Incurrence of public expenditure is a necessity for any government to perform a variety of its functions for welfare of the society, for which public revenue is required to be generated. Public revenue holds the same status in the study of public finance, which production holds in the study of micro economics.

Income of a government through all its sources is called public income or public revenue. It includes income from taxes, prices of goods and services supplied by public enterprises, revenue from the administrative activities (such as fees, fines, etc.), gifts and grants. Dalton (1971) has made a clear distinction between public revenue and public receipts; public receipts include all the incomes of the government which it may have during a given period of time. That is, public receipts equal public revenue plus income from all other sources, such as public borrowings from individuals and banks (or Central Bank) and issue of paper currency. As regards various sources of revenue, these include Tax Revenue (such as Commercial Revenue, on Income, Commodities and Services, Property, etc.) and Non-Tax Revenue (such as Administrative Revenue, Revenue from General, Social, Fiscal & Economic Services, Grants from the Centre, etc.).

Since a large majority of developmental activities in the field of social infrastructure, agriculture, irrigation, power, rural infrastructure, etc. fall under the purview of the concerned states, expenditure of the state governments has been ever increasing to finance these activities. Besides, salaries, pensions, other incentives to the employees and interest money on state’s loans are multiplying. However, as it appears, requisite finance for undertaking developmental programmes has not been growing commensurately. In other words, functions of different states and expenditure of state governments have been increasing, thereby leading to widening of gap between expenditure and revenue. Since fiscal health of the Indian states, in general, and that of Punjab, in particular, has been far from being satisfactory; therefore, In this context, the present study aims to examine as to what are the likely forces which are primarily responsible for inducing deterioration in the fiscal health
of Indian sates. This also might assist us in suggesting suitable remedial measures to come out of the above mentioned problem. Although, the reviewed literature indicated towards the availability of a number of related studies, yet no exhaustive study seems to have been carried out in the context of the Indian states in the recent past. This called for the need to undertake the present elaborative study with the following specific objectives:

1. To perform a descriptive analysis of the recommendations of recent Finance Commissions of India;
2. To examine growth performance and structural transformations in tax and non-tax revenue generated among major Indian states;
3. To measure the extent of Fiscal Deficit; gauge the severity of instability therein and identify the major concomitants of the deficit at the sub-national level;
4. To estimate buoyancy of tax and non-tax revenue, and examine differentials, if any, among the states;
5. To examine the prevalence, or otherwise, of long-run sustainability among Fiscal Deficit, Public Debt and Interest Payments among the Indian states;
6. To examine inter-relationships, if any, between the pattern of development and fiscal health of the Indian states; and
7. To examine convergence, if any, among the Indian states in respect of different dimensions of their fiscal health vis-à-vis their income.

Hypotheses Tested:

The hypotheses tested in the study were framed as follows:

1. Different components of revenue have temporally grown at comparable rates among the different Indian states;
2. Fiscal Deficit has undergone temporal changes among the major Indian states in a fairly consistent manner;
3. Liberalization Policy Regime has significantly helped in improving both tax and non-tax buoyancy coefficients at the sub-national level;
4. There is an absence of long-run sustainability between Fiscal Deficit, Public Debt and Interest Payments among the Indian states;
5. Fiscal Deficit is closely associated with the pattern of development in both rural and urban regions at the sub-national level;

6. There has been temporal convergence in different dimensions of revenue, expenditure and certain other related macroeconomic aggregates among the Indian states.

In order to get assistance towards formulation of the methodology in the present investigation, as also to fill certain gaps in the existing literature, more than 80 relevant studies were duly reviewed.

**Data Base:**

Basically, it was an empirical investigation, for which state-wise time series secondary information for 28 Years (from 1984-85 to 2011-12), both at current and at constant prices, had to be compiled on a multiplicity of aggregates from various secondary sources. Some such sources were: Various issues of Reserve Bank of India Bulletin, States’ and National Accounts of the Ministry of Statistics and Programme Implementation, Reports of Census of India, Reports of various Finance Commissions of India, Reports of Different Rounds of National Sample Surveys Organization, etc. Besides that, a number of websites were also accessed for compilation of requisite data. Information was compiled on: Thirty five components of revenue; eleven components of revenue expenditure; six aggregates for estimating Fiscal Deficit; one component of Public Debt; twenty four components of GSDP (at both Current and Constant Prices); and eight components of Work Force. We may mention that certain components had to be grouped/merged together, depending upon the nature of the aspect considered. Various components on which the information was compiled for the accomplishment of above said objectives were as follows:

**Components of Revenue Receipts:**

No doubt, there were originally 67 components of revenue receipts, but the information on all the components were not uniformly available for all the states. Therefore, we had to merge certain components suitably so as to get information on the clubbed components for all the 17 major Indian states for 28 years’ period (1984-85 to 2011-12). The so-obtained components were: (1) Tax Revenue (TXR)
which includes State’s Own Tax Revenue and Share in Central Taxes]; (1.1) State’s Own Tax Revenue (STR) [which includes Taxes on Income, Taxes on Property & Capital Transactions, Taxes on Commodities & Services]; (1.1.1) Taxes on Income (TOI) [which includes Agriculture Income Tax and Taxes on Professions, Trades, Callings & Employment]; (1.1.2) Taxes on Property and Capital Transactions (TPC) [which includes Land Revenue, Stamps and Registration Fees]; (1.1.2.1) Land Revenue (LRV); (1.1.2.2) Stamps and Registration (SRF); (1.1.3) Taxes on Commodities and Services (TCS) [which includes Sales Tax, State Sales Tax/VAT, Central Sales Tax, Surcharge on Sales Tax, Receipts of Turnover Tax, Other Receipts, State Excise, Taxes on Vehicles and Taxes & Duties on Electricity]; (1.1.3.1) Sales Tax (SLT) [which includes State Sales Tax/VAT, Central Sales Tax, Surcharge on Sales Tax, Receipts of Turnover Tax and Other Receipts]; (1.1.3.2) State Sales Tax/VAT (SST); (1.1.3.3) Central Sales Tax (CST); (1.1.3.4) State Excise (STE); (1.1.3.5) Taxes on Vehicles (TOV); (1.1.3.6) Taxes and Duties on Electricity (TDE); (1.2) Share in Central Taxes (SCT); (2) Non-Tax Revenue (NTR) [which includes State’s Own Non-Tax Revenue, Interest Receipts, Dividends and Profits, General Services, Social Services, Economic Services and Grants from the Centre]; (2.1) State’s Own Non-Tax Revenue (SNR) [which includes Interest Receipts, Dividends & Profits, General Services, Social Services, Economic Services]; (2.2) Interest Receipts (INR); (2.3) Dividends and Profits (D&P); (2.4) General Services (GNS); (2.5) Social Services (SCS) [which includes Education, Sports, Art & Culture, Medical & Public Health, Family Welfare, Housing, Urban Development, Labour & Employment, Social Security & Welfare, Water Supply and Sanitation and Others]; (2.6) Economic Services (ECS) [which includes Crop Husbandry, Animal Husbandry, Fisheries, Forestry and Wildlife, Co-operation, Industries and Others]; (2.6.1) Crop Husbandry (CRH); (2.6.2) Animal Husbandry (ANH); (2.6.3) Fisheries (FSH); (2.6.4) Forestry and Wildlife (FOW); (2.6.5) Co-operation (COP); (2.6.6) Industries (IND); (2.6.7) Others (OTE); (2.7) Grants from the Centre (GFC) [which includes State Plan Schemes, Centrally Sponsored Schemes, Non-Plan Grants, Statutory Grants and Others]; (2.7.1) State Plan Schemes (SPS); (2.7.2) Centrally Sponsored Schemes (CSS); (2.7.3) Non-Plan Grants (NPG); (2.7.4) Statutory Grants (STG); (2.7.5) Others (OTG) and (3) Total Revenue (TOT) [which is the sum total of Tax Revenue and Non-Tax Revenue].
Components of Revenue Expenditure:

(1) Developmental Expenditure (DVEX); (1.1) Expenditure on Social Services (EXSS); (1.2) Expenditure on Economic Services (EXES); (2) Non-Developmental Expenditure (NDEX); (2.1) Expenditure on Organs of State (EXOS); (2.2) Expenditure on Fiscal Services (EXFS); (2.3) Interest Payments & Servicing of Debt (IPSD); (2.4) Expenditure on Administrative Services (EXAS); (2.5) Expenditure on Pensions and Miscellaneous Services (EXPM); (3) Compensation and Assignments to Local Bodies (CALB); and (4) Aggregated Expenditure (AGGE).

Components for Estimating Fiscal Deficit:

(1) Total Revenue Expenditure (TREX); (2) Total Capital Outlay (TCPO); (3) Loans and Advances from State Governments (LASG); (4) Recovery of Loans (RCLN); (5) Total Revenue (TRVN); and (6) Non-Debt Capital Receipts (NDCR).

Components of GDSP:

(1) Primary (PRM); (1.1) Agriculture (AGR); (1.2) Forestry and Logging (FOL); (1.3) Fishing (FSH); (1.4) Mining and Quarrying (MNQ); (2) Secondary (SEC); (2.1) Manufacturing (MFG); (2.1.1) Registered Manufacturing (RGD); (2.1.2) Unregistered Manufacturing (UGD); (2.2) Construction (CON); (2.3) Electricity, Gas and Water Supply (EGW); (3) Tertiary (TRT); (3.1) Tertiary-1 (TR1); (3.1.1) Transport, Storage and Communication (TSC); (3.1.1.1) Railways (RLS); (3.1.1.2) Transport by Other Means (TOM); (3.1.1.3) Storage & Communication (CMS); (3.1.2) Trade, Hotels & Restaurants (THR); (3.2) Tertiary-2 (TR2); (3.2.1) Banking & Insurance (BNI); (3.2.2) Real Estate & Ownership of Dwellings & Business Services (RED); (3.2.3) Public Administration (PAD); (3.2.4) Other Services (OSR); and (4) Aggregated GSDP (AGD).

It may be mentioned that such time series information on Gross State Domestic Product (GSDP) at aggregated/ disaggregated levels were available at factor cost. Further, data on GSDP for each of the states were available differently at 4 base years (viz., 1980-81, 1993-94, 1999-2000 and 2004-05). Therefore, in order to have regular time-series at common base year (viz., 2004-05) for each of the state and for
all the states taken together, split series were suitably spliced by duly making use of the information on overlapping years.

**Components of Work Force:**

(1) Agriculture, Forestry and Fishing (AGFF); (2) Manufacturing and Mining & Quarrying (MNFG); (3) Constructions (CONS); (4) Electricity, Gas and Water Supply (EGWS); (5) Transport, Storage and Communication (TSCM); (6) Trade, Hotels and Restaurants (THRS); (7) Banking, Insurance, Real Estate, Ownership of Dwellings and Business Services (FBRD); (8) General Services (including Public Administration and Defence; GNSR); and (9) Overall Total (AGGD).

Time-series information on work force (Rural, Urban and Total) was compiled for 19 years (from 1993-94 to 2011-2012) through 4 Rounds (viz., 50th (1993-94), 55th (1999-00), 61st (2004-05) and 68th (2011-12)) of NSSO. In respect of each of the economic activity and for a given state, information on work force for the inter-Rounds points in time was obtained through the usual compound growth rates law, so as to generate regular time series on the force. It may also be mentioned here that for computing *per capita income* (real as well as apparent), information on population for each of the states was first compiled at the *four* census years: 1981, 1991, 2001 and 2011 and, then, population figures were obtained for each of the intervening points in time through the above-mentioned compound growth rate law.

**Major states considered for investigation:**

Andhra Pradesh (ANP), Assam (ASM), Bihar (BHR), Gujarat (GUJ), Haryana (HAR), Himachal Pradesh (HMP), Jammu & Kashmir (JNK), Kerala (KRL), Karnataka (KTK), Madhya Pradesh (MDP), Maharashtra (MHR), Odisha (ODS), Punjab (PNB), Rajasthan (RAJ), Tamil Nadu (TND), Uttar Pradesh (UTP), West Bengal (WSB), and All Major States Taken Together (AST).

**Analytical Techniques**

Depending upon nature of analysis in the study, a battery of statistical/ econometric tools and techniques were made use of, as enlisted below:
(A) For the analysis of the recommendations of recent Finance Commissions of India — A Descriptive Treatise, successive growth rates were computed for the comparison of inter se Share of Income Tax and Union Excise Duties among the Indian States using the formula:

\[ \text{SGR}_t = \frac{Y_t - Y_{t-1}}{Y_{t-1}} \times 100 \]

(B) For the analysis of growth performance and structural transformations in tax and non-tax revenue among Indian States, the time series information (at 2004-05 constant prices) in respect of 35 components of revenue were used. For the purpose of long-run behavioural analysis, as many as 14 distinct trend relationships in time variable \( t \) were estimated from each of the data series. These were: Simple Linear (SLR); Parabolic (PRB); Cubic (CUB); Log-Linear (LLN); Log-Parabolic (LPB); Log-Cubic (LCB); Exponential (EXP); Exponential-Parabolic (EPB); Exponential-Cubic (ECB); Geometric (GEO); Hyperbolic (HYP); Modified Exponential (MEX); Gompertz (GOM); and Logistic (LGS). The best-fit path was selected on the basis of the indicator \( I \) due to Sethi (2008). From the so chosen path, relative growth rates were estimated to examine the validity of alternative hypothesis of acceleration, constancy or deceleration in the growth paths. Then following the methodology as outlined in Sethi (2010), turning points, if any, were detected along the growth path and kinked growth rates were estimated on either side of the turning points. Measures \( \theta \) (due to Moore, 1978) and \( \xi \) (due to Sethi, 2003) were also computed to examine the speed of structural changes in Revenue from various economic activities among the Indian States.

(C) For each of the major states and at each of the points in time, measurement of Fiscal Deficit was made through the methodology as adopted by National Institute of Public Finance and Policy (NIPFP) [also mentioned in Dholakia and Karan (2005)]:

\[ \text{FSDF} (\%) = \frac{[(\text{TREX} + \text{TCPO} + \text{LASG}) - (\text{TRVN} + \text{RCLN} + \text{NDCR})]}{\text{GSDP}} \times 100 \]
wherein the full forms of the different aggregates involved (each at current prices) have already been given.

In order to test the equality of mean fiscal deficit among the states, *two-way analysis of variance technique*, duly coupled with Tuckey’s *post-hoc* testing was applied. For measuring the extent of temporal fluctuations in the generated time series on FSDF for each of the 17 major Indian states (as also for the FSDF values pooled over all the states), we have made use of as many as *eight* different indexes of instability. These were: \(I_1\) due to Coppock (1962), which makes use of log-variance approach, assumes a constant percentage change in the values and corrects annual changes for this; \(I_2\) due to Massell (1964), which is average annual percentage rate of change in the value of the component, also trend-correlated; \(I_3\) due to Glezacos (1973), which is the arithmetic mean of the absolute values of the yearly changes in a time-series, duly corrected for linear trend, and expressed as a percentage of the average of all observations; \(I_4\) due to Cuddy and Dellavalle (1978); \(I_5\) due to Ray (1983), which was simply obtained as the standard deviation of natural log of the ratio of successive values of the study variable \(Y\); \(I_6\) due again to Glezacos (1984), which is the arithmetic mean of absolute values of yearly changes in a time-series, duly corrected for log-linear trend, and expressed as a percentage of the average of all observations; \(I_7\) due to Xin and Liu (2008); and \(I_8\), as proposed by Sethi (2014), which was based on CV among moving averages (like the one suggested by Mahendradev, 1987) of *optimum spans*. *Kendall’s Concordance Analysis* was also applied to establish whether there existed compatibility among the ranks (with respect to the extent of instability in fiscal deficit) assigned to the different states.

For making an identification of the major concomitants of fiscal deficit among the states, time series information was also compiled on Relative Share (in GSDP) of each of Primary sector (RSPR), Secondary sector (RSSC), Tertiary-1 sector (RST1), and Tertiary-2 sector (RST2); Relative Share (in Overall Revenue Receipts) of each of States’ Own Tax Revenue (SOTR), Share in Central Taxes (SICT), Non-Tax Revenue (NTRV), and Sales Tax (SLTX); and Relative Share (in Overall Revenue Expenditure) of each of Economic Services (EXES), Social Services (EXSS), Non-Developmental Expenditure (NDEX), and Interest Payments & Servicing of Debt (IPSD). Then, for the identification of the major concomitants of fiscal deficit, we
have made use of step-up Frisch’s (1934) confluence regression analysis, as applied to panel data with both fixed effects and Nerlove’s (1971) version of random effects modelling. For the panel data estimation, we have followed Baltagi (2001), and Croissant and Millo (2008). Significance of difference between the vectors of estimates obtained through fixed and random effects modelling was carried out through Hausman (1978) test. Next, optimum strata boundaries were computed (for both mean values and the extents of instability in fiscal deficit) through the application of ‘cumulative frequency’ method (Singh, 1971), so as to come out with a bi-variate categorisation of the states.

(D) For the measurement of Tax and Non-tax Revenue buoyancies among major Indian states data on three revenue aggregates [viz., Total Revenue (TLRV), Tax Revenue (TXRV), Non-Tax Revenue (NTRV)] and Gross State Domestic Product (GSDP) were used. The period after 1991 was considered as reforms period that was initiated by the Government of India. Before going in for the estimation of buoyancy coefficients, certain other suitable panel-data based econometric analyses were required to be performed: For the purpose of testing stationarity in the time series information, we have used two panel unit root tests, viz., Augmented Dickey Fuller (ADF) test and Philips-Perron (PP) test. In order to detect the presence of long run equilibrium between different aggregates of revenue and GSDP, panel-data based Pedroni’s cointegration analysis was performed. The standard Granger’s causality analysis was then performed to examine presence and direction of causal relationship between revenue and income in the states. For the estimation of Tax Buoyancies during pre- and post-reforms period, we have made use of panel-data based regression analysis with both fixed effects and random effects modelling, by duly making use of dummy variable approach. Finally, we have computed tax and non-tax buoyancies for pre-reforms versus reforms period for each of the major states by following the methodology as adopted by Upender (2008). In simple terms, tax buoyancy was estimated as:

\[ B = \frac{\Delta Y/Y}{\Delta X/X} \]
where \( Y \) stands for historical tax revenue; \( X \) for GSDP; \( \Delta Y \) for incremental tax revenue; and \( \Delta X \) for incremental GSDP.

Tax buoyancy computations from the panel data regression approach were made by estimating the log-linear models (say, in respect of tax revenue), as:

\[
\ln \text{TAXR} = \ln \beta_0 + \beta_1 \ln \text{GSDP} + \beta_2 D + \beta_3 (D \times \ln \text{GSDP}) + u
\]

where \( u \) stands for disturbance term and \( D \) for time dummy (\( = 0 \) for the pre-reforms period and \( 1 \) for the reforms period). Thus, the buoyancy measures would be:

\[
B = \begin{cases} 
\hat{\beta}_1, & \text{during pre-reforms period;} \\
\hat{\beta}_1 + \hat{\beta}_3, & \text{during reforms period.}
\end{cases}
\]

(D) For long run sustainability analysis among debt, deficit, interest, expenditure and income among the Indian states, the aggregates considered were: Fiscal Deficit (FSDF), Public Debt (PBDT), Interest Payments & Servicing of Debt (IPSD), Developmental Expenditure (DVE), Non-Developmental Expenditure (NDE), Expenditure on Social Services (ESS), Expenditure on Economic Services (EES), Aggregated Expenditure (AGE), Gross State Domestic Product (GSDP) and GSDP Deflator (DEFT). In line with the basic model of Domar (1944), first part of the analysis was based upon the rates of growth in the aggregates, followed by estimation of critical values of Fiscal Deficit for examining fiscal sustainability. In the second part, we once again were required to perform at the outset, certain suitable panel-data based econometric analyses: For the purpose of testing stationarity in the time series information, we have used two panel unit root tests, viz., Augmented Dickey Fuller (ADF) test and Philips-Perron (PP) test. In order to detect the presence of long-run equilibrium between different aggregates of revenue and GSDP, panel-data based Pedroni’s cointegration analysis was performed. The standard Granger’s causality test was then performed to examine presence and direction of causal relationship between the aggregates considered. Finally, we have applied panel-data based Vector Autoregression Analysis (VAR) for studying interdependencies among the three aggregate
(E) For examining interrelationship between Pattern of Development vis-a-vis Fiscal Health of Indian states, eight components in respect of GSDP and work force were used. These were: Agriculture, Forestry and Fishing (AGFF), Manufacturing (MNFG), Constructions (CONS), Electricity, Gas and Water Supply (EGWS), Transport, Storage and Communication (TSCM) [which includes Railways, Transport by other means], Trade Hotels and Restaurants (THRS), Banking, Insurance, Real Estate, Ownership of Dwellings and Business Services (FBRD), and General Services (GNSR) [which also includes Public Administration and Other Services]. First we estimated employment elasticities to measure the intensity of work force engaged in major economic activities using the formulation: 
\[ \ln(E_i) = \beta_0 + \beta_1 \ln(Y_i) + u_i \]
and then Index of Structural Imbalance (due to Sethi, 2002): 
\[ \xi = 1 - e^{-\frac{E}{\sum_i s_i \ln s_i}} \]
where \( E \) refers to the ratio of relative share of the \( i \)th economic activity in GSDP to that in work force. Two-way ANOVA was also performed to examine differentials in the extent of structural imbalance among the states; and finally to study if the structural imbalance had any nexus with the FSDF, or not, Panel-data based step-down multiple linear regression analysis, coupled with the computation of AIC and Hausman’s test was applied.

(F) For the analysis of convergence among the Major Indian States with respect to different dimensions of their fiscal health vis-a-vis their income, specifically nine aggregates considered were: Fiscal Deficit (FSDF), Total Revenue-GSDP ratio (TLGP), Tax Revenue- GSDP ratio (TXGP), Non-Tax Revenue-GSDP ratio (NTGP), Public Debt (PBDT), Interest Payments & Servicing of Debt (IPSD), Developmental Expenditure (DVEX), Aggregated Expenditure (AGGE) and Per Capita Income (PCIN). For examining the nature of convergence among the Indian states two alternative approaches were applied: \( \alpha \)-convergence, by estimating CV among log of the aggregates under study; and \( \sigma \)-convergence, wherein the concept of standard deviation (rather than CV) was used. For examining speed, two types of \( \beta \)-convergence analysis (unconditional and conditional) was performed, wherein rate of growth in a given aggregate was regressed upon log of base period’s value of the aggregate (Barrow and Sala-i-Martin,1992).
It may be mentioned that the analytical computations in almost entirety were made through a variety of the computer software developed / suitably adapted in R-language by my respected teacher, Prof (Dr) Amarjit Singh Sethi.

Chapter Scheme:

The study has been organized into a totality of eleven chapters. The first chapter is devoted to introduction to the problem, highlighting orientation, objectives of the study, hypotheses to be tested, etc. The second chapter presents a detailed review of the related studies of general nature, as the studies directly related with a given objective have been presented in the corresponding chapter. Chapter-III outlines the data base for the study. A descriptive analysis on the basis of recommendations of recent Finance Commissions of India (viz., 9th to 14th) has been performed in Chapter-IV. Growth performance and structural transformations in Tax and Non-tax Revenue among major Indian states has been dealt with in Chapter-V. Measurement of Fiscal Deficit among the Indian states and an identification of the chief concomitants of the deficit has been carried out in Chapter-VI. Measurement of tax and non-tax revenue buoyancies among the Indian states was the thematic objective of Chapter-VII. Long-run sustainability analysis among Fiscal Deficit, Public Debt and Interest Payments among the Indian states has been covered under Chapter-VIII. Next, an interrelationship between pattern of development vis-à-vis fiscal health of the Indian states has been examined in Chapter-IX. Further, convergence analysis among the major Indian states with respect to different dimensions of their fiscal health vis-à-vis their income has been carried out in Chapter-X. And, finally, Chapter-XII presents summary, conclusions & policy implications derived from the study.

Main Findings:

The main findings that have found from the study are summarized chapter-wise, as follows:

Chapter-IV: An Analysis of the Recommendations of Recent Finance Commissions of India — A Descriptive Treatise

In this chapter, an attempt has been made to perform a descriptive analysis of the recommendations of different Finance Commissions, so as to make a broad
assessment as to what better could be done to improve the rapidly deteriorating fiscal health of debt-ridden states like Punjab. In the first part of the Chapter, we have made a descriptive analysis of the criteria adopted, along with the weights assigned to these criteria, by various Finance Commissions of India for the purpose of making devolution of the pool of divisible central taxes among Indian States. And, in the second part, a brief discussion has been made on the horizontal sharing of the net proceeds of the central pool of the taxes among the states.

As per the analysis, it was observed that different criteria and the importance assigned to them during different Finance Commissions lacked consistency. Factors like population, size, states’ contribution to central taxes, and poverty have been among the main yardsticks considered by the earlier Finance Commissions, while the list has been grossly reshuffled by considering other factors, like geographical, fiscal performance, environment and gender-related issues by the recent Commissions. No doubt, population has continued to be a static criterion throughout, yet its importance has undergone a voluminous marginalisation: from 100.0 percent in FC-I to just 17.5 percent in FC-XIV. The 13th Finance Commission had considered an altogether a new yardstick, viz., fiscal capacity distance with an enormously high weightage of 47.5 percent. However, the 14th Finance Commission has incorporated a major change in the set of the yardsticks: astonishingly, the criterion of fiscal performance has been assigned no importance, while two new criteria, viz., demographic change and forest cover have been introduced by the Commission. Furthermore, no importance has been given to tax efforts, thus putting the states like Punjab at a disadvantageous position.

As per the discussion made on the horizontal sharing of the central taxes, it was noticed that the relatively poorer states like Uttar Pradesh, Bihar, Madhya Pradesh, Andhra Pradesh and Odisha have been getting all through a very heavy chunk of the resources; whereas on the contrary, the states like Gujarat, in general, and Punjab, in particular, have experienced a perceptible loss in their relative shares over a period of time. In fact, the Punjab state (which, in comparative terms has a better physical infrastructure and is contributing largely to the central pool of taxes) has been the real big loser; its relative share has not only declined rapidly during the successive Finance Commissions, but the share in absolute terms, too, is quite low (1.58 inspite
of the raising of the extent of net proceeds of the divisible tax pool from 32 to 42 percent) as at present.

Chapter-V: Growth Performance and Structural Transformations in Tax and Non-tax Revenue among Indian States

At the outset, we may mention that although the analysis on growth performance and structural transformations in tax and non-tax revenue was performed in respect of each of the 17 major states; yet, in order to save space, presentation of the results were made for the Punjab state only.

As far as Behavioural Growth Paths traced by different components of revenue are concerned, these were generally non-linear in nature and, in a large majority, the growth paths were either ordinary cubic (CUB), log-cubic (LCB) or log-parabolic (LPB). This amounts to saying that the constancy hypothesis on growth rates had to be rejected in respect of a large majority of the components of tax and non-tax revenue. As regards relative growth rates, different components have displayed differential pattern of growth. Constancy hypothesis could be validated in respect of merely three components: Taxes on Commodities and Services; State Plan Schemes; and Non-Plan Grants. A large majority of the rest of the components of revenue portrayed either a U-shaped or an inverted U-shaped growth pattern. Kinks occurred in respect of various components of revenue were mostly during post-liberalization period Further, so far as Punjab economy is concerned, Tax Revenue collection has undergone an acceleration by way of reforms measures, while Non-tax Revenue collection, on the contrary, has faced a retardation. Consequently, if the state is to improve its fiscal health, efforts need be made to tap resource generation via Non-tax activities. As far as nature of structural shifts in revenue generation is concerned, throughout the study span, Tax Revenue has continued to play big-brother’s role towards revenue generation in comparison to the role played by Non-tax Revenue. As per the quantitative measurement of the pace of structural shifts in revenue generation during different spans of time in Punjab (and, similarly, in each of the other major Indian states), a number of states (viz., Andhra Pradesh, Bihar, Gujarat, Haryana, Odisha, Punjab and Tamil Nadu) have experienced structural changes in the revenue generation at a very rapid pace. On the other extreme, the states like
West Bengal, Karnataka and Assam have undergone structural changes in revenue generation at relatively slower rates.

Chapter-VI: Measurement of Fiscal Deficit and An Identification of the Chief Concomitants thereof Among the Indian States

As regards the major findings from the chapter, there existed fairly wide differences in Fiscal Deficit (FSDF), both within and between the states, which failed to provide us with a concrete picture on relative performance of Indian states. Mean value of fiscal deficit for Haryana was the least but, then, the value was associated with a very high degree of instability. States like Bihar, Odisha, and Himachal Pradesh constituted the stratum associated with high fiscal deficit coupled with substantial instability. Further, in the light of the identified determinants of fiscal deficit, promotion of services sector, effective collection of sales tax and curtailment of non-developmental expenditure would pull down fiscal deficit among the Indian states. Stern checking of tax evasion and imposition of taxes (though at marginal rates) on large farm holdings could further help in this direction.

Chapter-VII: Measurement of Tax and Non-tax Revenue Buoyancies among Major Indian States

As per panel unit-root analysis, all the aggregates (under logarithmic transformation) were tested to be I(1), and that each of Tax Revenue (TXRV), Non-Tax Revenue (NTRV) and Total Revenue (TLRV) were cointegrated with GSDP. Thus, there was an existence of long-run equilibrium relationship between states’ revenue and their income. The findings thus provide us with a due justification to perform regression analysis of the states’ revenue upon their income. As per panel Granger’s causality analysis, there was a strong indication of the presence of bi-directional Granger’s causality between TXRV & GSDP and, similarly, between TLRV & GSDP. However, no causal linkage could be detected between NTRV & GSDP. As per the estimation of buoyancy coefficients, there existed wide variations among the estimates. For instance, in states like ANP, ASM, MDP, PNB, and UTP tax buoyancy measures have temporally increased but, on the other hand, in states like MHR, RAJ, and TND, the measures have remained virtually static. Whereas, in a large number of states like BHR, GUJ, HAR, HMP, JNK, KRL, ODS, and WSB, the buoyancy coefficients have significantly come down. On the whole, the
buoyancy coefficients in respect of each of Total Revenue, Tax Revenue and Non-Tax Revenue had a general tendency to be relatively lower during post-reforms period vis-à-vis the pre-reforms period. The findings have thus indicated towards a non-favourable impact of the measures towards revenue generation. Less than unity values of the buoyancy coefficients (during both pre- and post- reforms period) implies that an increase in income has been accompanied with a suppressed level of increase in revenue generation.

Chapter-VIII: Long-Run Sustainability Analysis among Fiscal Deficit, Public Debt and Interest Payments among the Indian States

In this chapter, an attempt has been made to examine long run sustainability, if any, among Fiscal Deficit, Public Debt and Interest Payments among the Indian states. For meeting the objectives, state-wise time series information (at both current and at constant prices) was used in respect of nine aggregates of Deficit, Debt, Expenditure, Revenue and Income. Specifically, the aggregates under consideration were: Fiscal Deficit, Public Debt, Interest Payments & Servicing of Debt, Developmental Expenditure, Non-Developmental Expenditure, Expenditure on Social Services, Expenditure on Economic Services, Aggregated Expenditure, Gross State Domestic Product and GSDP Deflator.

At the outset, relative growth rates (RGRt) were computed through the ‘best-fit’ functional form as identified out of fourteen functions fitted to each of the aggregates. Subsequently, average annual rates of growth were obtained from these RGR values for each of the aggregates. For studying debt-deficit sustainability at the sub-national level, we have resorted broadly to two distinct approaches: (a) Based upon the theoretical framework of Domar’s (1944) model; and (b) Based upon panel cointegration analysis among the time series under study.

As regards main findings on expenditure side, the major Indian states, in general, and Punjab, in particular, have been paying relatively less attention towards developmental activities in comparison to the non-developmental activities. Maharashtra, Karnataka, and Odisha were the only exceptional states wherein the two aggregates had undergone real growth at desirable rates. As per the results obtained through Domar’s approach, a large number of the Indian states (such as
(Assam, Bihar, Kerala, Karnataka, Rajasthan, Tamil Nadu, Uttar Pradesh, and West Bengal) have failed to maintain their debt-deficit fiscal sustainability. The findings are thus in line with what was hypothesised that, “There is an absence of long-run sustainability between Fiscal Deficit, Public Debt and Interest Payments among the Indian states”. Jammu & Kashmir was the only state to have fulfilled Domar’s ideal condition of sustainability. But then, the state happens to be the special category state; the condition got satisfied presumably owing to special assistance and other incentives received by the state from the Central Government. Similarly, in Himachal Pradesh – another hilly state enjoying certain tax incentives –, the rate of growth in the economy was higher than the rate of interest on Public Debt.

Through panel cointegration analysis (performed basically for studying long-run equilibrium relationship), a general finding was that the first-differenced series on the aggregates under study were stationary. Further, the five broad aggregates of Debt, Deficit, Interest, Expenditure and Income among the major Indian states were tested to have borne long-run steady-state equilibrium relationship and that there was a strong indication of bi-directional causality between Public Debt and Fiscal Deficit. Finally, application of Panel Vector Autoregression (VAR) analysis revealed that Public Debt was strongly linked with its own past values, as well as the past values of each of Fiscal Deficit (FSDF), Interest Payments & Servicing of Debt (IPSD) and GSDP Deflator (DEFT). The findings, thus, paint a gloomy picture for the Indian states in the sense that these are trapped in a vicious circle of debt, deficit, interest payments and inflationary pressure.

**Chapter-IX: Pattern of Development vis-a-vis Fiscal Health of the Indian States**

In a number of economic activities, employment intensity was observed to be more than unity; thus, in relative terms, dependence of workers in such activities has been more than what they are producing. Generally, the extent of structural disharmony (as measured through the index $\xi$) was larger in rural regions compared to the urban regions. In states like Punjab, severity of the extent of disharmony was particularly high during the second half of the study period. We may emphasise that in the present chapter, we have tried to study the nexus between fiscal deficit and the index $\xi$ of structural imbalance, with the sole objective to probe whether the index could be used as a significant determinant of fiscal deficit or not. As per the findings, there
existed a significantly strong association between fiscal deficit and ξ. The index continued to influence fiscal deficit significantly, even in conjunction with its already identified determinants. We may thus say that fiscal health of Indian states will get adversely affected through disharmonious pattern of development in the states. Consequently, if we wish to improve fiscal health of the states at sub-national level, then it becomes imperative that suitable steps (such as consolidation of rural industrialisation) be adopted so as to release disguised work force engaged in less productive agriculture sector to get absorbed in other relatively more productive manufacturing

Chapter-X: Convergence among the Major Indian States with respect to Different Dimensions of their Fiscal Health vis-à-vis their Income

The results on α- σ-convergence were broadly similar; neither of the two analyses could detect convergence in respect of Fiscal Deficit, Tax Revenue-GSDP ratio, Developmental Expenditure, Aggregated Expenditure and Per Capita Income. Both the analyses strongly pointed towards the presence of convergence in Public Debt. Such a phenomenon might be due to compulsion of every state (poor or rich) to go in for Public Debt so as to make provisions for huge resources required for their economic and social development. Further, both the analyses provided a strong indication towards divergence in Non-Tax Revenue-GSDP ratio among the Indian states (thereby implying ever-widening inter-state disparities and inequalities in the aggregate), which might possibly be due to geographical differences of the states, inequitable spread of infrastructure, inequitable public expenditure among the states, non-uniform tax policies of the states, differences in devolution of taxes from the centre as per recommendations of Finance Commissions, etc.

Implementation of Goods and Services Tax (GST) would introduce uniformity in tax rates and would hopefully assist in attaining convergence with respect to Tax Revenue- and Non-tax Revenue-GSDP ratio among the Indian states. Nevertheless, as regards speed of convergence (as gauged through β-approach), both conditional and unconditional versions provided us with a strong evidence in favour of temporal convergence among the states with respect to each of the eight macroeconomic variables considered. Speed of convergence was the fastest in respect of Fiscal Deficit, possibly due to the uniform implementation of VAT
regime by different state governments, as also due to the obligation of the 13th Finance Commission to reduce fiscal deficit (to the targeted level of 3%).

No doubt, the outcomes of the three different approaches adopted for studying convergence were not concordant. However, such a disharmony in the findings is not unusual and that this is in line with what a number of other such pieces of research have revealed. Moreover, the differential nature of the findings could be due to different rationale of the underlying methodologies of the three types of analyses.

**Concluding Remarks and Policy Implications**

In a nutshell, the ever-increasing relative share of non-developmental expenditure plus large scale subsidies and vote-catching incentives provided by the states like Punjab, coupled with insufficient user charges, have largely contributed to the deterioration in states’ fiscal health. Furthermore, the widening gap between revenues and expenditures have forced the states towards resorting to borrowing at high nominal interest rates. This has resulted in rising debt-servicing costs and, hence, to a deterioration of fiscal health of the states. In the light of the findings from the analysis, the following policy implications may be derived:

1. Since non-tax revenue has significantly helped in pulling down fiscal deficit among the Indian states; therefore, the states need to improve non-tax revenue generation effectively and efficiently;

2. In the light of the non-significance of the ‘Relative shares of Primary sector in GSDP’, there is a dire need to investigate explore sources of revenue generation from agricultural sector by imposing marginal rates of taxes on, at least, big farmers (and divert the generated resources partly to improve the plight of small and marginal farmers). In order to broaden the tax base and to bring down the scope of tax evasion (as also to ensure equity), there is an urgent need for complete merger of agricultural and non-agricultural incomes;

3. Since non-developmental expenditure was seen to be significantly pushing up the fiscal deficit; therefore, vote-catching measures and other subsidies like distribution of free electricity and water across the board needs be done away with, particularly in states like Punjab;
4. Keeping in view rapidly growing non-developmental expenditure, particularly in cash-strapped states like Punjab, there has to be a will on the part of the state governments to enforce fiscal tightening and austerity measures via curtailments in wasteful expenditure on non-developmental activities (like large-scale appointments of Chair Persons of Boards and Chief Parliamentary Secretaries; purchase of *hi-fi* modes of transportation, such as luxury cars, helicopters for Ministers; raising of statutes of political leaders, *etc.* with public money);

5. Keeping in view the identified determinants of fiscal deficit, states need to make the public administration efficient and clean, so as to sternly check tax evasion in the industrial sector and ensure accountability in construction activities;

6. Since the determinants like ‘Relative Share of Tertiary-1 Sector in GSDP’, and ‘Sales Tax’ were found to be assisting in pulling down fiscal deficit; therefore, efforts also need be made not only to promote trading activities but also ensure collection of sales tax effectively;

7. Similarly, ‘Relative Share of Tertiary2 Sector in GSDP’ was also found to be highly significantly pulling down fiscal deficit among the Indian states; therefore, promotion of banking activities and other services (like that of teaching and research) with higher accountability need be given priorities. Budgetary allocations need be enhanced towards social sector activities;

8. Although, debt-deficit sustainability was observed at the pooled level, yet the same was found to be absent in respect of a large number of individual Indian states. Therefore, if the states’ economies are to be protected from some sort of collapse, strenuous efforts need be made to improve their fiscal health (so as to bring down their fiscal deficit), so that debt-deficit sustainability could be realised.

9. As there existed a high degree of instability in fiscal deficit among a majority of the Indian states; therefore, the states need to adopt consistency and continuity in their policies so as to bring down the severity of instability in their fiscal deficit;

10. There is a dire need for final passing (through upper house of the Parliament as well, although it has already been through only recently from the lower house) of the GST Bill, its enactment as a law, and then for its proper implementation, which might help towards ensuring convergence among the states in respect of revenue generation;
11. A high degree of structural imbalance was noticed, particularly in rural regions among the Indian states, which lead to a deterioration in fiscal health. Therefore, for improving the structural imbalance and, hence, to bring down fiscal deficit, the states need to adopt suitable steps (say through consolidation of rural industrialisation) to release disguised labour force engaged in agriculture sector to get absorbed in other relatively more productive activities;

12. Further, promotion of non-farm activities (like, bee keeping, dairy, poultry, piggeries, etc.) and skill formation activities may also help in this particular direction;

13. In the light of a strong interlinkage detected between fiscal deficit and public debt, and that public debt, among other concomitants, was found to be responsible for pushing up fiscal deficit; therefore, there is need on the part of the state governments to reduce their Public Debt burden after managing the Fiscal Deficit at the minimum acceptable (3 percent) level as recommended by 13th Finance Commission;

14. It might have been better if the 14th Finance Commission did not altogether ignore important yardsticks, like tax effort and fiscal capacity distance of the states, while making recommendations for the devolution of divisible resources;

15. Finally, some relief could have been provided by the Commission to the agrarian states like Punjab and Haryana, which have been playing a very important role for ensuring food security, by way of assigning suitable weights to their relative contribution towards national basket of foodgrains.

**Limitations of the Present Study:**

Although the present study is an elaborated attempt to evaluate fiscal health of the major Indian states, yet we observed a set of glaring limitations associated, particularly with the requisite database. Some such limitations were: (a) Widely fluctuating behaviour of Fiscal Deficit estimated from the available data which led to high instability in the measure in a majority of the states; (b) Non-availability of data on a number of tax/non-tax revenue variables for majority states, thereby forcing us to confine to a curtailed set of the variables and time period; (c) There exists a serious limitation and inaccuracy associated with the computation of fiscal deficit: due to lack of transparency, loan-waivers are not accounted for while
computing fiscal deficit; and (d) Lack of transparency in respect of the methodology adopted by various Finance Commissions in allocating share to states from the central pool.

The quality of work would presumably have been better, if we were free from such limitations. The idea of highlighting these limitations is also to make concerted efforts to ensure improvement in the database in respect of fiscal parameters of the Indian states.

**Avenues for Future Research:**

Various aspects of the analysis as performed in the present investigation could also be executed on similar lines in respect of group of nations, such as *South Asian Association for Regional Co-operation (SAARC)* countries; *Brazil, Russia, India, China and South Africa (BRICS)* nations; among *Developing Economies*; and, similarly, among different districts of India (subject to the availability of data, of course). Furthermore, an indepth analysis could also be performed to study interlinkages between physical and social infrastructure of the Indian states, *vis-à-vis* their fiscal health.