, interstate trade, currency and coinage having national significance are assigned to the Centre. In order to carry out these functions, the Centre has been endowed with powers to levy major taxes like income tax, customs including export duties, and corporation tax. But the states are provided with functions like public order, police, administration of justice, agriculture, water supply, irrigation and canals, education, public health and other social security services. They are conferred with powers to levy less important taxes like land revenue, agricultural income tax, sales tax, excise on alcoholic liquors, entertainment tax, motor vehicles tax, and stamp duties.

The state governments' own sources of revenue are inadequate to meet their expanding responsibilities. Hence, there arises a gap between the fiscal needs and the revenue resources of the state. The framers of the Constitution anticipated these vertical imbalances and
provided for a fiscal re-adjustment in the Constitution itself. The Constitution proposes a transfer of resources from the Centre to the states such as assignment of the entire proceeds of certain taxes levied by the Union Government, mandatory sharing of the proceeds of income tax, participation in the proceeds of Union excise duty and statutory grants-in-aid to the states. In addition, it has also provided for an independent statutory body of finance commissions to regulate the transfer of resources from the Centre to the states periodically, every five years.

Since 1951, nine finance commissions have been set up to determine the principles of tax devolution and grants-in-aid on the basis of certain criteria such as population, per capita income, indicators of backwardness, tax efforts, percentage of Scheduled Caste and Scheduled Tribe to the total population, and percentage of enrolment in schools with main emphasis on population and collection of taxes. The main issue is whether these broad indicators coincide with the reality or whether there are any other factors which determine the expenditure needs of the state governments. The factors influencing public expenditure need empirical verification of causality between expenditure and tax revenue, which form the main components of government
finances. In this context, a brief review of both causality and determinant studies will be useful in order to identify the gaps in earlier studies.

1.2 REVIEW OF LITERATURE

The literature on public finance abounds with studies that deal directly or indirectly with the expenditure determinants of government at national, state and local levels. The increasing significance of public expenditure in economic development and the identification of the determinants of public expenditure have become the subject of recent interest among economists. The present study reviews the literature on causality studies and on public expenditure determination.

1.2.1 Review of Causality Studies

Among the determinants of public expenditure, tax revenue is considered the most important because government spending is limited by the budget constraint, which consists of direct and indirect tax receipts. Just as an individual's spending decisions are determined by accumulated wealth and income, the government's spending decisions are also determined by the resources of the government, namely tax receipts. To find the nature and direction of the relationship between revenue and
expenditure, causality test is administered. These causality studies centre around certain hypotheses, such as taxes lead to more spending and higher expenditure causes higher tax revenues. Economists like Friedman\(^1\) are of the view that raising taxes will lead to more spending. Buchanan and Wagner\(^2\) argue that deceptive government financing leads to a higher level of spending. Barro\(^3\) states that higher government spending leads to higher taxes. Thus, there are different views regarding the relationship between tax revenue and expenditure. But systematic econometric tests, like the causality test, will reveal the exact relationship between tax revenue and expenditure. There are several causality studies undertaken at national and international levels to test the direction of tax revenue and expenditure.

Most of the international studies are related to the U.S. federal budget. William Anderson and Wallace\(^4\) have tested the relationship between real federal spending and real federal taxes through Granger's\(^5\) test of causality. Two other variables, namely Gross National Product and Inflation, are also included in this model. The variables are taken both in total and per capita terms. The study covers the period 1946-1983 based on the data of the U.S. federal government. The results agree with Barro's hypothesis that expenditure causes revenues, and it is
contrary to Friedman's and Wagner's views that increased revenues cause increased expenditure. The findings are: real expenditure causes real taxes and there is a lack of relationship between inflation and government revenues.

Manage and Marlow\(^6\) have examined the causal relationship between federal expenditure and federal tax revenue of the United States during 1929-1982 by employing Granger's test of causality with three alternative specifications nominal values of government outlays and tax revenues, real government outlays and real tax receipts deflated by the consumer price index, and nominal government outlays minus net interest payments on the public debt and nominal tax receipts. In all these three specifications, the result indicates feedback or bi-directional causality between revenue and expenditure for all lag structures except for (2,2) and (5,5) lag length. The (2,2) and (5,5) lag structure indicates uni-directional causality from tax receipts to expenditure. This study does not favour tax increases over spending reduction as a means of closing future deficit levels of the federal government.

In their second study, Manage and Marlow\(^7\) have examined the causal relationship of these two variables in the state and local governments of the U.S. during the period 1952-1982 by employing the same test. According to this study based on the state nominal data, there is uni-
directional causality from tax receipts to expenditure for all lag structures except the shortest (2,2). For the shortest lag structure, the test indicates bi-directional causality. But the result on local government data reveals no causality between the variables, i.e., the variables remain independent. The authors have mentioned the problem of aggregation as the reason for this result. The policy implication is that, to solve deficit at all levels, the government should consider the linkage between tax receipts and expenditure.

Blackley\(^8\) has tested the proposition for the U.S. federal government that fluctuations in revenue cause fluctuations in expenditure, and vice-versa. Also a trivariate causality analysis has been done by including the Gross National Product along with these variables. The study pertaining to 1929-1982 employs both Granger and Sims\(^9\) test. According to both the tests, revenue growth causes greater growth in expenditure. According to the trivariate analysis, the impact of revenue on expenditure is much greater than that of the Gross National Product.

1.2.2 Studies in Public Expenditure determinants

Based on the hypotheses of Wagner\(^10\), and Peacock and Wiseman\(^11\), empirical studies of public expenditure have been attempted in many countries. Adolf Wagner\(^12\) has
studied the growth of public expenditure by establishing a functional relationship between the growth of economy and the growth of public sector activity. His law is referred to as the Law of Increasing State Activities. Peacock and Wiseman\textsuperscript{13} have made an empirical study of the growth of public expenditure in the United Kingdom during the period 1890-1955. They explain the growth of expenditure in terms of displacement effect, i.e., emergencies like war and depression cause a larger impact on public expenditure. Musgrave\textsuperscript{14} has analysed the growth of expenditure by classifying it into (a) public capital expenditure, (b) public consumption expenditure and (c) transfer payments. He has also established a functional relationship between the above disaggregated expenditure and a set of factors such as per-capita income and population.

The pioneering study in the determinant aspect has been the one by Fabricant\textsuperscript{15} in the USA and his 'Triko', three variables, cover per-capita income, degree of urbanisation, and density of population, to explain 72 per cent of the variations in expenditure differences among states. Other studies have also been made in the USA using Fabricant's determinants.

Fisher\textsuperscript{16} has analysed variations of state and local expenditure in terms of per capita income, density of population, and urbanisation in 48 states of the United
States in 1957. He has also examined the variation of expenditure by functional classifications. According to the findings, the density of population has a negative relationship with all expenditures except expenditure on police and fire protection. In contrast, increased urbanisation is often associated with increased expenditure except in the case of higher education, highways and natural resources. The high income states spent more on almost all functions. Thus, variation in population density, degree of urbanisation and per-capita income explain a considerable amount of variation in per-capita state and local government expenditure among the states.

Ernest Kurnow's\textsuperscript{17} model explains more satisfactorily the variability in per capita state and local expenditure of the United States in 1952 than either Fisher's or Fabricant's study. In order to improve the predictive ability of the model, one more variable is introduced namely, federal grants-in-aid, and the four variables employed are per-capita personal income, degree of urbanisation, per-capita federal aid and student teacher ratio. According to the findings, for every 10 per cent increase in per-capita income, there is 5.6 per cent increase in per capita expenditure and degree of urbanisation; federal grants also have the same positive relationship, while the student-teacher ratio has a negative relationship with expenditure.
Bird\textsuperscript{18} has suggested that the positive theory of public expenditure for present purposes may be considered to encompass the study of the following subjects: (i) the determinants of the volume of public expenditure, (ii) the determinants of composition of public expenditure, i.e., what goods and services are financed through the public sector and how the size of expenditure changes over time, and (iii) behavioural properties of public expenditure such as centralisation and stability.

Lall\textsuperscript{19} has established a relationship between per capita income and expenditure disaggregated as current economic services, health services and agriculture, in forty-six developing countries by using cross-section data. The countries have been divided into three groups on the basis of their per capita income. His study shows that there is no significant relationship between per capita Gross National Product and total government expenditure expressed as per cent of Gross Domestic Product. The changes in per capita income explain a relatively smaller part of the changes in government expenditure.

Mewwally and Mohamoud\textsuperscript{20} offer a cross-country analysis, classifying the countries of the world into low-income developing economies, lower-middle income developing economies, upper-middle-income developing economies, high-income oil exporters, and developed industrial market
economies on the basis of per capita income. The study examines the effect of the stage of development on the relationship between the country's size and its expenditure and tests for economies of scale with respect to total expenditure as well as different types of expenditure as defence, education, health, housing amenities, social security, welfare and economic services. His main findings are: (i) the higher the stage of development, the larger the amount of total gross national product absorbed by total expenditure on government services; (ii) The ratio of total expenditure on government services does not vary with the country's size as measured by population; (iii) per capita total expenditure is correlated with income per capita only in the middle income developing countries. Lotz analyses variation in the composition and size of government expenditure among thirty-seven developing countries and the factors which influence government expenditure decisions by using cross-section data. He classifies expenditure into economic services, education and health, social welfare and defence, and relates these types of expenditure with six socio-economic variables, namely per capita income, per cent of population living in urban areas, exports of minerals and oil as per cent of Gross National Product, literacy rate, and notes and coins per capita. He finds a closer relationship between welfare expenditure and degree of urbanisation, literacy, per capita income and degree of
monetisation. Besides, education and health expenditure is closely related to openness and per capita income. The defence expenditure and per capita income are found to have a negative relationship.

Martin and Lewis\textsuperscript{22} have analysed the size and composition of public expenditure and revenue for 16 countries, which are classified as developing and developed countries. The expenditure is classified into revenue and capital expenditure, and the study shows that the richer countries have a higher revenue expenditure relative to Gross National Product (GNP). Kuznet\textsuperscript{23} does not support Martin-Lewis' findings that high income countries spend more on defence relative to Gross National Product than the low income countries. He also establishes a positive relationship between per capita income and the current transfers in different countries.

Richard Thorn\textsuperscript{24} has found that the percentage of Central government expenditure in Gross National Product (GNP) and the proportion of social expenditure to total government expenditure are positively correlated to per capita income in developing countries. Ferris\textsuperscript{25} identifies public spending pattern for several categories, education, welfare, housing, health, highways and defence. Based on the data 1973 by taking into consideration variables like tax, price, household income, education, poverty level
income and number of cars. This is an attitudinal approach based on demand.

Leuthold\textsuperscript{26} model is a median voter model used to predict the state spending for the fiscal year 1985 in the state of Illinois. State public expenditure is classified into four major categories namely, human services, elementary and secondary education, higher education, and health services. The important explanatory variables are median income and median tax share, total population, school age population, young adult population, income per capita and income growth. The study shows that in the human services, income per capita and income growth are important, and that an increase in these variables results in a reduction in the share of this expenditure. The size of the school age population has a strong positive influence on the total education expenditure. The share of the health service expenditure is related to the size of the resident population.

Mann and Schulthuses\textsuperscript{27} have carried out an analysis of expenditure determination in Argentina's public spending during the period 1930-1977. Public expenditure has been disaggregated into i) current expenditure on (a) wages and salaries, (b) impersonal goods and services, c) transfer to families, and ii) capital expenditure. The explanatory variables under four broad concepts are:
1) Under economic factors - i) real Gross Domestic Product per capita, ii) ratio of imports to Gross Domestic Product, iii) ratio of Exports to Gross Domestic Product, iv) foreign trade co-efficient, v) manufacturing sectoral share of Gross Domestic Product, and vi) agricultural sectoral share of Gross Domestic Product; 2) Under monetary factors - i) money supply, and ii) inflation rate, and 3) Under financial factors - i) total tax revenue, ii) personal income tax revenue, iii) per capita personal income tax revenue, and iv) share of personal income taxes in total tax revenue, and 4) Under political factors - i) president elected by popular vote or not, ii) civilian or military president, and iii) year in which new president took office. Thus this analysis covers all the economic, financial, monetary and political factors to predict the changes in the expenditures of the State. The main findings of this model are that real per capita Gross Domestic Product tends to pull the expenditure output ratio upward while the tax revenue and non-elected government acts in the opposite direction, whereas the civilian and popularly elected government administration tends to increase the spending levels. The rate of inflation influences the expenditure output ratio both inversely and directly. The revenue also influences capital expenditure. There is a direct relationship between real Gross Domestic Product per capita and the transfer share of Gross Domestic Product. According to this model, rate of
economic growth based on Gross Domestic Product, political factors and rate of inflation mainly influence the public spending of Argentina.

Landau\textsuperscript{28} establishes a relationship between share of government consumption expenditure in Gross Domestic Product and the rate of growth of real per capita of Gross Domestic Product in nearly 104 countries of the world classified as high income, middle income, low income, and Third world countries including oil producers during 1961-1972. The study shows that there is a negative relationship between the share of government consumption expenditure in Gross Domestic Product and the rate of growth of per capita Gross Domestic Product in all these countries. Higher government expenditure and investment in education explain the slow growth of low income countries. There is also a positive relationship between total investment in education and the growth rate, according to this study.

The growth of government is explained by Muller\textsuperscript{29} in a public choice perspective, i.e., the economic analysis of political institutions in the United States during 1929-1982. Meltzer and Richard\textsuperscript{30} have also presented a public choice analysis where the role of the median voter is emphasised in the growth of government.

Sohrab Abizadeh and Mahmood Yousefi\textsuperscript{31} empirically examine the secular growth of federal government expenditure
in Canada using both political and economic variables. The expenditure is classified as exhaustive and non-exhaustive, and again as expenditure in real or nominal terms. This study takes into consideration both economic and political variables like, internationally induced economic change, dependency ratio, rate of unemployment and the growth in real income. The study shows that in Canada, the use of real or nominal data does not change the results. The use of exhaustive and non-exhaustive measures of the size of government significantly changes the results, which indicates that factors affecting exhaustive expenditures are not necessarily the same as those which affect non-exhaustive measures. Internationally induced economic changes have influenced significantly the growth of government. The results also show that larger the dependency ratio, the higher the federal government's expenditure on social goods and services. The higher the rate of unemployment, the higher the growth of government expenditure in the next period. The more liberal' the leader of the party in power the larger will be the size of public spending. Finally, the growth in real income is accompanied by higher government expenditure. Thus, the above study considers both economic and political variables that determine public spending in Canada.

Morss, Fredland and Hymans specify certain economic, demographic and political factors which have a
short run impact on the expenditure pattern of the
governments of 48 states in the United States during
1951-1962. The dependent variables are total expenditure
and capital expenditure, and the explanatory variables
influencing this expenditure are budgetary deficit,
population, per capita state debt, and political factors.
The findings show the importance of financial variables in
the case of capital expenditure. In addition, inter-party
competition and the degree of co-operation between
legislature and governor have an important impact on
expenditure behaviour. This study implies that for
understanding the determinants of state expenditure a
disaggregated study of the political and institutional
environments of individual states is necessary.
Sharansky 33 and Fisher 34 also emphasise the influence of
political variables in the expenditure determinant studies
by segregating the effect of regional factors and political
factors of index of two party competition at state and local
level expenditure respectively.

The above international studies on expenditure
determinants have analysed the influence of economic,
demographic, financial, monetary, and political factors on
the expenditure of national, state and local governments.
However, most of the studies in India have concentrated on
the growth and pattern of public expenditure and a very few
studies on this aspect of expenditure determinants. Mathews has analysed the pattern of expenditure during 1937-1956 in the Indian Union and examined the significance of government policies in the changing expenditure pattern. Mukherjee has established a theoretical link between aggregate economic activity and the activity of the public sector. Sir Purushotamdas Thakuradas Research Wing Study presents a factual study of the finances of government of India from 1950-51 to 1964-65. Panchmukhi examines the effects of expenditure on education and health, the knowledge of which is essential for making rational decisions in policy making.

Following Peacock and Wiseman, Reddy has presented an analysis of the growth of public expenditure in India from 1872 to 1968 and examined it in relation to national income, and also tested the hypothesis of Wagner in the Indian context. In his second study, he has analysed the growth of public sector employment and identified the variation in public sector expenditure from state to state. He explains the variance in terms of per capita federal transfers.

Gupta has evaluated the effect of Central Government expenditure on income redistribution and generation of employment opportunities in 1977. Zahir has also followed the same income redistribution in Indian
public expenditure analysis. Madalgi has presented the trend and growth in state government expenditure of the Indian states from 1951-52 to 1965-66. His study is confined only to revenue expenditure. Thimmaiah and Nanjundappa have also made inter-state comparison in state expenditures and analysed the growth and expenditure of state governments. Nanjegowda has examined impact of public expenditure on the growth process and on the feedback effects on tax revenues necessary to finance it in the State of Karnataka. Thus, all these studies have focussed only on the growth trend and pattern of expenditure in India and Indian states.

Datta has examined the determinants of expenditure in the economy of West Bengal during 1951-52 to 1973-74. He has classified expenditure into total expenditure, revenue, capital and non-developmental expenditure, on both accounts and both in aggregate and per capita terms. The explanatory variables are per capita income, the degree of urbanisation, financial transfers from the centre to the state, expenditure on debt services, per capita revenue, etc. The findings show that the influence of per capita income is significant on total expenditure on both accounts.

Ranjana attempts to explain the expenditure behaviour of the government of Rajasthan during 1954-55 to
1974-75 by considering two dependent variables namely, per capita total expenditure and per capita capital expenditure. The set of explanatory variables represents percentage of scheduled caste and scheduled tribe population, per capita income, density of population, percentage of urban population, per capita federal aid, percentage of employees in public sector and per capita debt. According to her findings, percentage of urban population, per capita income, and percentage of employees in public sector are the variables which explain the variations in per capita capital expenditure significantly, while percentage of scheduled caste and scheduled tribe, per capita federal aid, and percentage of employees in public sector variables explain the variation in per capita total expenditure in a significant way. Rao has identified the factors that cause change in tax revenues and non-plan revenue expenditures in four Indian states, namely Karnataka, Orissa, West Bengal, and Kerala. The independent factors are per capita income, percentage of primary sectoral income, and price index for working class in the states. Besides these economic variables, change of political parties in power is included through the dummy variable technique. The main findings of this study are: (i) in all the four states, the growth of expenditure is due to the increased cost of providing them; (ii) In Kerala and West Bengal, the level of expenditure is not influenced by the
economic variables; and (iii) Less stable government results in significantly higher level of expenditure, particularly in social and economic services. The ideological leanings of the parties in power have not been found to affect significantly the level of expenditure in the states.

These expenditure determinant studies show that factors influencing expenditure are not examined in depth either on macro or on micro level, particularly in the Indian context. Further, most of the Indian studies are based on cross section analysis and confine themselves to only a few items of expenditure. Thus, the review of the above studies reveals the following gaps in the current literature of determinants of public expenditure in the Indian context:-

i) Causal relationship between tax revenue and expenditure of Indian states has not been verified empirically.

ii) The political, economic and demographic factors are not considered together to identify the determinant factors of each item of public expenditure in Indian States.

iii) There are vast changes in the political scenario and the expenditure policies of the state governments.
In this area also, attempts have not been made to identify the impact of political instability on public expenditure.

1.3 OBJECTIVES OF THE PRESENT STUDY

In view of these gaps in determining the states' expenditure the present study has the following objectives:-

i) To inquire into the role of finance commissions in the transfer of resources from the Centre to the State governments.

ii) To examine the trend and pattern of expenditure of Indian states under different functional classifications.

iii) To elucidate the causal relationship between tax revenue and total expenditure and disaggregated total expenditure as capital and revenue expenditure with tax revenue.

iv) To identify the factors influencing each item of expenditure of Indian states over the period 1969-70 to 1988-89.

v) To examine how far the political variables significantly influence each item of expenditure across Indian states and also to identify the
changes in the factors influencing each item of expenditure at different points of time.

1.4 METHODOLOGY

To test the causal relationship between tax revenue and expenditure of all Indian states and the total expenditure disaggregated as capital and revenue expenditure with tax revenue of states, Granger\textsuperscript{50} and Sims\textsuperscript{51} Causality Tests are used.

Let $R_t$(tax revenue) and $E_t$(expenditures) be jointly covariant stationary with $\bar{R}_t$ and $\bar{E}_t$ representing all past values, and $R^*_t$ and $E^*_t$ all past and present values of each. Also, let $\sigma^2(E_t/Z)$ be the minimum error variance or prediction $E_t$ given $Z$ which is composed of any combination of $\bar{R}_t$, $\bar{E}_t$, and $R^*_t$. Taking note in the opposite direction, the four situations may be defined as follows:-

(1) If $\sigma^2(E_t/E_t, \bar{R}_t) < \sigma^2(E_t/E_t)$, then $R$ causes to $E$, that is "Inclusion of past $R$ in the set of values upon which the prediction of $E$ is conditioned lowers the minimum predictive error variance"\textsuperscript{52}, (2) If $\sigma^2(E_t/E_t, R^*_t) < \sigma^2(E_t/E_t, R_t)$, then $R$ instantaneously causes $E$. (3) If situation (1) holds for both directions (i.e. $R$ causes to $E$, and vice versa), then the feedback effect is said to be present. (4) If neither the inclusion
of $R_t$ and $R^*_t$ improve the prediction of $E_t$ and vice versa, then $R$ and $E$ move independently. For a simple bivariate model these patterns of causality can be identified by estimating regressions of $R$ and $E$ on all the relevant variables including current and past values of $R$ and $E$ respectively, and by testing the appropriate hypothesis with the application of Granger and Sims Test. The Granger Test is specified in the following model.

\[ E_t = a_0 + \sum_{i=1}^K b_k E_{t-k} + \sum_{i=1}^I c_i R_{t-i} + e_t \quad \ldots \ldots \ldots (1) \]

\[ R_t = \alpha_0 + \sum_{i=1}^K B_k R_{t-k} + \sum_{i=1}^I \gamma_i E_{t-i} + \epsilon_t \quad \ldots \ldots \ldots (2) \]

where $e_t$ and $E_t$ are mutually uncorrelated.

(1) and (2) are estimated and the null hypothesis is tested that $c_i = \gamma_i = 0$ for all $i(i=0,1,2,\ldots,n)$ against the alternative hypothesis that $c_i \neq 0$ and $\gamma_i \neq 0$ for at least some $i$'s.

The Sims test (1972) follows the logic that the future cannot cause the past. The causation between $X_t$ and $Y_t$ may be identified by estimating the following equation:

\[ Y_t = \beta + \sum_{i=-m}^m a_i X_{t-i} + v_{1t} \]

\[ X_t = \alpha + \sum_{j=-n}^n b_j Y_{t-j} + v_{2t} \]
Under the maintained hypothesis $X_t$ causes $Y_t$.

(i) $\sum_{i=-m}^{m} a_i (i < 0) = 0$

(ii) $\sum_{j=-n}^{n} b_j (j < 0) \neq 0$

for bi-directional causality (feedback) between the two variables, it is to be satisfied that $\sum a_i (i < 0) = 0$ and $\sum b_j (j < 0) = 0$. The condition of independence is that $\sum_{i=-m}^{m} a_i (i < 0) \neq 0$ and $\sum_{j=-n}^{n} b_j (j < 0) \neq 0$.

Generally, the F test is quite sensitive to the presence of auto-correlation among the residuals. Hence, the causality test is also examined with the help of filtering the time series data. Sims (1972) used a filter $(1-0.75 L)^2$ when $LR_t = LR_{t-1}$ and claimed that "this filter approximately flattens the spectral density of most economic time series". 53

In order to identify the factors influencing the aggregate expenditure of Indian states under different heads over a period of time, first the log linear multiple regression model is applied.

$$\ln Y_{jt} = B_{0i} + \sum_i \sum_j B_{ij} \ln X_{ijt} + e_{ji}$$

Where $i = 1, 2, \ldots, 9$

$j = 1, 2, \ldots, 14$
<table>
<thead>
<tr>
<th>Symbol</th>
<th>Description</th>
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<tbody>
<tr>
<td>( t )</td>
<td>sample period</td>
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<tr>
<td>( Y_1 )</td>
<td>Total capital expenditure</td>
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<td>( Y_2 )</td>
<td>Development capital expenditure</td>
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<td>( Y_3 )</td>
<td>Capital expenditure on Agriculture</td>
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<td>( Y_4 )</td>
<td>Capital expenditure on Industry</td>
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<td>( Y_5 )</td>
<td>Capital expenditure on Public Health</td>
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<td>( Y_6 )</td>
<td>Non development capital expenditure</td>
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<tr>
<td>( Y_7 )</td>
<td>Total revenue expenditure</td>
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<td>( Y_8 )</td>
<td>Development revenue expenditure</td>
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<td>( Y_9 )</td>
<td>Revenue expenditure on Agriculture</td>
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<td>( Y_{10} )</td>
<td>Revenue expenditure on Industry</td>
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<tr>
<td>( Y_{11} )</td>
<td>Revenue expenditure on Public Health</td>
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<td>( Y_{12} )</td>
<td>Revenue expenditure on Education</td>
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<tr>
<td>( Y_{13} )</td>
<td>Non-development revenue expenditure</td>
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<tr>
<td>( Y_{14} )</td>
<td>Expenditure on Administrative Services</td>
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<tr>
<td>( X_1 )</td>
<td>Total tax revenue</td>
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<tr>
<td>( X_2 )</td>
<td>Grants-in-Aid</td>
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<tr>
<td>( X_3 )</td>
<td>Total debt of the state</td>
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<tr>
<td>( X_4 )</td>
<td>Percentage of primary sectoral contribution</td>
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<tr>
<td>( X_5 )</td>
<td>Literacy rate</td>
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<tr>
<td>( X_6 )</td>
<td>Density of Population</td>
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<tr>
<td>( X_7 )</td>
<td>Percentage of urban population to total population</td>
</tr>
<tr>
<td>( X_8 )</td>
<td>Percentage of Scheduled Caste and Scheduled Tribe to total population</td>
</tr>
<tr>
<td>( X_9 )</td>
<td>National Income at current prices</td>
</tr>
</tbody>
</table>
Zellner's seemingly unrelated regression model (SUR) is applied to obtain better estimates and to identify the significant groups of determinants among the explanatory variables on each item of expenditure, the following steps are followed:

i) Compute $S_{ij}$ from the ordinary least square residuals and obtain $\mathcal{Z}^{-*}$

Where

$$S_{ij} = \frac{e_i e_j}{(n-k_i)^{1/2} (n-k_j)^{1/2}}$$

Where $k_i$ denotes the number of columns in $x_i$ and

ii) Compute the elements of $\mathcal{Z}^{-1}$ and substitute it in the following

$$\sigma_{11} x_1' x_1 \quad \sigma_{12} x_1' x_2 \quad \ldots \quad \sigma_{1m} x_1' x_m$$
$$\sigma_{21} x_2' x_1 \quad \sigma_{22} x_2' x_2 \quad \ldots \quad \sigma_{2m} x_2' x_m$$
$$\vdots$$
$$\sigma_{m1} x_m' x_1 \quad \sigma_{m2} x_m' x_2 \quad \ldots \quad \sigma_{mm} x_m' x_m$$

And substitute it in

$$\mathcal{N}^{-*} = \begin{bmatrix}
\sigma_{11} & \sigma_{12} & \ldots & \sigma_{1m} \\
\sigma_{21} & \sigma_{22} & \ldots & \sigma_{2m} \\
\vdots & \vdots & \ddots & \vdots \\
\sigma_{m1} & \sigma_{m2} & \ldots & \sigma_{mm}
\end{bmatrix}$$

$$\mathcal{N} = \begin{bmatrix}
\mathcal{W}_1 \\
\mathcal{W}_2 \\
\vdots \\
\mathcal{W}_m
\end{bmatrix}$$

$$\mathcal{W}_i = \begin{bmatrix}
\mathcal{W}_{i1} \\
\mathcal{W}_{i2} \\
\vdots \\
\mathcal{W}_{im}
\end{bmatrix}$$

$$\mathcal{W}_{ij} = \begin{bmatrix}
\sigma_{1j} x_1' y_j \\
\sigma_{2j} x_2' y_j \\
\vdots \\
\sigma_{mj} x_m' y_j
\end{bmatrix}$$
iii. Using $b_x$, compute a new set of residuals $e_x = y - Xb_x$

iv. Partition $e_x$ in the subvectors corresponding to each equation and use these subvectors to compute new $S_{ij}$, thus starting the process all over again.

In order to examine how far the political variables will influence each item of expenditure across Indian states and to identify the changes in influencing factors of each item of expenditure at different points of time, log linear multiple regression model is used

\[
\begin{align*}
\log Y_i &= a + b_1 \log x_1 + b_2 \log x_2 + b_3 \log x_3 + b_4 \log x_4 + b_5 \log x_5 + b_6 \log x_6 + b_7 \log x_7 + b_8 \log x_8 + b_9 \log x_9 + e_i \quad \text{and} \\
\log Y_i &= \alpha + B_1 \log x_1 + B_2 \log x_2 + B_3 \log x_3 + B_4 \log x_4 + B_5 \log x_5 + B_6 \log x_6 + B_7 \log x_7 + B_8 \log x_8 + B_9 \log x_9 + B_{10} \log x_{10} + u_i
\end{align*}
\]

Where

$Y_1$ = Per capita capital expenditure  \\
$Y_2$ = Per capita development capital expenditure  \\
$Y_3$ = Per capita capital expenditure on Agriculture  \\
$Y_4$ = Per capita capital expenditure on Industry  \\
$Y_5$ = Per capita capital expenditure on Public Health  \\
$Y_6$ = Per capita non-development capital expenditure
\[ Y_7 = \text{Per capita revenue expenditure} \]
\[ Y_8 = \text{Per capita Development revenue expenditure} \]
\[ Y_9 = \text{Per capita revenue expenditure on Agriculture} \]
\[ Y_{10} = \text{Per capita revenue expenditure on Industry} \]
\[ Y_{11} = \text{Per capita revenue expenditure on Public Health} \]
\[ Y_{12} = \text{Per capita revenue expenditure on Education} \]
\[ Y_{13} = \text{Per capita Non-development capital expenditure} \]
\[ Y_{14} = \text{Per capita expenditure on Administrative Services} \]
\[ X_1 = \text{Per capita tax revenue} \]
\[ X_2 = \text{Per capita grants-in-aid} \]
\[ X_3 = \text{Per capita debt of the state} \]
\[ X_4 = \text{Percentage of primary sectoral contribution} \]
\[ X_5 = \text{Literacy rate} \]
\[ X_6 = \text{Density of population} \]
\[ X_7 = \text{Percentage of urban population to total population} \]
\[ X_8 = \text{Percentage of Scheduled Caste and Scheduled Tribe to total population} \]
\[ X_9 = \text{Per capita income at current prices} \]
\[ X_{10} = \text{Dummy variable i.e., '1' for congress-ruled states and '0' for non-congress ruled states.} \]

1.5 DATA SOURCE

The present study is purely based on secondary data. The data used in the above models are obtained from various sources, i.e., Reserve Bank of India

1.6 PERIOD OF STUDY

The present study covers a period of 20 years from 1969-70 to 1988-89 to identify the causality between tax revenue and public expenditure of Indian states and the same period is also selected to examine the factors determining aggregate expenditure of states under different heads. The year 1969 is selected as the base year as it was the beginning of the fourth five-year plan. In order to identify the influence of political variables and to examine variation in factors influencing each item of expenditure across Indian states at different points of time, the years selected for the study are 1969-70, 1980-81, and 1988-89.

1.7 AREA OF STUDY

The study area covers twenty-two Indian states viz., Andhra Pradesh, Assam, Bihar, Gujarat, Haryana,
Himachal Pradesh, Jammu & Kashmir, Kerala, Karnataka, Madhya Pradesh, Maharashtra, Manipur, Meghalaya, Nagaland, Orissa, Punjab, Rajasthan, Sikkim, Tamil Nadu, Tripura, Uttar Pradesh and West Bengal.

1.8 SCOPE AND LIMITATIONS

In order to verify the causal relationship between the expenditure and tax revenue and disaggregated expenditure into capital and revenue expenditure with total tax revenue, the causality test is employed. The present study is the first of its kind in India to employ SUR model in identifying the determinants of each item of expenditure of Indian states. Also the study employs the economic, demographic and political factors influencing public expenditure. Further, both time series and cross-section data are used for the study. However, the present study is subject to the limitations of aggregation of expenditure of all Indian states. It is also limited to the extent of the heterogeneous characters of the Indian states. In addition, the study is also subject to the assumptions of the classical linear regression model. Finally, it is also restricted to the extent of explanatory variables selected for identifying the factors influencing each item of expenditure.
1.9 PLAN OF STUDY

The present study comprises seven chapters.

Chapter one deals with the problems, objectives, methodology, review of literature, scope and plan of the study.

Chapter two examines the role of finance commissions in intergovernmental transfer of resources.

Chapter three deals with the trend, pattern and growth of each item of expenditure of Indian states.

Chapter four examines the causal relationship between expenditure and tax revenue and total expenditure disaggregated as capital and revenue expenditure with tax revenue.

Chapter five identifies the determinants of each item of expenditure of Indian states taken together over the period 1969-1970 to 1988-1989.

Chapter six deals with variations in the determining factors on each item of expenditure of Indian states at different points of time, viz. 1969-70, 1980-81, and 1988-89.

Chapter seven sums up the findings and makes a few recommendations.
NOTES AND REFERENCES


34. Fisher, Glenn, W., op.cit., p.353.


37. Ibid., p.20.


51. Sims, op.cit., p.543.

