
# Does the Imbalance in Growth-Job Pattern Influence Fiscal Health? Experience of the Major Indian States

Amarjit Singh Sethi and Harminder Singh Teja (Punjab School of Economics, Guru Nanak Dev University)

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# Does the Imbalance in Growth-Job Pattern Influence Fiscal Health?
## Experience of the Major Indian States

**Amarjit Singh Sethi[1] and Harminder Singh Teja[2]**

**[1]Professor, [2]Senior Research Fellow, Punjab School of Economics, Guru Nanak Dev University, Amritsar (India) – 143 005 (E-mail: ajss.gndu@gmail.com).**

## Abstract

Based on the data compiled from the unit-level information in respect of 50th, 55th, 61st and 68th Rounds of NSSO on absolute workforce engaged in eight major economic activities (separately for rural and urban regions) among 17 major Indian states, this paper aims at (i) estimating employment elasticities in different economic activities (so as to get a broad picture on the differentials in workforce intensities among the states); (ii) constructing a quantitative measure of structural imbalance in each of the states; and (iii) studying nexus, if any, between the measure of structural imbalance and fiscal deficit among the states. Using the composition of different economic activities in employment and income, values of the index $\xi$ of structural imbalance (due to Sethi and Raikhy, 2001; Sethi, 2003) were computed at different points in time, separately for rural and urban regions, as also for the overall economy. The analysis has revealed that the extent of disharmony was, in general, larger in rural regions *vis-à-vis* the urban regions. Through step-down multiple linear regression analysis (with both fixed and random effects modelling under panel data frame-work), an attempt was then made to study the nexus between fiscal deficit and the index $\xi$, so as to probe whether the index could be used as a significant determinant of fiscal deficit or not. As per the findings, the measure $\xi$ happened to be a significant determinant (along with certain other pre-identified concomitants) of fiscal deficit. Thus, besides other things, fiscal health of the Indian states would get adversely affected by way of disharmonious pattern of development in the states. Suitable policy implications have been drawn from the paper accordingly.

**Key Words:** Employment Intensity, Fiscal Deficit, Structural Imbalance, Two-way ANOVA, Panel Data Estimation, Fixed and Random Effects Modelling, Hausman's Test, R-language.

**JEL Classification:** $C_{18}$, $C_{23}$, $E_{23}$, $E_{62}$, $H_{51}$, $H_{62}$, $J_{21}$, $R_{11}$.

## 1. Introduction

Income and Employment has always been crucial for economists, sociologists and politicians. Right since imperialism, performance of the states has continued to be adjudged on the basis of the economic growth and employment status of their subjects. Economic prosperity of a region is perceived to be at its desirable level when a large majority of its subjects are optimally and gainfully employed. Employment provides income to a person, which is used to create effective demand for consumption and capital goods in the region. This effective demand, in turn, leads to increased production of goods and services. This increased production again leads to more employment opportunities, thereby leading to the creation of an

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important, not only for economic growth but its ramifications have also been on social and political stability and peace in the region (Kiran *et al.,* 2014*).*

It is generally believed that economic development and structural changes move hand-in-hand (Yotopoulos and Nugent, 1975; Todaro, 2002; Thirlwall, 2006). If faced with distortionary policies, an economy might witness temporal changes (in the composition of different sectors and sub-sectors in output and employment) which could lead to imbalanced growth (Sethi, 2003). A knowledge on such changes, duly coupled with an information on the intensity of employment in different economic activities, could thus assist us in framing suitable growth-promoting policies.

As per a number of empirical studies conducted in the past, Indian states are infested with ever-rising inequalities in different economic dimensions. As goes fiscal health of a state, the same is expected to have some bearing, among other forces, with the pattern of development (as gauged through the structure of employment relative to that of output). With these points in mind, an attempt has been made in the present paper to (a) estimate intensity of employment in different sectors of each of the major Indian states; (b) to measure the extent of imbalance in the pattern of development in each of the states; and (c) to examine the linkage, if any, between the measure of imbalance and fiscal health of the states. However, before proceeding further, we have made a brief review of some of the studies related with the aspect of under consideration, as follows.

## 2. Brief Review of the Related Literature

Sethi and Raikhy (1998) advocated for devising strategies for employment shifts from agriculture to industry and service sectors, so that structural changes in output and employment become favourable; and rate of growth at the state and hence at the country level gets raised. Sethi and Raikhy (2002) opined that while growth is important for reduction in poverty of an economy; yet, structure of the economy, relative income distribution, literacy, urbanisation, employment rate and inflation rate, too, are important to pull down the extent of poverty. They further suggested that for a permanent solution over a long period of time, measures need be adopted to reduce disparities and structural imbalance in the economy. Relative share of

service sector in labour force continues to be significant; consequently, policy formulation for alleviation of poverty must keep the factor in mind. Sethi (2003) examined the nature of structural changes in output and employment along with inter-sectoral linkages in income of Haryana state. His analysis revealed the presence of strong inter-linkages of income from each of primary and tertiary sectors with the aggregated income. However, secondary sector failed to exhibit perceptible forward and backward linkages with income from other sectors. Agro-processing industrialisation, especially in rural pockets, may act not only as a booster for the secondary sector but also could help in curbing the severity of structural distortions in the state's economy. Krishna (2004) made an account of the patterns and determinants of growth in Indian states during the period 1960-2000, covering 14 major Indian states. As per his findings, growth in the states during the study period was characterized by instability and volatility. The degree of volatility was very high in states like Odisha and Bihar, while the pace of economic growth was relatively slower in states like West Bengal, Kerala, Tamil Nadu and Karnataka. In order to examine the level of development, separately for agricultural, infrastructural and overall socio-economic sectors, Narain *et al*. (2007) carried out an analysis of seventeen major and ten smaller states of India. As per the analysis, wide disparities were observed to be present in the level of development among different states. The state of Punjab was ranked the first, while Bihar was ranked the last in the overall socio-economic development. Infrastructural facilities and literacy status were observed to be influencing socio-economic development positively which, in turn, was directly associated with the development in agricultural sector. In their study, Pattanaik and Nayak (2013) identified labour productivity, GDP growth, share of services to GDP, investment and foreign trade as the macroeconomic factors determining employment intensity of secondary sector in India. The authors argued that there has been a destruction of productive jobs in organised manufacturing as the informal employment is on the rise. Sethi and Kaur (2013a) opined that high capital intensity, coupled with low productivity of labour, particularly in the Punjab state, is indeed a cause of concern. Therefore, attention needs be paid towards efficient use of capital, as also to use capital judicially along with labour. A balance needs be struck between the contributions of employment growth and labour productivity growth, so as to ensure a boost in the pace of economic growth. Sethi

and Kaur (2013b) further opined that in labour surplus economies like India, emphasis on raising labour productivity (through adoption of labour-saving technology) at the cost of employment would result in a significant increase in poverty and inequality in the distribution of income. What is ideally required is to boost both employment growth and labour productivity growth in a balanced manner so as to attain economic growth at a faster pace. According to Kiran *et al.* (2014), there are growing income disparities among different income groups in India and, consequently, the concentration of economic power is growing in the country which, of course, is a challenge for equitable growth.

As per the studies reviewed above, growth and structural pattern of employment *vis-à-vis* those of output have a close bearing with a number of macro-economic conditions like poverty, disparities and productivity. However, the studies on the influence of the extent of structural imbalance and fiscal deficit among the Indian states appear to be unavailable. Therefore, an attempt has been made in this paper to make a measurement of structural imbalance in main economic activities for both and rural and urban regions in respect of major Indian states, and then to study the association, if any, between the extent of imbalance and fiscal deficit among the states. The findings from the paper are thus expected to make an addition to the existing knowledge.

## 3. Data

For the purpose of estimation of the measure of structural imbalance, Unit-level National Sample Surveys Organisation (NSSO) data on work force (in absolute numbers) as engaged in *eight* major economic activities, separately for rural and urban regions, among the 17 major Indian states was procured/ compiled. The data were procured for *four* different rounds, *viz.*, for 50$^{th}$ Round (1993-94); 55$^{th}$ Round (1999-00); 61$^{st}$ Round (2004-05); and 68$^{th}$ Round (2011-12). The economic activities in respect of which the information on working force was compiled, were: Agriculture, Forestry and Fishing (AGFF); Mining, Quarrying and Manufacturing (MNFG); Construction (CONS); Electricity, Gas and Water Supply (EGWS); Transport, Storage and Communication (TSCM); Trade, Hotels and Restaurants (THRS); Financing, Banking, Insurance, Real Estate, Ownership of Dwellings and

Business Services (FBRD); General Services, Public Administration and Other Services (GNSR); and Aggregate of All Activities (AGGD). Compilation was also made on GSDP (at current as well as at 2004-05 constant prices) of each of the 17 states in respect of these economic activities.

For the purpose of making an assessment of fiscal health (through the composite measure *viz., fiscal deficit*) of a state at a given point in time, secondary data were compiled (at current prices) in the form of regular time-series for the study period of 19 years (from 1993-94 to 2011-2012) on six fiscal aggregates [*viz*., Total Revenue Expenditure (TREX), Total Capital Outlay (TCPO), Loans and Advances from State Governments (LASG), Recovery of Loans (RCLN), Total Revenue (TRVN), and Non-Debt Capital Receipts (NDCR)] and Gross State Domestic Product [GSDP, at both aggregated and disaggregated levels: Primary, Secondary, Tertiary1, Tertiary2, and Tertiary; at factor cost and at current prices] for each of the states. Further, in the light of the findings from Sethi and Teja (2014), the requisite panel information for the present paper was compiled also on: Revenue Receipts of Sales Tax (SLTX); Revenue Receipts of Non-Tax Revenue (NTRV); Revenue Receipts of States' Own Tax Revenue (SOTR); Revenue Receipts of Share in Central Taxes (SICT); Revenue Expenditure of Economic Services (EXES); Revenue Expenditure of Social Services (EXSS); Revenue Expenditure of Interest Payments & Servicing of Debt (IPSD); Revenue Expenditure of Non-Developmental Expenditure (NDEX); GSDP of Primary sector (RSPR); GSDP of Secondary sector (RSSC); and Relative Share of Tertiary-1 sector in GSDP (RST1). Compilation of the data was made primarily from Reserve Bank of India Bulletin (various issues), different reports of Planning Commission of India, Statistical Abstracts of India and States. Various issues of National Accounts Statistics of the Central Statistical Organisation, Centre for Monitoring Indian Economy, and National Human Development Reports were also used for compilation of the data.

The states considered were: 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).

On each of the economic activities, we had thus available with us, panel data (on work force, income and other aggregates) with 17 crossections (major states) and 19 years (1993-94 to 2011-12).

## 4. Analytical Techniques

The following analytical tools and techniques were adopted in the paper:

**4.1.** At the outset, inter-rounds interpolations of working force ($W_t$) were made through the usual compound growth rate law. Let us say, for a given component in a given state, $W_0$ and $W_f$ be the workforce estimates for the base (say, $55^{th}$) and the final (say, $61^{st}$) rounds, separated by n (= 6) years. Then the interpolated workforce for the $t^{th}$ year beyond the base round was obtained as

$$W_t = W_0(1+r)^t \quad \cdots (1)$$

where $r = \left(W_f/W_0\right)^{1/n} - 1$.

**4.2.** Employment intensities of growth were quantitatively estimated by regressing (in the panel data frame-work) employment in each of the economic activity upon output from the activity, through the logarithmically transformed version of geometric relationship, expressed as

$$\ln(E_i) = \beta_0 + \beta_1 \ln(Y_i) + u_i \quad \cdots (2)$$

wherein 'ln' stands for natural logarithm, $E_i$, $Y_i$, and $u_i$ stand respectively for employment, output and disturbance term associated with the $i^{th}$ economic activity. The regression coefficient ($\beta_1$) is nothing but the 'employment elasticity', which measures the 'employment intensity of economic growth', and provides a meaningful information about labour market and the region's overall macro-economic performance (Pattanaik and Nayak, 2013).

**4.3.** Primarily, the above part of the analysis was carried out to probe the relative productivity performance of employment in different economic activities at the national/ sub-national levels. For this purpose, panel data estimation was carried out through the methodology briefly outlined, as follows:

Standard specification of the model for balanced panel data estimation (Baltagi, 2001; Croissant and Millo, 2008) could be written as

$$Y_{it} = \alpha + \beta^T X_{it} + u_i + \varepsilon_{it} \quad \cdots (3)$$

where i = 1, 2, …, k refers to cross section units (or state index); t = 1, 2, …, n is the number of time series units (or time index); $Y_{it}$ is the dependent variable; $X_{it}$ is the k-dimensional row vector of explanatory variables, excluding the constant. The model involves two additive error components, *viz*., $u_i$ (which is specific to a particular state and does not change over time) and $\varepsilon_{it}$ (the idiosyncratic error, usually assumed to be well-behaved and independent from both the regressors, $X_{it}$ and individual error component $u_i$).

The appropriate estimation method for this model depends upon the properties of two error components. The individual component could, in turn, be either independent from the regressors or correlated. If it was correlated, the OLS estimator for $\beta$ would be inconsistent. It would, therefore, be customary to treat $u_i$ as a further set of n parameters to be estimated, thus providing $\alpha_i = \alpha + u_i$ for all t. This would be *fixed* (or *within*) *effects model*, usually estimated by OLS technique on the transformed data, and is known to provide consistent estimators for $\beta$.

However, if the state specific component $u_i$ happened to be uncorrelated with the regressors, we were led to *random effects model*. In such a model, the overall error terms would be random and, therefore, the OLS estimator is known to be consistent. Within random effects model, estimations were carried out through *four* alternative versions: *swar* (due to Swamy and Arora, 1972); *walhus* (due to Wallace and Hussain, 1969); *amemiya* (due to Amemiya, 1971); and *nerlove* (due to Nerlove, 1971).

Judicious choice between fixed effects (FE) and random effects (RE) specifications was made through Hausman (1978) test, which is designed to detect the violation of random effects modeling assumption that explanatory variables are orthogonal to unit effects. For this purpose, we computed the test statistic H, given by

$$H = \left(\hat{\beta}_{RE} - \hat{\beta}_{FE}\right)' \left[\mathrm{Var}\left(\hat{\beta}_{FE}\right) - \mathrm{Var}\left(\hat{\beta}_{RE}\right)\right]^{-1} \left(\hat{\beta}_{RE} - \hat{\beta}_{FE}\right) \quad \cdots (4)$$

where $\hat{\beta}_{RE}$ and $\hat{\beta}_{FE}$ are the vector of *random effects* and *fixed effects* estimates. Under the null hypothesis of *orthogonality*, H-statistic is known to follows $\chi^2$-distribution with degrees of freedom equaling the number of regressors in the model. Conceptually, the test compares the two estimators under the null hypothesis of no significant difference between them. And the alternative suggests that both estimators are dissimilar.

A value of $p < 0.05$ was taken to provide the evidence that, at conventional levels of significance, the two models were different enough to reject the null hypothesis, and hence to reject the random effects model in favour of the fixed effects model. However, if $H_0$ could not be rejected, the more efficient random effects estimator was chosen (Croissant and Millo, 2008). Within random effects modelling, optimum choice of the transformation was made through Akaike's Information Criterion (AIC).

**4.4.** For each of the 19 years, fiscal deficit (FD, as a percentage of the GSDP) of each of the 17 states was computed by following the methodology as adopted by National Institute of Public Finance and Policy (as also mentioned in Dholakia and Karan, 2005; Sethi and Teja, 2014), *viz.*

$$\text{FD (\%)} = \frac{[(\text{TREX} + \text{TCPO} + \text{LASG}) - (\text{TRVN} + \text{RCLN} + \text{NDCR})]}{\text{GSDP}} \times 100 \quad \ldots (5)$$

**4.5.** For estimating the extent of imbalanced growth, the measure $\xi$, as proposed by Sethi and Raikhy (2002), and Sethi (2003) was constructed, by following their methodology as reproduced below:

Let $p_1, p_2, \ldots, p_k$ be the relative shares of 'k' distinct sectors in GSDP of a state, and let $q_1, q_2, \ldots, q_k$ be such shares of the sectors in work-force of the state. Further, let $r_i = p_i / q_i$ and $s_i = r_i / \sum_{i=1}^{k} r_i$; $i = 1, 2, \ldots, k$. Now, if we compute *entropy measure* between the k values of $s_i$ as

$$E = -\sum_{i=1}^{k} s_i \ln s_i \qquad \cdots (6)$$

then, as per the authors, the quantity $\frac{1}{k}e^{E} = 1$ for a state which is associated with a harmonious structure with respect to both income and employment. Consequently, they proposed an index $\xi$ of *Structural Imbalance* as

$$\xi = \left(1 - \frac{1}{k}e^{E}\right) \times 100 \qquad \cdots (7)$$

According to the authors, value of the index $\xi$ would be close to *zero* for a state having a similar structure with respect to both income and employment, but will be perceptibly away from zero (in the positive direction) for a state having dissimilar structures.

For each of the Indian states, the index $\xi$ was computed, separately for rural and urban regions, as also for the overall state. *Two-way analysis of variance* was performed to see if there existed significant differences in the severity of structural imbalance among the states, as also among the years.

**4.6.** Finally, in order to examine as to whether the index $\xi$ could act as a meaningful determinant of fiscal deficit in isolation as also in conjunction with the already identified important concomitants of fiscal deficit (Sethi and Teja, 2014), panel data-based step-down multiple linear regression analysis (duly coupled with Hausman's test) was carried out.

## 5. Results and Discussion

Although the information on the absolute number of workers engaged in eight different economic activities were compiled (in respect of four rounds of the National Sample Surveys Organisation) for all the 17 major Indian states, yet for the purpose of saving space, the information has been presented here (Table 5.1) in respect of the Punjab state only. For instance, as per $50^{th}$ round (pertaining to the year 1993-94). the total number of workers in the state were 1877120, out of which as many as 914758 workers were engaged in Agriculture, Forestry and Fishing; 222650 in Manufacturing and Mining & Quarrying; 93735 in Constructions; 35017 in Electricity, Gas & Water Supply; 94814 in Transport,

**Table 5.1. Workforce Estimates (in Lakhs) for Major Economic Activities in Punjab**

| Round | Economic Activity | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **AGFF** | **MNFG** | **CONS** | **EGWS** | **TSCM** | **THRS** | **FBRD** | **GNSR** | **AGGD** |
| **50th (1993-94)** | **Rural** | | | | | | | | |
| | 8.545 | 0.748 | 0.589 | 0.229 | 0.540 | 0.919 | 0.101 | 1.072 | 12.743 |
| | **Urban** | | | | | | | | |
| | 0.602 | 1.479 | 0.348 | 0.121 | 0.408 | 1.616 | 0.193 | 1.261 | 6.028 |
| | **Total** | | | | | | | | |
| | 9.148 | 2.227 | 0.937 | 0.351 | 0.948 | 2.535 | 0.293 | 2.333 | 18.771 |
| **55th (1999-00)** | **Rural** | | | | | | | | |
| | 6.631 | 0.711 | 0.713 | 0.117 | 0.474 | 0.529 | 0.066 | 1.730 | 10.971 |
| | **Urban** | | | | | | | | |
| | 0.326 | 1.748 | 0.583 | 0.098 | 0.431 | 1.424 | 0.221 | 1.589 | 6.418 |
| | **Total** | | | | | | | | |
| | 6.957 | 2.459 | 1.296 | 0.215 | 0.904 | 1.952 | 0.287 | 3.320 | 17.389 |
| **61st (2004-05)** | **Rural** | | | | | | | | |
| | 15.437 | 2.303 | 4.063 | 0.265 | 1.909 | 2.602 | 0.194 | 4.163 | 30.936 |
| | **Urban** | | | | | | | | |
| | **0.683** | **4.211** | **1.377** | **0.509** | **1.549** | **4.482** | **0.700** | **3.567** | **17.077** |
| | **Total** | | | | | | | | |
| | 16.119 | 6.514 | 5.441 | 0.775 | 3.458 | 7.084 | 0.894 | 7.730 | 48.014 |
| **68th (2011-12)** | **Rural** | | | | | | | | |
| | 13.156 | 3.538 | 7.178 | 0.490 | 1.546 | 2.868 | 0.384 | 5.001 | 34.161 |
| | **Urban** | | | | | | | | |
| | 0.921 | 5.74 | 2.009 | 0.482 | 2.241 | 5.461 | 1.077 | 4.740 | 22.671 |
| | **Total** | | | | | | | | |
| | 14.077 | 9.277 | 9.186 | 0.972 | 3.787 | 8.329 | 1.462 | 9.741 | 56.831 |

**Source: Unit-Level Records of Consumption Expenditure Surveys, NSSO (Different Rounds);**

**Such estimates for each of the remaining 16 major Indian states were compiled/ analysed similarly.**

Storage & Insurance & Real Estate Activities; and 233282 in General Services &Public Administration. The corresponding figures for the state in respect of the latest (*i.e.*, 68$^{th}$) round pertaining to the year 2011-12 were 5683112; 1407703; 927714; 918629; 97222; 378740; 832870; 146174; and 974060 (Table 5.1). From these figures, the inter-rounds estimates for workforce were obtained (Table 5.2) through the formulation as given in equation (1) above. We may mention that though not very appealing, yet this type of generation of regular time series on workforce was absolutely necessary for carrying out the requisite analysis in the paper.

Further, as another essential ingredient for the analysis, regular time series on GSDP (in nominal as well as in real terms) in respect of the eight economic activities for each of the 17 major states was also compiled. Such information for the Punjab state has been presented in Table 5.3 (at current prices) and Table 5.4 (at 2004-05

**Table 5.2. Interpolated Values of Total Workforce (in Lakhs) Engaged in Major Economic Activities in Punjab**

| Year | Economic Activity | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | AGFF | MNFG | CONS | EGWS | TSCM | THRS | FBRD | GNSR | AGGD |
| 1993 | 9.148 | 2.227 | 0.937 | 0.351 | 0.948 | 2.535 | 0.293 | 2.333 | 18.771 |
| 1994 | 8.741 | 2.261 | 0.989 | 0.323 | 0.941 | 2.427 | 0.292 | 2.261 | 18.234 |
| 1995 | 8.350 | 2.298 | 1.044 | 0.298 | 0.933 | 2.324 | 0.291 | 2.214 | 17.752 |
| 1996 | 7.977 | 2.336 | 1.102 | 0.274 | 0.926 | 2.225 | 0.291 | 2.215 | 17.346 |
| 1997 | 7.622 | 2.376 | 1.163 | 0.253 | 0.918 | 2.130 | 0.289 | 2.313 | 17.064 |
| 1998 | 7.282 | 2.417 | 1.228 | 0.233 | 0.911 | 2.039 | 0.288 | 2.609 | 17.0071 |
| 1999 | 6.957 | 2.459 | 1.296 | 0.215 | 0.904 | 1.952 | 0.287 | 3.321 | 17.389 |
| 2000 | 8.231 | 2.985 | 1.727 | 0.278 | 1.182 | 2.526 | 0.360 | 3.923 | 21.211 |
| 2001 | 9.736 | 3.624 | 2.301 | 0.359 | 1.546 | 3.269 | 0.452 | 4.641 | 25.926 |
| 2002 | 11.518 | 4.402 | 3.065 | 0.464 | 2.022 | 4.230 | 0.567 | 5.495 | 31.762 |
| 2003 | 13.626 | 5.351 | 4.083 | 0.599 | 2.644 | 5.474 | 0.712 | 6.514 | 39.003 |
| 200 | 16.11 | 6.514 | 5.44 | 0.775 | 3.45 | 7.08 | 0.89 | 7.73 | 48.014 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **4** | 9 | | 1 | | 8 | 4 | 4 | 0 | |
| **2005** | 15.810 | 6.815 | 5.862 | 0.802 | 3.504 | 7.249 | 0.959 | 7.977 | 48.977 |
| **2006** | 15.507 | 7.174 | 6.318 | 0.827 | 3.549 | 7.419 | 1.029 | 8.237 | 50.061 |
| **2007** | 15.210 | 7.553 | 6.809 | 0.854 | 3.596 | 7.593 | 1.104 | 8.509 | 51.227 |
| **2008** | 14.919 | 7.951 | 7.339 | 0.882 | 3.643 | 7.771 | 1.184 | 8.795 | 52.482 |
| **2009** | 14.633 | 8.371 | 7.909 | 0.911 | 3.690 | 7.952 | 1.270 | 9.095 | 53.831 |
| **2010** | 14.352 | 8.812 | 8.524 | 0.941 | 3.739 | 8.138 | 1.363 | 9.411 | 55.278 |
| **2011** | 14.077 | 9.277 | 9.186 | 0.972 | 3.787 | 8.329 | 1.462 | 9.741 | 56.831 |

**Source: Own calculations from Table 5.1. Separate interpolations for rural and urban workforce were made similarly.**
**Such computations for each of the remaining 16 major Indian states were made/ analysed similarly.**

## Table 5.3. Gross State Domestic Product (at Current Prices) through Various Economic Activities in Punjab (in Rs. Lakhs)

| Year | Economic Activity | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **AGFF** | **MNFG** | **CONS** | **EGWS** | **TSCM** | **THRS** | **FBRD** | **GNSR** | **AGGD** |
| **1993** | 1395074 | 454935 | 126752 | 77042 | 100287 | 365762 | 246944 | 258018 | 3024814 |
| **1994** | 1539710 | 529391 | 140458 | 102816 | 118825 | 412825 | 291314 | 286423 | 3421762 |
| **1995** | 1664665 | 608946 | 185740 | 136743 | 149861 | 446788 | 335283 | 333460 | 3861486 |
| **1996** | 1946619 | 673759 | 188408 | 140473 | 173865 | 501964 | 397486 | 397194 | 4419768 |
| **1997** | 2048655 | 733374 | 259492 | 140161 | 208287 | 552389 | 441534 | 486527 | 4870419 |
| **1998** | 2246688 | 839747 | 328994 | 220092 | 254432 | 604021 | 440542 | 639053 | 5573569 |
| **1999** | 2520771 | 1003550 | 293846 | 231173 | 315837 | 817678 | 612537 | 920805 | 6716197 |
| **2000** | 2681236 | 1078478 | 363277 | 275444 | 358881 | 1074309 | 653060 | 983060 | 7467745 |
| **2001** | 2784289 | 1043449 | 397909 | 370749 | 428818 | 1185990 | 717699 | 1032167 | 7961070 |
| **2002** | 2708343 | 1144108 | 369934 | 324747 | 470184 | 1292993 | 801030 | 1113581 | 8224920 |
| **2003** | 2952284 | 1226494 | 452952 | 393364 | 574492 | 1361017 | 863539 | 1184718 | 9008860 |
| **2004** | 3161248 | 1468204 | 632587 | 297123 | 615745 | 1187939 | 987444 | 1333560 | 9683850 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **2005** | 3449784 | 1626545 | 771329 | 386516 | 681737 | 1338405 | 1076508 | 1518103 | 10848927 |
| **2006** | 3960364 | 2145647 | 988980 | 236052 | 777386 | 1597458 | 1254660 | 1713921 | 12674468 |
| **2007** | 4783262 | 2689714 | 1161561 | 310534 | 884625 | 1920728 | 1451101 | 1973468 | 15174993 |
| **2008** | 5553885 | 2951808 | 1293976 | 356200 | 984858 | 2076524 | 1709581 | 2315232 | 17242064 |
| **2009** | 5970086 | 3527946 | 1480567 | 389540 | 1153315 | 2354363 | 1972702 | 2663148 | 19511667 |
| **2010** | 6681383 | 4003222 | 1671708 | 436402 | 1309491 | 2607222 | 2294672 | 3129111 | 22133211 |
| **2011** | 7700732 | 4515837 | 1761875 | 466962 | 1379014 | 3042986 | 2832263 | 4100973 | 25800642 |

**Source: Aggregations made with the help of the information compiled through the official website of MOSPI;**

**Such aggregations in respect of each of the remaining 16 major Indian states were made/ analysed similarly.**

## Table 5.4. Gross State Domestic Product (at 2004-05 Constant Prices) through Various Economic Activities in Punjab (in Rs. Lakhs)

| Year | Economic Activity | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **AGFF** | **MNFG** | **CONS** | **EGWS** | **TSCM** | **THRS** | **FBRD** | **GNSR** | **AGGD** |
| **1993** | 2456979 | 999407 | 256601 | 193200 | 169593 | 714424 | 592930 | 936111 | 6319245 |
| **1994** | 2502046 | 1062049 | 259543 | 202230 | 183622 | 725958 | 617700 | 953727 | 6506875 |
| **1995** | 2508578 | 1146607 | 313635 | 208953 | 212932 | 768849 | 657614 | 977678 | 6794846 |
| **1996** | 2674089 | 1215766 | 286903 | 224714 | 243302 | 826187 | 744030 | 1023303 | 7238294 |
| **1997** | 2570773 | 1271428 | 392477 | 235585 | 268696 | 874301 | 790223 | 1098364 | 7501847 |
| **1998** | 2640456 | 1349726 | 482121 | 260061 | 309503 | 908326 | 782397 | 1185589 | 7918179 |
| **1999** | 2858043 | 1459049 | 407356 | 260613 | 359982 | 939425 | 858090 | 1237645 | 8380203 |
| **2000** | 2900382 | 1515515 | 473325 | 260703 | 399663 | 1005306 | 887186 | 1261667 | 8703747 |
| **2001** | 2920334 | 1438509 | 501485 | 260866 | 455414 | 1040174 | 917351 | 1296495 | 8830628 |
| **2002** | 2885986 | 1528061 | 470055 | 272523 | 504945 | 1074104 | 972509 | 1367223 | 9075406 |
| **2003** | 3047710 | 1585759 | 548156 | 290920 | 606386 | 1131549 | 979559 | 1399909 | 9589948 |
| **2004** | 3161248 | 1468204 | 632587 | 297123 | 615745 | 1187939 | 987444 | 1333560 | 9683850 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **2005** | 3191425 | 1577929 | 728109 | 320800 | 676445 | 1237698 | 1086189 | 1400551 | 10219150 |
| **2006** | 3282416 | 1956355 | 876220 | 350943 | 741021 | 1304575 | 1246332 | 1495510 | 11253370 |
| **2007** | 3408098 | 2330752 | 955001 | 403950 | 812216 | 1374175 | 1361851 | 1605458 | 12251500 |
| **2008** | 3477186 | 2491621 | 1028466 | 413573 | 874052 | 1495469 | 1487580 | 1775129 | 13043076 |
| **2009** | 3466610 | 2790695 | 1072047 | 415886 | 939110 | 1555213 | 1644156 | 1979930 | 13863647 |
| **2010** | 3523584 | 3044131 | 1082833 | 420192 | 979875 | 1691901 | 1851095 | 2173401 | 14767012 |
| **2011** | 3598974 | 3150231 | 1111067 | 427377 | 1069199 | 1860076 | 2058235 | 2365909 | 15641068 |

**Source: Aggregations made with the help of the information compiled through the official website of MOSPI;**
**Such aggregations in respect of each of the remaining 16 major Indian states were made/ analysed similarly.**

constant prices). Using these data, we have, at the outset, estimated employment intensities in each of the major economic activities at the sub-national level, as discussed in brief in the following sub-section.

### 5.1. Employment Intensity Measures among Indian States

Computations of employment intensity of economic growth or, equivalently, employment elasticities in different economic activities among the major Indian states, as also for pooled over all the states, were made through the formulation as given in equation (2) above. These computations have been presented in Table 5.1.1. As per the table, employment intensity in a large majority of the economic activities, at the sub-national level as well as at the aggregated level, was more than unity. This might be taken to imply that, in relative terms, dependence of workers in such activities has been more than what they were producing. Such a pattern is indicative of low productivity in a large chunk of the activities. Notably, however, the intensity was negative in respect of (a) Electricity, Gas & Water Supply in Bihar; and (b) Agriculture, Forestry & Fishing in Kerala. This implies that workforce in these

**Table 5.1.1. Computed Values of Elasticities of Employment in Different Economic Activities among Major Indian States**

| **State** | **Economic Activity** | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | **AGFF** | **MNFG** | **CONS** | **EGWS** | **TSCM** | **THRS** | **FBRD** | **GNSR** | **AGGD** |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **ANP** | 1.32*** (8.212) | 1.15*** (8.509) | 1.25*** (17.830) | 1.30*** (11.200) | 1.12*** (15.276) | 1.40*** (9.822) | 1.52*** (18.495) | 1.94*** (19.272) | 1.21*** (11.570) |
| **ASM** | 3.54*** (3.046) | 4.28*** (8.610) | 2.5613*** (7.491) | 0.41$^{NS}$ (0.927) | 1.23*** (2.266) | 1.72*** (14.441) | 1.63*** (31.900) | 1.23*** (11.504) | 2.099*** (8.426) |
| **BHR** | 1.31*** (5.345) | 0.64*** (4.049) | 0.88*** (21.060) | -0.11$^{NS}$ (-0.850) | 1.17*** (9.547) | 1.19*** (15.663) | 1.19*** (14.293) | 2.16*** (12.246) | 1.06*** (10.324) |
| **GUJ** | 1.29*** (5.396) | 1.30*** (9.376) | 0.82*** (12.542) | 2.12*** (13.007) | 0.96*** (12.449) | 1.17*** (11.414) | 1.61*** (14.839) | 1.34*** (8.452) | 1.13*** (9.835) |
| **HAR** | 1.89*** (7.150) | 1.61*** (12.178) | 1.66*** (16.113) | 1.05*** (6.868) | 0.83*** (11.220) | 0.82*** (8.520) | 1.71*** (25.720) | 1.18*** (7.002) | 1.21*** (10.910) |
| **HMP** | 2.11*** (8.534) | 1.08*** (8.251) | 1.76*** (15.362) | 1.14*** (6.510) | 1.47*** (12.255) | 0.56*** (3.474) | 1.88*** (9.129) | 1.31*** (10.929) | 1.29*** (9.823) |
| **JNK** | 2.51*** (11.630) | 2.07*** (5.985) | 3.14*** (6.549) | 0.24* (2.293) | 1.35*** (26.300) | 1.95*** (9.416) | 2.01*** (10.832) | 2.21*** (13.370) | 2.36*** (15.334) |
| **KRL** | -1.68$^{NS}$ (1.692) | 1.62*** (5.921) | 1.31*** (17.188) | 0.84*** (5.692) | 0.93*** (10.984) | 1.15*** (11.179) | 1.48*** (15.781) | 1.82*** (13.244) | 1.33*** (9.968) |
| **KTK** | 1.13. (1.919) | 0.99*** (13.430) | 1.30*** (10.597) | 1.27*** (3.100) | 1.60*** (16.276) | 1.11*** (11.390) | 1.33*** (14.810) | 1.57*** (10.588) | 1.20*** (10.054) |
| **MDP** | 1.100*** (3.769) | 0.82*** (4.716) | 1.41*** (20.460) | 0.66*** (4.507) | 0.72*** (12.279) | 1.94*** (6.030) | 1.31*** (8.173) | 1.40*** (9.263) | 1.09*** (7.893) |
| **MHR** | 1.32*** (8.500) | 1.05*** (9.981) | 0.91*** (9.076) | 1.67*** (8.392) | 1.06*** (14.072) | 0.99*** (13.588) | 1.32*** (22.640) | 1.29*** (17.440) | 1.01*** (12.225) |
| **ODS** | 1.96*** (5.09 | 0.82*** (8.01 | 2.61*** (5.86 | 1.07 (6.014) | 1.21*** (10.9 | 1.12*** (10.7 | 2.09*** (15.6 | 1.70*** (11.1 | 1.18*** (9.57 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | 8) | 5) | 9) | | 71) | 26) | 87) | 27) | 4) |
| **PNB** | 2.03*** (6.335) | 1.42*** (7.8920) | 1.65*** (13.084) | 1.81*** (6.839) | 1.00*** (11.098) | 1.84*** (8.363) | 1.65*** (9.912) | 1.96*** (8.213) | 1.64*** (8.761) |
| **RAJ** | 1.26*** (3.97) | 1.13*** (6.135) | 1.56*** (16.672) | 0.47* (2.741) | 1.17*** (9.617) | 1.39*** (6.817) | 1.69*** (10.556) | 1.51*** (8.901) | 1.37*** (7.910) |
| **TND** | 1.04. (2.059) | 1.19*** (7.579) | 1.30*** (12.057) | -0.42* (-2.851) | 1.23*** (11.284) | 1.05*** (9.825) | 1.35*** (11.478) | 1.53*** (8.512) | 1.12*** (8.327) |
| **UTP** | 1.97*** (6.460) | 1.67*** (7.616) | 1.52*** (18.823) | 1.05*** (8.325) | 1.24*** (11.109) | 1.90*** (5.939) | 2.12*** (8.526) | 1.62*** (11.504) | 1.52*** (8.739) |
| **WSB** | 2.44*** (7.627) | 1.33*** (8.250) | 1.73*** (18.908) | 1.13*** (13.27) | 1.20*** (14.700) | 1.19*** (8.973) | 1.22*** (9.206) | 1.78*** (8.595) | 1.37*** (10.051) |
| **Pooled** | 1.50*** (19.972) | 1.22*** (25.716) | 1.33*** (33.386) | 0.69*** (15.223) | 1.11*** (42.604) | 1.08*** (31.077) | 1.53*** (45.776) | 1.57*** (39.982) | 1.27*** (36.936) |

Values within parentheses indicate t-ratios for the elasticities; *** Significant at p = 0.001 level; ** Significant at p = 0.01 level;
* Significant at p = 0.05 level; . Significant at p = 0.10 level; NS Non-significant

activities has contracted with a rise in their output, which might be due to capital intensive behaviour of the activities, coupled with outmigration of the workers. Employment elasticity was less than unity in respect of a few cases, like (i) Electricity, Gas & Water Supply in Assam; Manufacturing and Mining & Quarrying, and Constructions in Bihar; Constructions, Transport, Storage & Communication in Gujarat; Transport, Storage & Communications, and Trade, Hotels & Restaurants in Haryana; Trade, Hotels and Restaurants in Himachal Pradesh; Electricity, Gas & Water Supply in Jammu & Kashmir; Electricity, Gas & Water Supply, and Transport, Storage & Communications in Kerala; Manufacturing and Mining & Quarrying in Karnataka; Manufacturing and Mining & Quarrying, Electricity, Gas & Water Supply, and Transport, Storage & Communications in Madhya Pradesh; Construction, and Trade, Hotels & Restaurants in Maharashtra;

Manufacturing and Mining & Quarrying in Odisha; and Electricity, Gas & Water Supply in Rajasthan. Further, pooled over all the 17 major states, Electricity, Gas & Water Supply was the lone activity to have registered a value of less than unity for employment elasticity (Table 5.1.1). Such cases (20 in all out of a totality of 162) constituted just 12.3 percent, wherein there was a possible indication of high labour productivity. Out of these 20 cases, Electricity, Gas & Water Supply sector had a frequency of 6, each of Manufacturing and Mining & Quarrying, and Transport, Storage & Communications had a frequency of 4, while each of Construction, and Trade, Hotels & Restaurants showed a frequency of 3. Obviously, these activities (which have portrayed relatively high labour productivity) are broadly capital intensive in nature.

### 5.2. Measurement of Structural Imbalance among the Indian States

For the purpose of measurement of structural imbalance, we have worked out relative shares of various economic activities in both employment (Rural, Urban as well as Total) and income. It may, once again, be mentioned that although we have made the computations for each of the 17 major states, yet the presentation has been made for the Punjab state alone due to the simple reason of saving space. Relative shares of the economic activities in employment have been given in Table 5.2.1, whereas those in GSDP (at current prices) have been given in Table 5.2.2.

A look at the Table 5.2.1 reveals that in the context of Punjab, share of agriculture and allied activities in total employment has perceptibly come down from 48.7 percent in 1993-94 to 24.7 percent in 2011-12. Out of this reduction of 23.9 percent points, a larger chunk (of 11.2 percent) of work force got absorbed by construction

## Table 5.2.1. Relative Shares of Major Economic Activities in Total Work Force in Punjab State

| YEAR | Economic Activity | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | AGFF | MNFG | CONS | EGWS | TSCM | THRS | FBRD | GNSR | AGGD |
| **RURAL** | | | | | | | | | |
| **1993** | 67.06 | 5.87 | 4.62 | 1.80 | 4.24 | 7.21 | 0.79 | 8.41 | 100.00 |
| **1994** | 67.02 | 6.04 | 4.98 | 1.68 | 4.33 | 6.86 | 0.77 | 8.33 | 100.00 |
| **1995** | 66.93 | 6.24 | 5.35 | 1.56 | 4.41 | 6.51 | 0.75 | 8.25 | 100.00 |
| **1996** | 66.79 | 6.44 | 5.75 | 1.45 | 4.49 | 6.18 | 0.72 | 8.16 | 100.00 |
| **1997** | 66.61 | 6.65 | 6.18 | 1.35 | 4.57 | 5.87 | 0.70 | 8.07 | 100.00 |
| **1998** | 66.38 | 6.87 | 6.63 | 1.26 | 4.65 | 5.56 | 0.68 | 7.97 | 100.00 |
| **1999** | 60.44 | 6.48 | 6.50 | 1.07 | 4.32 | 4.82 | 0.60 | 15.77 | 100.00 |
| **2000** | 58.70 | 6.71 | 7.55 | 1.03 | 4.68 | 5.44 | 0.61 | 15.28 | 100.00 |
| **2001** | 56.77 | 6.91 | 8.73 | 0.99 | 5.05 | 6.11 | 0.62 | 14.81 | 100.00 |
| **2002** | 54.65 | 7.10 | 10.05 | 0.95 | 5.43 | 6.83 | 0.63 | 14.35 | 100.00 |
| **2003** | 52.36 | 7.28 | 11.52 | 0.90 | 5.80 | 7.60 | 0.63 | 13.91 | 100.00 |
| **2004** | 49.90 | 7.44 | 13.13 | 0.86 | 6.17 | 8.41 | 0.63 | 13.46 | 100.00 |
| **2005** | 48.44 | 7.74 | 14.15 | 0.93 | 5.95 | 8.47 | 0.69 | 13.64 | 100.00 |
| **2006** | 46.87 | 8.17 | 15.19 | 1.00 | 5.71 | 8.5 | 0.75 | 13.80 | 100.00 |
| **2007** | 45.25 | 8.60 | 16.28 | 1.08 | 5.48 | 8.52 | 0.82 | 13.97 | 100.00 |
| **2008** | 43.61 | 9.04 | 17.41 | 1.17 | 5.24 | 8.51 | 0.89 | 14.14 | 100.00 |
| **2009** | 41.93 | 9.48 | 18.58 | 1.25 | 5.00 | 8.49 | 0.96 | 14.31 | 100.00 |
| **2010** | 40.23 | 9.92 | 19.78 | 1.34 | 4.76 | 8.45 | 1.04 | 14.47 | 100.00 |
| **2011** | 38.51 | 10.36 | 21.01 | 1.43 | 4.53 | 8.40 | 1.13 | 14.64 | 100.00 |
| **URBAN** | | | | | | | | | |
| **1993** | 9.99 | 24.53 | 5.77 | 2.01 | 6.76 | 26.81 | 3.2 | 20.92 | 100.00 |
| **1994** | 9.08 | 25.4 | 6.33 | 1.95 | 6.87 | 26.43 | 3.29 | 20.65 | 100.00 |
| **1995** | 8.22 | 26.19 | 6.92 | 1.89 | 6.95 | 25.95 | 3.38 | 20.5 | 100.00 |
| **1996** | 7.40 | 26.87 | 7.53 | 1.82 | 7.00 | 25.35 | 3.45 | 20.58 | 100.00 |
| **1997** | 6.62 | 27.36 | 8.13 | 1.74 | 6.99 | 24.58 | 3.49 | 21.09 | 100.00 |
| **1998** | 5.85 | 27.55 | 8.67 | 1.64 | 6.90 | 23.56 | 3.50 | 22.33 | 100.00 |
| **1999** | 5.08 | 27.23 | 9.09 | 1.52 | 6.70 | 22.18 | 3.44 | 24.77 | 100.00 |
| **2000** | 4.85 | 26.78 | 8.90 | 1.75 | 7.14 | 23.01 | 3.57 | 24.01 | 100.00 |
| **2001** | 4.63 | 26.29 | 8.70 | 2.00 | 7.60 | 23.83 | 3.70 | 23.24 | 100.00 |
| **2002** | 4.42 | 25.77 | 8.50 | 2.29 | 8.07 | 24.65 | 3.84 | 22.46 | 100.00 |
| **2003** | 4.21 | 25.23 | 8.28 | 2.62 | 8.56 | 25.45 | 3.97 | 21.68 | 100.00 |
| **2004** | 4.00 | 24.66 | 8.06 | 2.98 | 9.07 | 26.24 | 4.10 | 20.89 | 100.00 |
| **2005** | 4.01 | 24.76 | 8.17 | 2.84 | 9.19 | 25.94 | 4.19 | 20.90 | 100.00 |
| **2006** | 4.02 | 24.86 | 8.29 | 2.71 | 9.31 | 25.63 | 4.28 | 20.91 | 100.00 |
| **2007** | 4.03 | 24.96 | 8.40 | 2.58 | 9.42 | 25.32 | 4.37 | 20.92 | 100.00 |
| **2008** | 4.04 | 25.05 | 8.52 | 2.46 | 9.54 | 25.01 | 4.46 | 20.92 | 100.00 |
| **2009** | 4.05 | 25.15 | 8.63 | 2.34 | 9.65 | 24.70 | 4.56 | 20.92 | 100.00 |
| **2010** | 4.06 | 25.23 | 8.75 | 2.23 | 9.77 | 24.39 | 4.65 | 20.91 | 100.00 |
| **2011** | 4.06 | 25.32 | 8.86 | 2.13 | 9.89 | 24.09 | 4.75 | 20.91 | 100.00 |
| **TOTAL** | | | | | | | | | |
| **1993** | 48.73 | 11.86 | 4.99 | 1.87 | 5.05 | 13.51 | 1.56 | 12.43 | 100.00 |
| **1994** | 47.93 | 12.40 | 5.43 | 1.77 | 5.16 | 13.31 | 1.60 | 12.40 | 100.00 |
| **1995** | 47.04 | 12.94 | 5.88 | 1.68 | 5.26 | 13.09 | 1.64 | 12.47 | 100.00 |
| **1996** | 45.99 | 13.47 | 6.35 | 1.58 | 5.34 | 12.83 | 1.67 | 12.77 | 100.00 |
| **1997** | 44.66 | 13.92 | 6.82 | 1.48 | 5.38 | 12.48 | 1.69 | 13.55 | 100.00 |
| **1998** | 42.82 | 14.21 | 7.22 | 1.37 | 5.36 | 11.99 | 1.69 | 15.34 | 100.00 |
| **1999** | 40.01 | 14.14 | 7.45 | 1.24 | 5.20 | 11.23 | 1.65 | 19.09 | 100.00 |
| **2000** | 38.80 | 14.07 | 8.14 | 1.31 | 5.57 | 11.91 | 1.70 | 18.49 | 100.00 |
| **2001** | 37.55 | 13.98 | 8.87 | 1.38 | 5.96 | 12.61 | 1.74 | 17.90 | 100.00 |
| **2002** | 36.26 | 13.86 | 9.65 | 1.46 | 6.37 | 13.32 | 1.79 | 17.30 | 100.00 |
| **2003** | 34.93 | 13.72 | 10.47 | 1.54 | 6.78 | 14.03 | 1.83 | 16.70 | 100.00 |
| **2004** | 33.57 | 13.57 | 11.33 | 1.61 | 7.20 | 14.75 | 1.86 | 16.10 | 100.00 |
| **2005** | 32.28 | 13.91 | 11.97 | 1.63 | 7.15 | 14.80 | 1.96 | 16.29 | 100.00 |
| **2006** | 30.98 | 14.33 | 12.62 | 1.65 | 7.09 | 14.82 | 2.06 | 16.45 | 100.00 |
| **2007** | 29.69 | 14.74 | 13.29 | 1.67 | 7.02 | 14.82 | 2.15 | 16.61 | 100.00 |

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **2008** | 28.43 | 15.15 | 13.98 | 1.68 | 6.94 | 14.81 | 2.26 | 16.76 | 100.00 |
| **2009** | 27.18 | 15.55 | 14.69 | 1.69 | 6.86 | 14.77 | 2.36 | 16.90 | 100.00 |
| **2010** | 25.96 | 15.94 | 15.42 | 1.70 | 6.76 | 14.72 | 2.47 | 17.02 | 100.00 |
| **2011** | 24.77 | 16.32 | 16.16 | 1.71 | 6.66 | 14.66 | 2.57 | 17.14 | 100.00 |

**Source: Own calculations as based upon the interpolated information on work force as presented in Table 5.2.**

### 5.2.2. Relative Shares of Major Economic Activities in GSDP (at Current Prices) in Punjab State

| YEARS | Economic Activity | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | AGFF | MNFG | CONS | EGWS | TSCM | THRS | FBRD | GNSR | AGGD |
| 1993 | 46.12 | 15.04 | 4.19 | 2.55 | 3.32 | 12.09 | 8.16 | 8.53 | 100.00 |
| 1994 | 45.00 | 15.47 | 4.10 | 3.00 | 3.47 | 12.06 | 8.51 | 8.37 | 100.00 |
| 1995 | 43.11 | 15.77 | 4.81 | 3.54 | 3.88 | 11.57 | 8.68 | 8.64 | 100.00 |
| 1996 | 44.04 | 15.24 | 4.26 | 3.18 | 3.93 | 11.36 | 8.99 | 8.99 | 100.00 |
| 1997 | 42.06 | 15.06 | 5.33 | 2.88 | 4.28 | 11.34 | 9.07 | 9.99 | 100.00 |
| 1998 | 40.31 | 15.07 | 5.90 | 3.95 | 4.56 | 10.84 | 7.90 | 11.47 | 100.00 |
| 1999 | 37.53 | 14.94 | 4.38 | 3.44 | 4.70 | 12.17 | 9.12 | 13.71 | 100.00 |
| 2000 | 35.90 | 14.44 | 4.86 | 3.69 | 4.81 | 14.39 | 8.75 | 13.16 | 100.00 |
| 2001 | 34.97 | 13.11 | 5.00 | 4.66 | 5.39 | 14.90 | 9.02 | 12.97 | 100.00 |
| 2002 | 32.93 | 13.91 | 4.50 | 3.95 | 5.72 | 15.72 | 9.74 | 13.54 | 100.00 |
| 2003 | 32.77 | 13.61 | 5.03 | 4.37 | 6.38 | 15.11 | 9.59 | 13.15 | 100.00 |
| 2004 | 32.64 | 15.16 | 6.53 | 3.07 | 6.36 | 12.27 | 10.20 | 13.77 | 100.00 |
| 2005 | 31.80 | 14.99 | 7.11 | 3.56 | 6.28 | 12.34 | 9.92 | 13.99 | 100.00 |
| 2006 | 31.25 | 16.93 | 7.80 | 1.86 | 6.13 | 12.60 | 9.90 | 13.52 | 100.00 |
| 2007 | 31.52 | 17.72 | 7.65 | 2.05 | 5.83 | 12.66 | 9.56 | 13.00 | 100.00 |
| 2008 | 32.21 | 17.12 | 7.50 | 2.07 | 5.71 | 12.04 | 9.92 | 13.43 | 100.00 |
| 2009 | 30.60 | 18.08 | 7.59 | 2.00 | 5.91 | 12.07 | 10.11 | 13.65 | 100.00 |
| 2010 | 30.19 | 18.09 | 7.55 | 1.97 | 5.92 | 11.78 | 10.37 | 14.14 | 100.00 |
| 2011 | 29.85 | 17.50 | 6.83 | 1.81 | 5.34 | 11.79 | 10.98 | 15.89 | 100.00 |

**Source: Own calculations as based upon the compiled information on GSDP as presented in Table 5.3.**

sector, followed by manufacturing and mining/ quarrying sector (5.1 percent) and then closely by general services (4.7 percent) (which also includes public administration and defence). Thus, in the state of Punjab, work force has shifted grossly from low productivity agriculture sector not to high productivity manufacturing sector, but to comparatively less productive construction and general

services sector. The outcome does not present a healthy scenario for the state. As regards the shifts in relative shares of different sectors in income, share of agriculture in aggregated GSDP has also declined voluminously from 46.1 percent in 1993-94 to 29.8 percent in 2011-12 through 16.3 percent points. However, this reduction was observed primarily by general services (through 7.4 percent point), followed by financial & business services (2.82 percent), construction sector (2.64 percent), manufacturing (2.46 percent) and transport, storage and communication (2.02 percent). Thus the falling share of agriculture sector has been absorbed grossly by the least productive activities of tertiary-II sector, and only meagrely by high productivity manufacturing sector. Kuznets (1965) opined that, with economic development, labour shifts from low productivity agriculture to high productivity industrial sector. The major shift in structure in working force and national income away from agriculture imply not only an industrial revolution, providing more employment in non-agriculture sectors, but also an agricultural revolution in terms of major changes in technology and form of organisation (Sethi, 1997). However, the nature of structural shift observed in states like Punjab has been at gross variance with what ideally should have been there.

Further, on the basis of the distributive composition of different economic activities in employment as well as income, the values of index $\xi$ of structural imbalance (the methodology for which has already been outlined) were computed, at each of the regions, as also for the overall economy. We may mention that although such computations were made for each of the 17 states (Table 5.2.3), yet brief discussion has been made only for the Punjab state.

As per the table, computed values of the index $\xi$ in rural regions was higher in comparison to the urban regions. For instance computed values of the index for rural and urban regions were: 41.03 *versus* 33.14 during 1993-94; 52.02 *versus* 44.43 during 2004-05; and 43.38 *versus* 42.59 during 2011-12. As per Sethi (2002), value of $\xi$ is expected to be close to zero if the structural composition of the economic activities in employment is in a close harmony to such composition in income, but will be away from zero in case of disharmonious structural composition. On these grounds, the Table 5.2.3 clearly reveals that the extent of disharmony was relatively

larger in rural Punjab *vis-a-vis* urban Punjab. Further, severity of the extent of disharmony was observed to be particularly high during the first half of the decade 2000.

Information in respect of rest of the states could be squeezed out similarly from Table 5.2.3. However, in order to get an overall picture about the pattern of imbalanced structural composition, the computed values of the index $\xi$ were subjected to *two-way analysis of variance (ANOVA)*, separately for rural regions, urban regions and the overall economies (Table 5.2.4). It may be mentioned that the two factors considered in the ANOVA were 'States' and 'Years'. It is evident from the table that, on an average, there were highly significant differences (as gauged from the p-values for Snedecor's F). We may thus say that the major Indian states (region-wise as well as on the whole) have not been at a comparable level with respect to the extent of structural imbalance. Similarly, except for rural regions, the extent of structural imbalance among the states has not continued to remain

## Table 5.2.3. Computed Values of the Index ξ of Structural Imbalance among the Major Indian States, Separately for Rural and Urban Regions

| YEAR | State | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | ANP | | | ASM | | | BHR | | | GUJ | | | HAR | | | HMP | | | JNK | | | KRL | | | KTK | | |
| | Region | | | Region | | | Region | | | Region | | | Region | | | Region | | | Region | | | Region | | | Region | | |
| | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL |
| 1993 | 53.76 | 17.32 | 33.72 | 40.66 | 25.87 | 37.65 | 26.85 | 15.30 | 15.41 | 37.12 | 30.72 | 37.13 | 66.48 | 25.15 | 29.57 | 52.84 | 13.54 | 38.47 | 37.38 | 15.14 | 28.51 | 56.01 | 14.42 | 27.15 | 43.62 | 15.09 | 27.25 |
| 1994 | 53.53 | 17.43 | 33.15 | 36.86 | 22.92 | 32.84 | 29.82 | 19.26 | 17.56 | 34.64 | 26.63 | 33.44 | 59.02 | 26.08 | 23.92 | 48.70 | 15.62 | 36.12 | 43.78 | 19.77 | 34.91 | 49.61 | 12.06 | 24.16 | 45.74 | 15.65 | 27.40 |
| 1995 | 54.03 | 18.70 | 33.12 | 34.81 | 22.77 | 30.00 | 38.35 | 18.73 | 23.23 | 35.89 | 27.45 | 34.71 | 49.21 | 30.57 | 22.96 | 46.65 | 14.95 | 35.17 | 47.24 | 22.55 | 38.67 | 43.96 | 10.86 | 22.44 | 46.68 | 16.58 | 27.71 |
| 1996 | 53.73 | 19.74 | 32.30 | 35.03 | 23.13 | 29.36 | 44.59 | 26.62 | 25.90 | 33.02 | 26.05 | 31.32 | 41.13 | 31.71 | 19.78 | 45.66 | 16.92 | 35.46 | 50.83 | 31.54 | 42.16 | 39.53 | 12.20 | 23.89 | 47.09 | 17.14 | 26.70 |
| 1997 | 54.32 | 19.34 | 32.78 | 35.40 | 28.87 | 29.04 | 49.61 | 24.80 | 27.17 | 32.10 | 25.59 | 30.03 | 37.14 | 31.51 | 20.76 | 42.00 | 19.36 | 33.25 | 51.74 | 25.88 | 41.16 | 31.77 | 10.94 | 22.28 | 48.49 | 17.63 | 27.80 |
| 1998 | 55.07 | 23.62 | 33.22 | 31.79 | 33.88 | 24.66 | 51.23 | 34.75 | 26.31 | 31.26 | 26.21 | 28.20 | 30.82 | 32.20 | 17.18 | 41.04 | 26.61 | 33.68 | 55.45 | 30.08 | 44.99 | 29.45 | 12.66 | 24.11 | 51.79 | 18.97 | 27.86 |
| 1999 | 59.45 | 26.10 | 38.05 | 30.34 | 36.66 | 22.11 | 52.71 | 28.96 | 22.46 | 40.00 | 24.57 | 32.08 | 35.33 | 34.81 | 25.52 | 35.45 | 35.45 | 41.92 | 62.72 | 35.57 | 52.60 | 34.63 | 17.03 | 28.80 | 55.09 | 27.29 | 36.86 |
| 2000 | 58.34 | 27.91 | 38.17 | 34.32 | 41.63 | 25.27 | 65.42 | 27.34 | 26.92 | 42.52 | 23.04 | 31.35 | 40.77 | 33.98 | 27.63 | 38.93 | 38.93 | 37.34 | 60.19 | 35.81 | 51.01 | 39.18 | 23.70 | 34.43 | 54.78 | 29.25 | 38.66 |
| 2001 | 58.61 | 28.46 | 39.14 | 39.79 | 48.54 | 31.42 | 67.00 | 20.23 | 30.61 | 48.57 | 26.06 | 34.98 | 45.65 | 31.06 | 28.51 | 41.49 | 41.49 | 36.05 | 57.36 | 35.32 | 49.33 | 39.35 | 25.47 | 35.12 | 55.17 | 27.79 | 39.57 |
| 2002 | 57.44 | 29.20 | 41.61 | 41.04 | 50.69 | 32.98 | 72.84 | 17.87 | 29.68 | 51.98 | 21.35 | 33.01 | 49.31 | 28.76 | 29.44 | 40.97 | 40.97 | 31.91 | 54.24 | 35.01 | 47.42 | 37.89 | 23.87 | 33.43 | 57.30 | 27.54 | 40.12 |
| 2003 | 55.90 | 30.96 | 41.11 | 43.72 | 55.73 | 35.98 | 79.06 | 11.20 | 35.51 | 53.62 | 20.83 | 29.02 | 53.31 | 28.47 | 28.77 | 42.47 | 42.47 | 32.26 | 49.89 | 34.20 | 44.40 | 37.51 | 24.90 | 33.33 | 60.24 | 26.17 | 40.00 |
| 2004 | 56.58 | 32.09 | 43.62 | 42.79 | 59.12 | 33.76 | 82.86 | 9.60 | 38.33 | 58.78 | 18.52 | 29.55 | 58.11 | 25.92 | 29.46 | 43.68 | 43.68 | 19.58 | 43.37 | 30.09 | 39.11 | 35.90 | 20.88 | 30.52 | 62.06 | 25.69 | 36.83 |
| 2005 | 55.16 | 31.06 | 41.00 | 43.40 | 61.19 | 29.59 | 80.82 | 11.68 | 36.48 | 55.79 | 20.82 | 26.32 | 56.25 | 25.26 | 27.73 | 21.51 | 41.30 | 17.80 | 47.38 | 29.49 | 39.81 | 34.96 | 20.91 | 30.20 | 58.67 | 25.98 | 36.13 |
| 20 | 53. | 29. | 38. | 44. | 57. | 27. | 76. | 16. | 31. | 53. | 22. | 24. | 55. | 31. | 25. | 21. | 36. | 17. | 49. | 28. | 39. | 34. | 21. | 30. | 56. | 24. | 35. |

| | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **06** | 59 | 22 | 04 | 38 | 92 | 78 | 55 | 05 | 37 | 30 | 85 | 25 | 49 | 27 | 99 | 26 | 31 | 78 | 80 | 28 | 28 | 28 | 02 | 08 | 19 | 39 | 86 |
| **2007** | 52.82 | 31.69 | 37.25 | 50.70 | 55.05 | 28.74 | 73.03 | 16.12 | 31.72 | 51.04 | 25.09 | 23.09 | 53.54 | 35.74 | 23.49 | 20.44 | 34.79 | 16.79 | 52.47 | 28.01 | 39.16 | 33.73 | 21.21 | 30.06 | 53.61 | 23.95 | 35.10 |
| **2008** | 52.85 | 32.97 | 35.95 | 55.00 | 55.23 | 32.99 | 65.18 | 20.62 | 27.38 | 49.04 | 24.15 | 23.45 | 50.12 | 36.59 | 21.24 | 20.43 | 30.44 | 17.38 | 55.22 | 28.58 | 39.07 | 32.43 | 21.30 | 29.42 | 52.47 | 24.48 | 35.77 |
| **2009** | 52.66 | 34.48 | 35.01 | 60.28 | 54.46 | 40.30 | 50.85 | 20.27 | 21.59 | 46.03 | 25.39 | 22.32 | 47.48 | 36.73 | 19.63 | 19.90 | 29.39 | 16.87 | 57.76 | 29.67 | 38.98 | 31.13 | 21.26 | 28.72 | 50.38 | 24.23 | 34.06 |
| **2010** | 52.65 | 37.66 | 33.89 | 65.33 | 52.46 | 49.40 | 46.20 | 22.47 | 26.09 | 42.47 | 34.27 | 19.69 | 45.52 | 40.12 | 18.47 | 18.68 | 32.27 | 16.43 | 60.19 | 31.33 | 38.94 | 29.68 | 21.13 | 27.46 | 49.87 | 24.77 | 34.13 |
| **2011** | 50.64 | 36.49 | 32.12 | 65.49 | 46.09 | 51.80 | 38.37 | 29.91 | 28.00 | 40.51 | 36.85 | 20.19 | 42.01 | 50.26 | 13.21 | 22.75 | 28.74 | 19.48 | 63.10 | 37.08 | 42.49 | 28.87 | 22.00 | 27.14 | 54.66 | 24.22 | 35.38 |

**Table 5.2.3. Contd...**

| YEAR | State | | | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | MDP | | | MHR | | | ORS | | | PNB | | | RAJ | | | TND | | | UTP | | | WSB | | |
| | Region | | | | | | Region | | | | | | Region | | | | | | Region | | | | | |
| | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL | RRL | URB | TTL |
| 1993 | 58.51 | 17.49 | 29.70 | 49.48 | 20.84 | 32.86 | 79.52 | 23.22 | 52.81 | 41.03 | 33.14 | 27.55 | 57.71 | 16.94 | 35.03 | 32.42 | 21.87 | 28.74 | 65.29 | 18.94 | 40.40 | 63.77 | 20.91 | 36.49 |
| 1994 | 59.79 | 17.16 | 30.09 | 50.59 | 21.23 | 33.19 | 75.72 | 20.09 | 46.91 | 42.16 | 34.46 | 27.90 | 55.60 | 16.44 | 31.16 | 33.10 | 22.92 | 28.57 | 62.09 | 20.40 | 39.24 | 64.75 | 26.13 | 38.90 |
| 1995 | 61.65 | 17.60 | 31.01 | 52.22 | 22.55 | 34.33 | 72.61 | 19.16 | 42.06 | 41.77 | 34.42 | 26.94 | 55.44 | 17.23 | 30.25 | 35.68 | 25.50 | 29.96 | 59.40 | 22.64 | 39.28 | 65.27 | 30.52 | 40.24 |

| | | | | | | | | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1996 | 63.56 | 18.55 | 31.38 | 48.99 | 21.60 | 29.60 | 71.07 | 19.23 | 42.51 | 44.35 | 38.45 | 28.35 | 55.33 | 22.43 | 28.81 | 39.41 | 28.81 | 32.26 | 56.64 | 24.26 | 37.64 | 64.21 | 36.16 | 39.29 |
| 1997 | 65.05 | 19.48 | 32.77 | 48.56 | 21.14 | 29.48 | 64.89 | 19.48 | 37.22 | 44.36 | 38.96 | 27.15 | 55.50 | 23.29 | 29.21 | 41.53 | 30.46 | 32.91 | 54.11 | 26.99 | 38.40 | 65.49 | 43.53 | 41.75 |
| 1998 | 65.61 | 20.72 | 33.48 | 55.31 | 25.90 | 34.44 | 58.15 | 18.70 | 32.71 | 38.96 | 39.29 | 23.89 | 54.13 | 26.80 | 31.83 | 40.43 | 29.49 | 30.78 | 50.55 | 31.01 | 38.64 | 67.22 | 49.35 | 45.90 |
| 1999 | 70.86 | 19.85 | 36.13 | 58.90 | 29.48 | 37.15 | 54.92 | 16.64 | 33.25 | 47.26 | 40.95 | 28.32 | 59.61 | 27.13 | 33.82 | 41.30 | 30.73 | 30.73 | 52.36 | 33.50 | 41.13 | 66.33 | 50.85 | 44.90 |
| 2000 | 66.71 | 18.53 | 36.14 | 59.44 | 27.37 | 36.00 | 54.26 | 17.72 | 36.03 | 45.82 | 40.66 | 26.57 | 58.67 | 26.08 | 35.76 | 41.71 | 27.88 | 30.65 | 53.54 | 32.25 | 40.65 | 62.91 | 47.78 | 42.95 |
| 2001 | 63.39 | 19.25 | 34.78 | 59.19 | 28.34 | 37.42 | 54.32 | 21.85 | 39.88 | 46.45 | 40.69 | 27.92 | 57.24 | 29.61 | 36.30 | 47.10 | 26.87 | 33.56 | 55.56 | 31.64 | 41.24 | 59.74 | 46.06 | 41.03 |
| 2002 | 59.90 | 18.57 | 35.25 | 58.51 | 27.98 | 37.96 | 54.45 | 22.24 | 41.42 | 49.14 | 40.99 | 28.53 | 56.77 | 25.36 | 39.29 | 47.41 | 26.36 | 34.94 | 55.72 | 30.89 | 41.36 | 56.24 | 43.39 | 39.69 |
| 2003 | 54.63 | 20.72 | 31.86 | 57.10 | 27.62 | 37.28 | 51.27 | 26.18 | 43.02 | 48.84 | 41.94 | 27.69 | 52.64 | 32.91 | 35.57 | 49.20 | 22.01 | 34.56 | 55.14 | 29.37 | 39.25 | 51.35 | 41.00 | 37.16 |
| 2004 | 50.27 | 18.92 | 29.39 | 55.82 | 23.66 | 36.49 | 49.40 | 23.50 | 42.74 | 52.02 | 44.43 | 28.16 | 51.30 | 29.73 | 36.93 | 49.86 | 20.58 | 34.96 | 56.25 | 26.15 | 36.71 | 41.53 | 35.97 | 29.43 |
| 2005 | 53.62 | 19.14 | 30.23 | 54.23 | 22.67 | 34.73 | 46.72 | 20.22 | 38.78 | 48.85 | 42.60 | 25.90 | 49.81 | 29.37 | 35.12 | 47.96 | 18.93 | 32.99 | 53.92 | 24.94 | 35.57 | 42.73 | 37.85 | 29.63 |
| 2006 | 55.72 | 18.47 | 32.15 | 52.16 | 22.93 | 33.04 | 45.04 | 18.78 | 36.66 | 49.21 | 44.13 | 25.36 | 47.81 | 31.00 | 32.74 | 46.36 | 17.65 | 31.36 | 52.68 | 23.17 | 34.05 | 45.22 | 37.86 | 30.40 |
| 2007 | 60.15 | 17.31 | 31.46 | 50.73 | 23.26 | 31.86 | 42.52 | 19.92 | 33.34 | 46.12 | 44.19 | 23.12 | 47.70 | 33.68 | 32.72 | 47.34 | 18.09 | 31.82 | 51.41 | 22.71 | 33.59 | 47.04 | 41.32 | 30.23 |
| 2008 | 62.81 | 18.28 | 32.87 | 50.82 | 22.57 | 32.39 | 40.73 | 16.60 | 30.03 | 45.54 | 44.87 | 23.28 | 47.30 | 35.15 | 32.23 | 52.28 | 23.90 | 37.34 | 52.47 | 25.63 | 31.26 | 54.04 | 41.30 | 33.37 |
| 2009 | 64.77 | 18.70 | 33.69 | 46.75 | 21.45 | 29.24 | 38.58 | 14.76 | 26.61 | 44.02 | 42.91 | 22.54 | 45.89 | 33.54 | 30.86 | 51.88 | 24.52 | 37.24 | 50.54 | 25.03 | 28.92 | 54.52 | 45.90 | 31.15 |
| 2010 | 66.95 | 18.94 | 37.66 | 44.18 | 21.49 | 27.20 | 38.50 | 14.87 | 26.05 | 42.87 | 42.34 | 22.20 | 44.40 | 41.82 | 28.93 | 52.41 | 25.94 | 38.48 | 50.18 | 24.21 | 28.40 | 57.40 | 47.94 | 29.85 |
| **2011** | 68.82 | 20.50 | 39.34 | 46.55 | 27.54 | 29.29 | 42.38 | 12.38 | 26.91 | 43.38 | 42.59 | 23.55 | 42.93 | 46.60 | 28.53 | 42.00 | 17.29 | 27.56 | 53.26 | 30.37 | 30.64 | 62.23 | 49.47 | 30.83 |

**Source: Own Computations**

**Table 5.2.4. Two-way Analysis of Variance for Testing Significance of Difference between the Major Indian States with respect to the Extent of Imbalanced Structural Composition (Measured through ξ)**

| Source of Variation | Degrees of Freedom | Sum of Squares | Mean Square | Computed Value of Snedecor's F | p-Value for F |
|---|---|---|---|---|---|
| **(a) Rural Regions** | | | | | |
| **Between States** | 16 | 16592 | 1037.0 | $14.119^{***}$ | ≅ 0.0000 |
| **Between Years** | 18 | 1041 | 57.8 | $0.787^{NS}$ | 0.715 |
| **Residual** | 288 | 21152 | 73.4 | | |
| **Total** | 322 | 38785 | | | |
| **(b) Urban Regions** | | | | | |
| **Between States** | 16 | 18270 | 1141.9 | $37.360^{***}$ | ≅ 0.0000 |
| **Between Years** | 18 | 4106 | 228.1 | $7.463^{***}$ | ≅ 0.0000 |
| **Residual** | 288 | 8803 | 30.6 | | |
| **Total** | 322 | 31179 | | | |
| **(c) Overall Total** | | | | | |
| **Between States** | 16 | 6670 | 416.9 | $17.946^{***}$ | ≅ 0.0000 |
| **Between Years** | 18 | 1604 | 89.1 | $3.837^{***}$ | ≅ 0.0000 |
| **Residual** | 288 | 6690 | 23.2 | | |
| **Total** | 322 | 14964 | | | |

$^{***}$ **Significant at p = 0.001 level;** $^{NS}$ **Non-significant**

unchanged. In rural regions, however, there did not occur significant year-to-year changes in the values of the index ξ. That is to say, the severity of structural imbalance has remained persistent among the rural regions of the Indian states.

### 5.3. Interrelationship between Fiscal Deficit and the Measure ξ of Structural Imbalance among the Major Indian States

In this section, we have tried to study the nexus between fiscal deficit and the index ξ, with the sole objective to probe whether the index could be used as a significant determinant of fiscal deficit or not. For this purpose, we have first tried to study the relationship, if any, between fiscal deficit and the index ξ in isolation, separately

for rural regions, urban regions and the overall economies. For its accomplishment, we have sought the help of panel data based regression analysis.

It was observed that Nerlove's transformation of fixed effects modelling could provide us with the optimum results (as assessed through *Hausman's test*, duly coupled with *AIC*). As per the computations (Table 5.3.1), it was observed that for rural regions, in general, and for aggregated economies, in particular, there existed a

**Table 5.3.1. Fiscal Deficit *versus* the Index ξ − Rural, Urban and Total (Pooled Analysis over the Major Indian States)[#]**

| Region | Intercept | Regression Coefficient | $R^2$ | $\bar{R}^2$ | AIC |
|---|---|---|---|---|---|
| **Rural** | 3.825 (5.527) | 0.030* (2.343) | 0.017 | 0.017 | 2.412 |
| **Urban** | 5.084 (9.620) | 0.008$^{NS}$ (0.513) | 0.001 | 0.001 | 2.427 |
| **Total** | 2.571 (3.607) | 0.085*** (4.159) | 0.051 | 0.051 | 2.376 |

[#] Optimum results through the *Nerlove's* version of *random effects modelling*;
Values within parentheses indicate t-ratios;
*** Significant at p = 0.001 level; * Significant at p = 0.05 level; $^{NS}$ Non-significant.

direct and significant relationship between fiscal deficit and ξ. A close nexus between the two could thus imply that larger the extent of imbalance in structure of an economy, larger would expectedly be its fiscal deficit, and *vice-versa*. However, the relationship in respect of urban regions could not be detected to be significant. Such findings might possibly be due to the fact that rural regions not only account for a relatively larger chunk of the workforce, but also that the workforce is grossly faced with a severe problem of disguised employment (Krishna, 1973).

After having observed the presence of significant association between fiscal deficit and the index ξ in isolation, we shall now proceed to examine the effect of ξ in conjunction with the already identified important determinants of fiscal deficit among the major Indian states (Sethi and Teja, 2014). As per their findings, the chief concomitants of fiscal deficit happened to be: Revenue Receipts of Sales Tax (SLTX); Revenue Receipts of Non-Tax Revenue (NTRV); Revenue Receipts of States' Own Tax Revenue (SOTR); Revenue Receipts of Share in Central Taxes (SICT); Revenue Expenditure of Economic Services (EXES); Revenue Expenditure of Social Services (EXSS); Revenue Expenditure of Interest Payments & Servicing of Debt (IPSD); Revenue Expenditure of Non-Developmental Expenditure (NDEX);

GSDP of Primary sector (RSPR); GSDP of Secondary sector (RSSC); and Relative Share of Tertiary-1 sector in GSDP (RST1). In this part of the analysis, we have once again considered fiscal deficit as dependent upon the *cohort* of these concomitants *plus* $\xi$, and have re-carried out step-down panel data based multiple linear regression analysis, using $\min_{AIC}$ as the criterion of optimal choice. The analysis was carried out separately for rural regions, urban regions and then for overall economies (Table 5.3.2).

**Table 5.3.2. Results from Step-Down Panel Data Based Multiple Linear Regression Analysis, Separately for Rural Regions, Urban Regions and Overall Total[#]**

| Rural | | | | Urban | | | | Total | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **Determinant** | **Reg. Coeff** | **t-Value** | **p-Value** | **Determinant** | **Reg. Coeff** | **t-Value** | **p-Value** | **Determinant** | **Reg. Coeff** | **t-Value** | **p-Value** |
| **Intercept** | 0.5212 | 0.1408 | 0.8881 | **Intercept** | 2.2283 | 0.5886 | 0.5565 | **Intercept** | -3.6305 | -1.2110 | 0.2268 |
| **RSPR** | -0.0619$^{\cdot}$ | 0.1408 | 0.8881 | **RSPR** | -0.0667$^{\cdot}$ | -1.8836 | 0.0605 | **RSPR** | – | – | – |
| **RSSC** | -0.0854$^{\cdot}$ | -1.8858 | 0.0602 | **RSSC** | -0.1018$^{\cdot}$ | -1.9643 | 0.0504 | **RSSC** | -0.245$^{NS}$ | -0.6357 | 0.5254 |
| **RST1** | -0.2441$^{***}$ | -4.2659 | ≈ 0.000 | **RST1** | -0.2472$^{***}$ | -4.1943 | ≈ 0.000 | **RST1** | -0.1556$^{***}$ | -3.7845 | ≈ 0.000 |
| **SOTR** | 0.0454$^{*}$ | 2.0276 | 0.0434 | **SOTR** | 0.0451$^{*}$ | 2.0259 | 0.0436 | **SOTR** | 0.0398$^{\cdot}$ | 1.7952 | 0.0736 |
| **SICT** | 0.0442$^{\cdot}$ | 1.9537 | 0.0516 | **SICT** | 0.0497$^{*}$ | 2.2231 | 0.0269 | **SICT** | 0.0451$^{*}$ | 2.0423 | 0.0419 |
| **NTRV** | 0.0221$^{NS}$ | 1.0025 | 0.3169 | **NTRV** | 0.0194$^{NS}$ | 0.8845 | 0.3771 | **NTRV** | 0.0157$^{NS}$ | 0.7553 | 0.4506 |
| **SLTX** | 0.0002$^{NS}$ | 0.0061 | 0.9951 | **SLTX** | -0.0021$^{NS}$ | -0.0645 | 0.9486 | **SLTX** | 0.0073$^{NS}$ | 0.2281 | 0.8197 |
| **NDEX** | 0.0941$^{**}$ | 2.6466 | 0.0085 | **NDEX** | 0.0987$^{**}$ | 2.7760 | 0.0058 | **NDEX** | 0.0925$^{**}$ | 2.6001 | 0.0098 |
| **EXES** | 0.1422$^{***}$ | 3.8088 | ≈ 0.000 | **EXES** | 0.1433$^{***}$ | 3.8275 | ≈ 0.000 | **EXES** | 0.1129$^{**}$ | 3.0425 | 0.0025 |
| **IPSD** | 0.0997$^{**}$ | 2.8706 | 0.0043 | **IPSD** | 0.0949$^{**}$ | 2.7317 | 0.0066 | **IPSD** | 0.0835$^{*}$ | 2.4121 | 0.0164 |
| **EXIR** | 0.0248$^{*}$ | 1.9956 | 0.0468 | **EXIU** | 0.0018$^{NS}$ | 0.1021 | 0.9187 | **EXIT** | 0.0474$^{*}$ | 2.2189 | 0.0272 |
| **$R^2$** | 0.1979 | | | **$R^2$** | 0.1874 | | | **$R^2$** | 0.1887 | | |
| **$\bar{R}^2$** | 0.1906 | | | **$\bar{R}^2$** | 0.1804 | | | **$\bar{R}^2$** | 0.1823 | | |
| **F for $R^2$** | 6.9768 | | | **F for $R^2$** | 6.5183 | | | **F for $R^2$** | 7.2585 | | |
| **D.F. for $R^2$** | 11,311 | | | **D.F. for $R^2$** | 11,311 | | | **D.F. for $R^2$** | 10,312 | | |
| **p-value** | $1.48\times10^{-10}$ | | | **p-value** | $8.92\times10^{-10}$ | | | **p-value** | $2.52\times10^{-10}$ | | |
| **AIC** | 2.2869 | | | **AIC** | 2.3026 | | | **AIC** | 2.2910 | | |

**[#] Optimum results through the *Nerlove's* version of *random effects modelling***

**$^{***}$ Significant at p = 0.001 level; $^{**}$ Significant at p = 0.01 level; $^{*}$ Significant at p = 0.05 level; $^{\cdot}$ Significant at p = 0.10 level; and $^{NS}$ Non-significant**

It is interesting to note (from Table 5.3.2) that through clubbing of the index $\xi$ with the already identified determinants of fiscal deficit, the measure $\xi$ has continued to remain statistically significant and positive in sign, both in respect of rural regions and the overall economies. Moreover, list of the already identified determinants has remained virtually unchanged. We may thus say that besides other things, fiscal health of the Indian states would get adversely affected by way of disharmonious pattern of development in the states.

## 6. Concluding Remark and Policy Implications

We have thus seen that fiscal health of the major Indian states gets adversely affected, among other forces, by the severity of structural imbalance (in the distributive shares of different economic activities in output *vis-à-vis* that in employment). It thus implies that if we wish to see an improvement in 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 activities. As has already been emphasised by Sethi (2003b), for a permanent solution over a long period of time, measures need be taken to reduce disparities and structural imbalance in the Indian economy. For this purpose, efforts need be made not only to generate more employment, but also to generate employment in a manner such that the structure of employment becomes fairly commensurate with that of output. Promotion of non-farm activities (like bee keeping, dairying, poultry, piggeries, fisheries, *etc.*) and skill formation activities may further help in this direction.

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