

CHAPTER 4

STATE-WISE TRENDS AND PATTERNS OF ECONOMIC GROWTH IN INDIA

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This chapter deliberates the growth rate and performance of per capita net state domestic product (PCNSDP) of states as well as their sectoral composition in NSDP. Initially discuss the growth rate trend of PCNSDP of the states which is then followed by a discussion on the sectoral composition of NSDP and its growth rate of all the states. Further, in the last section detailed analysis of rank of the states in PCNSDP is discussed.

4.1 States-wise Growth Rate of Per Capita NSDP

The average growth rate of per capita NSDP for 18 major states along with all-India growth rate is presented in this section. For the estimation of growth rate semi-log trend analysis has been used.

The below given 4.1.1 table reveals the secular behavior of per capita NSDP estimated by fitting semi-log trend equation ($\ln Y_t = a + b_t$) for each state for the entire time period. The coefficient of time for all the states is positive which shows that per capita NSDP has a rising trend, though the R2 values differ across the states.

Table 4.1.1: Estimated Semi-log Trend Equation for PCNSDP of Each State at 2011-12 Prices

States	1991-92 to 2000-01			2001-02 to 2010-11			2011-12 to 2016-17			1991-92 to 2016-17		
	Intercept	Slope	R2	intercept	Slope	R2	Intercept	slope	R2	Intercept	Slope	R2
AP	-72.27	0.04	0.94	-136.57	0.07	0.99	-108.59	0.06	0.93	-102.17	0.06	0.99
AS	4.36	0.00	0.53	-60.33	0.04	0.97	-86.02	0.05	0.93	-39.81	0.03	0.90
BR	-24.33	0.02	0.43	-93.51	0.05	0.93	-87.92	0.05	0.96	-62.96	0.04	0.89
DL	-72.81	0.04	0.93	-138.90	0.08	0.99	-93.13	0.05	0.99	-91.57	0.05	0.97
GA	-113.51	0.06	0.91	-90.20	0.05	0.97	-70.96	0.04	0.24	-78.10	0.04	0.95
GJ	-84.13	0.05	0.69	-157.40	0.08	0.99	-155.85	0.08	1.00	-113.01	0.06	0.96
HR	-43.94	0.03	0.93	-126.93	0.07	1.00	-107.82	0.06	0.99	-97.16	0.05	0.97
HP	-87.28	0.05	0.98	-100.87	0.06	0.99	-122.92	0.07	1.00	-96.59	0.05	1.00
KA	-88.42	0.05	0.97	-121.14	0.07	0.97	-105.49	0.06	1.00	-90.62	0.05	0.99
KL	-81.24	0.05	0.97	-135.08	0.07	1.00	-90.89	0.05	0.99	-103.89	0.06	0.99
MH	-71.47	0.04	0.90	-146.28	0.08	0.98	-94.91	0.05	0.99	-95.97	0.05	0.97
MP	-35.75	0.02	0.77	-96.47	0.05	0.96	-96.18	0.05	0.99	-66.33	0.04	0.94
OR	-29.04	0.02	0.73	-120.52	0.07	0.96	-92.04	0.05	0.99	-75.91	0.04	0.96
PB	-38.54	0.02	0.98	-80.13	0.05	0.97	-64.47	0.04	1.00	-55.81	0.03	0.97
RJ	-67.35	0.04	0.79	-99.26	0.05	0.89	-68.53	0.04	0.98	-73.65	0.04	0.95
TN	-92.88	0.05	0.98	-162.25	0.09	0.98	-85.83	0.05	0.99	-109.94	0.06	0.97
UP	-17.64	0.01	0.81	-160.65	0.09	0.99	-95.36	0.05	1.00	-98.81	0.05	0.93
WB	-88.89	0.05	0.99	-92.50	0.05	0.99	-39.02	0.02	1.00	-80.22	0.05	0.99
AI	-26.50	0.02	0.28	-117.72	0.06	0.99	-96.58	0.05	0.99	-65.36	0.04	0.88

Source: Reserve Bank of India

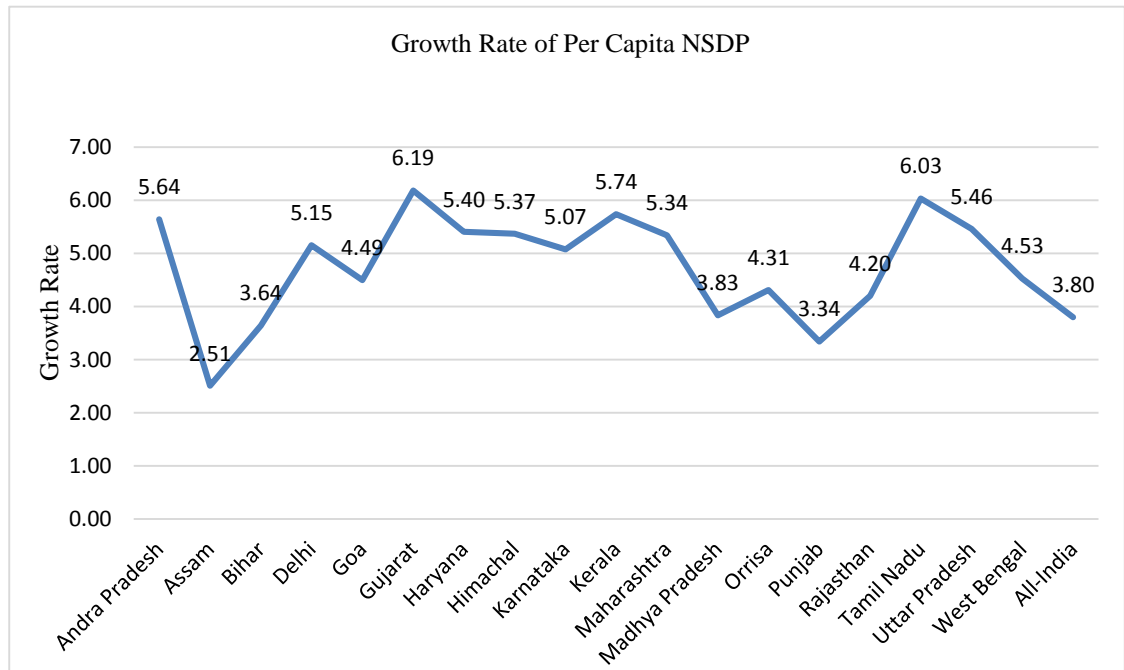
Note: AI-All India, AP-Andhra Pradesh, AS-Assam, BR-Bihar, DL-Delhi, GA-Goa, GJ-Gujarat, HR-Haryana, HP-Himachal Pradesh, KA-Karnataka, KL-Kerala, MP-Madhya Pradesh, MH- Maharashtra, OR-Orissa, PB-Punjab, RJ-Rajasthan, TN-Tamil Nadu, UP-Uttar Pradesh, WB-West Bengal.

States	1991-92 to 2000-01	2001-02 to 2010-11	2011-12 to 2016-17	1991-92 to 2016-17
Andhra Pradesh	4.14	7.35	5.96	5.64
Assam	0.29	3.53	4.80	2.51
Bihar	1.71	5.16	4.89	3.64
Delhi	4.22	7.51	5.23	5.15
Goa	6.27	5.10	4.14	4.49
Gujarat	4.74	8.39	8.32	6.19
Haryana	2.74	6.89	5.94	5.40
Himachal	4.90	5.58	6.68	5.37
Karnataka	4.96	6.59	5.81	5.07
Kerala	4.60	7.29	5.09	5.74
Maharashtra	4.12	7.85	5.29	5.34
Madhya Pradesh	2.30	5.33	5.32	3.83
Orissa	1.96	6.53	5.11	4.31
Punjab	2.47	4.55	3.77	3.34
Rajasthan	3.89	5.48	3.95	4.20
Tamil Nadu	5.18	8.64	4.84	6.03
Uttar Pradesh	1.39	8.54	5.29	5.46
West Bengal	4.96	5.14	2.48	4.53
All-India	1.85	6.40	5.35	3.80

Source: Reserve Bank of India

The annual growth rate of states obtained from semi-log curve is depicted in table 4.1.2. This table is derived to recognize the states which have grown more rapidly and sluggish than others. From the above table, it is observed that the Andhra Pradesh, Delhi, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Maharashtra, Tamil Nadu and UP are experiencing the high growth rate, whereas the states Bihar, Goa, Madhya Pradesh, Orissa, Punjab, Rajasthan and West Bengal achieved only the medium growth rate and the only state Assam achieved least growth rate over the time. It is important to note that all the states experienced positive growth rate but there are large fluctuations, which indicates an irregular trend across the state's growth throughout the whole time period.

Figure 4.1.1 Growth Rate of Per Capita NSDP for the Period 1991-92 to 2016-17



Source: Author's calculation

4.2 Sectoral Composition and its Growth Rate of NSDP

After reforms, the growth pattern has changed due to the change in economic structure which shifted the concentration from agriculture to service sector rapidly. The table 4.2.1 shows the sectoral composition and its growth rate of NSDP of different sectors of the states from 1991-92 to 2016-17 at constant prices of 2011-12. It seems that the share of primary sector has drastically declined in all the states apart from few states during the whole study period. It has declined to less than 14% in 2016-17 for some states such as Delhi, Goa, Himachal Pradesh, Karnataka, Kerala, Maharashtra and Tamil Nadu. In Goa, the share of primary sector has declined from 55.15 percent to 6.60 percent due to the faster growth in

secondary and tertiary sector. Subsequently, in Delhi, it has reduced from 23.98 percent to 3.48 percent. Punjab and Haryana which are known as the agriculture prosperous states' share have also declined during the entire period of study due to the faster growth rate of tertiary sector. The share of the secondary sector has also been slightly declined from 32.77% in 1991-92 to 29.01% in 2016-17, while in some states its share increased reforms such as Goa, Gujarat, Himachal Pradesh, Kerala, Madhya Pradesh, Punjab and UP. On the other hand, the share of Andhra Pradesh, Bihar, Delhi, Karnataka, Maharashtra, Orissa and West Bengal has declined. The share of the tertiary sector in aggregate income has increased for all the states especially in Delhi which is contributing more than 80 % in total NSDP in 2016-17. In overall, the results revealed that the tertiary sector continues to grow during the whole time period of the study, whereas the primary sector is depicting deteriorating trend in NSDP share.

Table 4.2.1: Sectoral Composition and its Growth Rate of NSDP in India from 1991-92 to 2016-17 at 2011-12 Constant Prices (in %)

States	Sectors	1991-92	2001-02	2011-12	2016-17	1991 to 2016 (CAGR)
Andhra Pradesh	Primary	39.99	33.74	26.37	25.57	4.49
	Secondary	25.88	26.89	26.55	19.73	5.67
	Tertiary	34.13	39.37	47.08	54.70	8.76
Assam	Primary	61.41	57.40	32.18	26.40	0.95
	Secondary	22.74	21.76	20.89	23.16	4.73
	Tertiary	15.85	20.84	46.93	50.44	9.70
Bihar	Primary	36.10	33.48	26.75	22.36	3.71
	Secondary	28.09	21.74	23.98	23.21	5.23
	Tertiary	35.81	44.77	49.27	54.44	7.40
Delhi	Primary	23.98	6.23	3.50	3.48	0.09

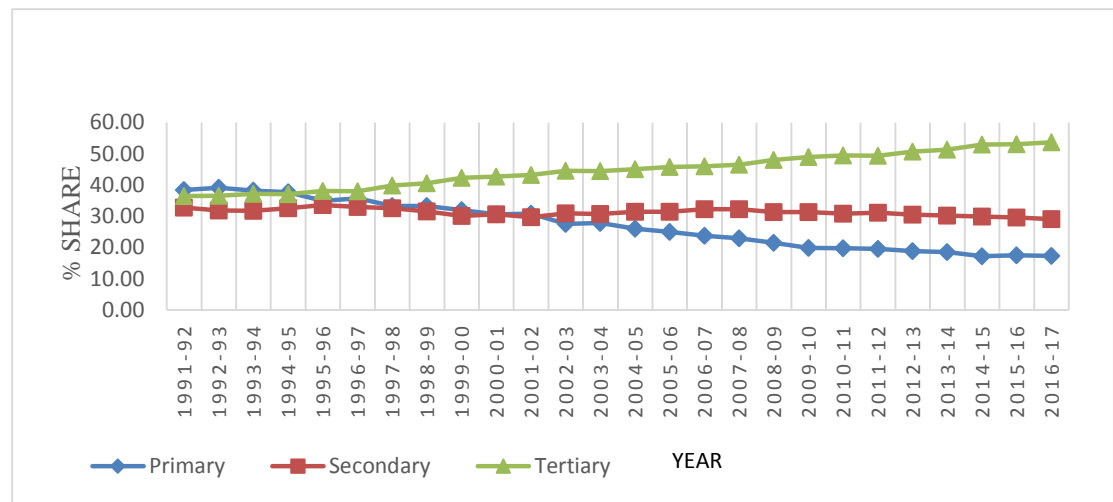
	Secondary	22.83	19.25	12.55	14.72	4.52
	Tertiary	53.19	74.52	83.95	81.80	9.01
Goa	Primary	55.15	34.97	21.45	6.60	-3.12
	Secondary	31.12	48.47	48.05	58.97	7.75
	Tertiary	13.73	16.56	30.51	34.43	9.22
Gujarat	Primary	44.81	35.68	25.36	22.20	3.95
	Secondary	25.45	27.38	36.01	42.00	9.40
	Tertiary	29.74	36.94	38.63	35.80	9.21
Haryana	Primary	48.94	37.22	24.63	18.79	2.55
	Secondary	29.12	31.07	30.37	29.19	7.04
	Tertiary	21.94	31.71	45.00	52.02	11.19
Himachal Pradesh	Primary	41.38	28.95	17.70	13.02	2.69
	Secondary	29.41	39.58	41.97	44.00	8.14
	Tertiary	29.22	31.47	40.33	42.98	8.82
Karnataka	Primary	32.89	21.86	14.69	10.76	1.84
	Secondary	29.13	28.08	27.67	24.37	6.25
	Tertiary	37.98	50.07	57.65	64.87	8.99
Kerala	Primary	40.42	28.32	14.21	8.32	0.28
	Secondary	20.96	23.69	27.88	26.61	7.32
	Tertiary	38.62	47.99	57.92	65.07	8.51
Madhya Pradesh	Primary	48.53	41.79	34.43	34.71	3.71
	Secondary	18.91	24.03	27.99	25.95	7.01
	Tertiary	32.56	34.18	37.58	39.33	6.68
Maharashtra	Primary	28.79	28.44	19.32	13.14	3.22
	Secondary	34.74	26.93	30.39	30.74	6.36
	Tertiary	36.47	44.63	50.29	56.12	8.67
Orissa	Primary	45.54	43.77	30.87	28.35	2.91
	Secondary	33.12	26.49	29.11	27.80	4.87
	Tertiary	21.34	29.75	40.02	43.85	8.23
Punjab	Primary	56.21	47.88	33.19	27.88	1.74
	Secondary	14.42	16.56	23.42	22.84	6.85
	Tertiary	29.37	35.57	43.39	49.27	6.94
Rajasthan	Primary	44.70	38.44	34.02	33.68	4.83
	Secondary	23.29	26.76	27.45	20.77	5.36
	Tertiary	32.00	34.81	38.53	45.55	7.46
Tamil Nadu	Primary	32.04	23.86	14.00	12.32	2.26
	Secondary	33.66	31.14	34.91	32.57	6.49
	Tertiary	34.30	44.99	51.08	55.11	8.89
Uttar Pradesh	Primary	44.71	40.82	27.04	23.79	2.18
	Secondary	22.90	22.35	29.35	27.89	6.35
	Tertiary	32.39	36.83	43.61	48.32	6.73

West Bengal	Primary	37.53	29.84	18.82	15.81	2.01
	Secondary	16.73	16.11	15.03	14.61	5.65
	Tertiary	45.74	54.05	66.15	69.58	7.85
All-India	Primary	38.42	30.84	19.55	17.32	2.80
	Secondary	32.77	29.64	31.13	29.01	6.32
	Tertiary	36.39	43.20	49.31	53.66	8.41
<i>Source:</i> Author's calculation from EPW Research Foundation						

In addition to this, the sectoral growth rate of the NSDP is also shown in this table from 1991-92 to 2016-17. It can be seen that the primary sector growth has the largest variation, it varies from -3.12% to 4.83%. The secondary sector growth rate lies between 4.52% to 9.40%. While the tertiary sector has the lowest variation, its growth rate varies from 6.68% to 11.19%.

Table 4.2.2: Top and Bottom Three States in Terms of Growth Rate of NSDP for the Period 1991-92 to 2016-17		
Primary	Secondary	Tertiary
Top three (ascending order)		
Rajasthan	Goa	Goa
Andhra Pradesh	Gujarat	Assam
Gujarat	Himachal Pradesh	Haryana
Bottom three (ascending order)		
Kerala	Bihar	Punjab
Delhi	Assam	Uttar Pradesh
Goa	Delhi	Madhya Pradesh
<i>Source:</i> Above table 4.2.1		

Figure 4.2.1 Trends of the Share of Each Sector in Aggregate Net Domestic Product of India for the Period 1991-92 to 2016-17.



Source: Researcher’s Calculation

4.3 Inter-temporal Movement and State-wise Performance in Rank Analysis

This section presents the detailed analysis of the rank performance of the states in PCNSDP. Firstly, rank of all states is calculated in terms of per capita income and then the matrix of coefficient of correlation is calculated of the ranks to confirm that the rank has not changed significantly over the time. Further, in order to check the consistency between the rankings of the states, Kendall’s coefficient of concordance (W) statistics is used. Moreover, Index of rank concordance method is applied in order to verify the results of Kendall’s coefficient of concordance.

The table 11 depicts (refer to appendix) the rank of different states at 2011-12 prices for the period 1991-92 to 2016-17. It can be seen that the rank of the states had not changed significantly over the time, except for three states (Assam, Gujarat and Punjab). It is very surprising that the rank of Punjab deteriorated

drastically from 3rd to 11th because of the reduction in development expenditure, indebtedness among farmers, high unemployment rate and lowest working population ratio (Sanga & Shaban, 2017). The position of Assam also deteriorated and Bihar remained consistently bad because their development expenditure is less than the all India average. The socio-economic indicators also reflect the backwardness of the region. On the other hand, position of Gujarat improved because of strong industrial base, a well-developed tertiary sector and the performance of human development indicators above the all India average. Goa and Delhi consistently gripped the 1st and 2nd rank over the time except in 2013-14 their positions got interchanged. Further, from the table 12 (refer to appendix), it can be seen that the coefficient of correlation is also high for all the states which implies that there is a high degree of consistency in the relative position of the states over the time. It can be said that the poor states remained poorer and rich states remained richer.

4.3.1 Kendall's Coefficient of Concordance (W) Statistics

$$W = \frac{12s}{m^2(k^3 - k)}$$

In our case, $m = 26$, $k = 18$ and $s = 304684$ and hence the value of Kendall's (W) statistics = 0.9302, which is very close to 1 confirms the high degree of consistency over the time between the ranking of the states.

4.3.2 Index of Rank Concordance

Boyle and McCarthy (1997) developed a simple measurement to assess the inter-temporal mobility of states or countries in terms of the ranking on the basis of the income level. This measurement is used to verify the results of Kendall's W Statistics. Actually, they advocated the two versions: -

(a) Multiannual Version (RC_t)

$$RC_t = \frac{\text{Var}[\sum_{t=0}^T R(Y_{it})]}{\text{Var}[(T + 1) * R(Y)_{i0}]}$$

(b) Binary Version (RC_{at})

$$RC_{at} = \frac{\text{Var}[R(Y)_{it} + R(Y)_{i0}]}{\text{Var}[2 * R(Y)_{i0}]}$$

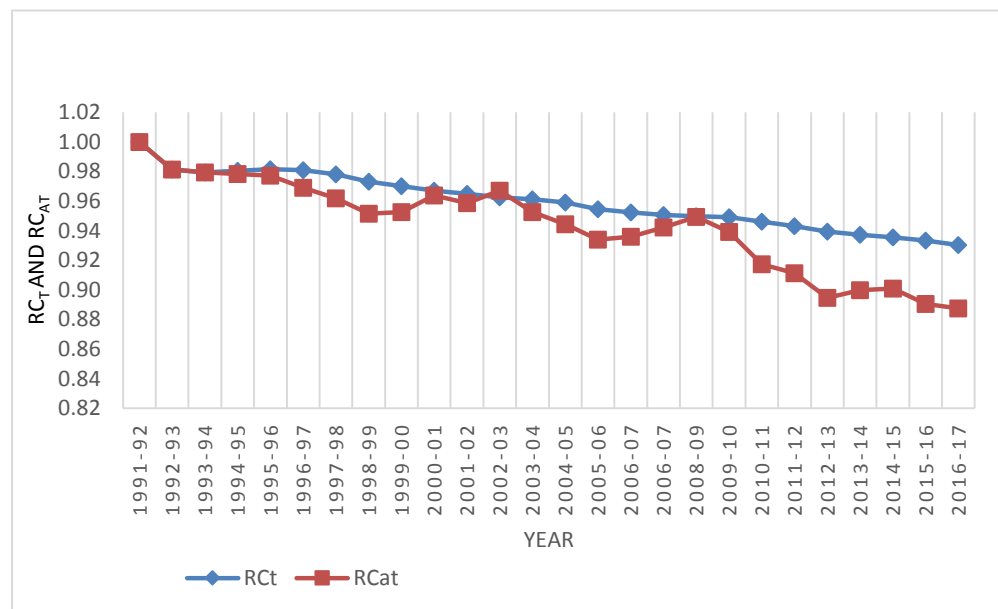
4.3.2.1 Inter-temporal Movement of RC_t and RC_{at}

Inter-temporal Movement of RC_t and RC_{at}					
Years	RC_t	RC_{at}	Years	RC_t	RC_{at}
1991-92	1	1	2004-05	0.9589	0.9442
1992-93	0.9814	0.9814	2005-06	0.9545	0.9339
1993-94	0.9793	0.9793	2006-07	0.9523	0.9360
1994-95	0.9803	0.9783	2006-07	0.9507	0.9422
1995-96	0.9815	0.9772	2008-09	0.9498	0.9494
1996-97	0.9808	0.9690	2009-10	0.9491	0.9391
1997-98	0.9780	0.9618	2010-11	0.9460	0.9174
1998-99	0.9731	0.9514	2011-12	0.9430	0.9112
1999-00	0.9700	0.9525	2012-13	0.9394	0.8947
2000-01	0.9669	0.9638	2013-14	0.9371	0.8998
2001-02	0.9648	0.9587	2014-15	0.9356	0.9009
2002-03	0.9626	0.9669	2015-16	0.9333	0.8906
2003-04	0.9611	0.9525	2016-17	0.9302	0.8875
<i>Source: Author's Computation</i>					

The above table 4.3.2.1 depicts the results of index of rank concordance. The value of the rank concordance coefficient lies between 0 to 1. The closer the value

to 0 indicates the greater extent of mobility within the distribution and vice versa. It can be observed from the table that both the series have a downward trend. Though, the binary measures (RC_{at}) fluctuate more. It is important to note that the value for both the series RC_t and RC_{at} came down gradually from unity to 0.93 and 0.88 respectively over the time. But still the values are high, therefore these results verify our previous findings that the mobility of the states within the whole distribution has been very low which implies that the relative position of the states remained almost same over the time.

Figure 4.3.2.1 Inter-temporal Movement of RC_t and RC_{at}



Source: Author’s Calculation.

4.3.3 Overall Performance of the States in Ranks

To get an idea about the states average ranking and the variability relative to the other states average rank and the standard deviation of the ranks among the states is depicted in table 4.3.3.1 for the entire period 1991-92 to 2016-17. It revealed

that the fluctuation is largest in case of Punjab, Assam, Gujarat, West Bengal, Maharashtra, Uttar Pradesh, Tamil Nadu, Karnataka and Kerala while in case of Delhi and Goa fluctuations are very smaller. It is important to note that the Bihar is the worst state w.r.t. its mean value and the SD. The value of SD is zero which confirms that the performance of Bihar remains consistently bad over the time.

Table 4.3.3.1: Overall Performance of States during 1991-92 to 2016-17				
States	Rank			
	Average	SD	No of worse years	No of better years
Andhra Pradesh	10.77	0.65	19	7
Assam	15.08	2.23	14	12
Bihar	18.00	0.00	0	0
Delhi	1.96	0.20	25	1
Goa	1.04	0.20	1	25
Gujarat	8.92	2.10	20	6
Haryana	3.65	0.85	12	14
Himachal Pradesh	7.50	1.03	15	11
Karnataka	6.12	1.24	10	16
Kerala	6.12	1.24	11	15
Madhya Pradesh	15.58	0.90	17	9
Maharashtra	5.19	1.39	7	19
Orissa	15.77	0.99	12	14
Punjab	5.85	3.09	12	14
Rajasthan	13.12	0.95	8	18
Tamil Nadu	9.08	1.26	10	16
Uttar Pradesh	13.23	1.27	12	14
West Bengal	14.04	1.73	7	19
Source: Author's Computation				

Note: The number of worse or better years calculated that by the number of times a state has exceeded or fallen short of its average rank.

4.4 Concluding Remarks:

This chapter mainly discusses the growth performances of the states in terms of per capita NSDP and their sectoral composition in NSDP after reforms. Rank analysis has also been carried out for the better presentation of results. For the convenience results are discussed region wise.

Beginning with the **northern** states: Haryana, Himachal Pradesh, Punjab and Delhi, these states are among the richest states in the country except Punjab. During the study time period 1991-92 to 2016-17, Haryana, Himachal Pradesh, Delhi achieved high growth rates in terms of per capita NSDP while Punjab achieved only medium growth rate. Although, the performance of Punjab was good in pre-reforms period but after-reforms it sees a decline in its position. The rank of Punjab has been declined from 3rd to 11th over the time in terms of per capita income. However, since 2000s the economy recovered higher growth rate than what was registered in 1990s due to enhanced growth rate of secondary and tertiary sectors. But the problems such as deceleration in primary sector growth, high unemployment rate, lower worker population ratio, indebtedness among farmers continues to persist (Sanga&Shaban, 2017). Further, Soda (2010) argued that the state of public finance of Punjab has been squeezed the capital outlay and development expenditure in the state over the last 25 years on the name of management of public finance.

At the sectoral level, in Delhi the overall production shifted from primary and secondary sector to tertiary sector while in case of Himachal Pradesh and Punjab, it is shifted from primary to secondary and tertiary sector. In the state of Haryana

production shifted directly from agriculture to tertiary sector, secondary sector's share remained almost the same over the time.

Western India comprising of Goa, Gujarat and Maharashtra are the most economically developed states of the country. All of these states have high growth rate in per capita NSDP except Goa, but more than the all India average. Growth rate of secondary and tertiary sectors are also higher than the all India average growth rate because these states have a good industrial base and a well-developed tertiary sector. All of these states have been among the top five in terms of ranking in per capita NSDP in 2016-17. Since 1991, Goa has consistently gripped the first rank only except in 2013-14; interchanged their position with Delhi. However, in recent years, the economy of Gujarat superseded Maharashtra in its performance. One of the probable reasons could be comparatively higher development expenditure of Gujarat over the years, higher than the all India average.

The **central region** comprising of Madhya Pradesh, Rajasthan and Uttar Pradesh achieved only medium growth rate except UP for the entire study time period 1991-92 to 2016-17. These states are very populous, comprise approx. 1/3rd of the total population together. Economically, these regions are the significant contributors to the primary sector together. Being rich in mineral resources, its secondary sector growth rate is higher than the all India average except in Rajasthan though has not really taken off as the western, southern or north-western region. While the growth of the tertiary sector and its contribution in aggregate output is below than the national average in all these three.

Moving to the **East**, this region comprises of four states such as Assam, Bihar, Orissa and West Bengal. These states achieved only medium growth rate except Assam in terms of per capita NSDP during the entire study period. Growth rate of Assam was least among the all major 18 states during the whole study time period except in 2011-12 to 2016-17. All of these states come under the bottom five in terms of ranking in per capita NSDP in 2016-17. In which Bihar consistently remained at the bottom last position. Recurring floods and drought in certain areas of Bihar and Orissa not only have an adverse impact on agriculture and livestock but also on the livelihood of people dependent on them. Assam is also facing the problems of geographical terrain insurgency, ethnic movements, foreign (Bangladeshi) infiltration, lack of intra-regional and intra state connectivity/transport and trade, infrastructure and governance etc. (Das 2005, Barua & Das, 2008).

The **southern** region consisting of Andhra Pradesh, Karnataka, Kerala and Tamil Nadu, all of these states are leading contributors to the national income and fast growing region in terms of per capita growth rate of NSDP after the reforms period. The sectoral level, also achieved good growth rate.