

Growth and Poverty in India—An Empirical Analysis

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Abstract : This paper examines the nature of the growth of per-capita real income and the behavior of income poverty across the states of India during the period from 1972-73 to 2009-10 on the basis of the data available from various rounds of NSSO and also from Planning Commission of India. It also tries to find out the correlates of declining trend in poverty both across time and across the states. Attempts have also been made to examine (i) whether the high growth states have experienced higher rates of fall in the incidence of poverty and (ii) to what extent the cross-state and cross-time variations in the rate of decline in poverty could be explained in terms of the variations in social sector expenditure, growth rates and inequality in a panel framework. Almost all the states have been found to have experienced positive rates of growth of per-capita real income in varying degrees during the three phases of our analysis. We find that growth rates and social sector expenditure are the most significant explanatory factors behind the declining trend in poverty across states and over time.

Key-words : Poverty, growth, India, panel data.

1. Introduction

The elimination of poverty has been one of the major policy goals in India since her emancipation from the British colonial rule. Several policies including the introduction of various workfare programmes have also been adopted since the inception of the strategy of planned development. One can categorize the operation of these policies into four different phases. In the first phase, we followed the policy of growth-led development strategy during the period from 1950-51 to mid 70's such that it was exclusively based on what is known as "Trickle Down" hypothesis. The basic idea was that the fruits of growth would automatically percolate amongst all classes of people irrespective of gender, caste, religion, income status as well as region. But unfortunately even at the middle of the 70's about 50% of our total population were found to suffer from abject poverty. So the trickledown theory failed and in the second phase, namely, from mid 70s to 1990 we have switched over to the policy of growth cum public action-led development strategy for direct attack on the poverty through the persuasion of different workfare programmes. So the idea of participatory development process was implicit in all these strategies which were followed up to the end of 80's. But in the second phase the strategy of development also failed to proceed in the desired direction and the proportion of our total population lying below the poverty line was around 39% at the end of 80's and this was accompanied by high degree of inequality in the distribution of income also. Thereafter in the third phase we followed the policies of economic reforms along with the strategy of growth cum public action since 1991. But it could not provide much cushion against the abject poverty of the vast majority of our population living in both rural and urban areas. Finally, we declared the policy of

inclusiveness in the 11th five year plan and incorporated this as an objective in the 12th plan in the form of sustainable faster inclusive growth.

But what is surprising is that our economy has been on the trajectory of high-growth path during the post reform period especially from 1997-98 to 2007-08 such that the growth rates hovered around 7 to 9 percent. Of course this high growth rates have placed India as one of the fastest growing country in the globe albeit this growth rate was the result of service sector revolution. Interestingly, one distressing fact is that this high growth rate has failed to provide any cushion against the tremendous poverty, quality of life of the poor people and also against high rate of unemployment. In fact, this service sector driven growth has been almost jobless such that the employment elasticity has fallen tremendously during the post reform period. Parallely, of course there has been an increasing trend in the share of social sector expenditure at the total planned expenditure but in real term this increase has not been sufficient enough to produce much dent on the problem of poverty and unemployment. Under this backdrop this paper examines the nature of the growth of per-capita real income and the behavior of income poverty across the states of India during the period from 1972-73 to 2009-10 on the basis of the data available from various rounds of NSSO and also from Planning Commission of India. It also tries to find out the correlates of declining trend in poverty both across time and across the states. Attempts have also been made to examine (i) whether the high growth states have experienced higher rates of fall in the incidence of poverty and (ii) to what extent the cross-state and cross-time variations in the rate of decline in poverty could be explained in terms of the variations in social sector expenditure, growth rates and inequality in a panel framework. The rest of this paper is designed as follows. Section II presents data and methodology; Section III examines the nature of growth across the states; Section IV highlights on the analysis of poverty; Section V presents the results of panel data analysis and finally Section VI represents concluding observations.

2. Data and Methodology

This study is exclusively based on secondary data. We have used the data on per capita NSDP from the RBI online data base. The per capita NSDP (PCNSDP) has been expressed at constant 1993-94 prices using implicit price deflator. To classify the states into the category of high growth and low growth we have computed annual compound growth rate for the period of 1972-73 to 2009-10 of each state and then the median growth rate. The states having growth rate higher than the median growth rate are called high growth states and the states having growth rates less than the median growth rate are called low growth state. The data on poverty and social sector expenditure have been taken from reports of Planning Commission. Data on inequality (Gini Coefficients) have been taken from reports of various rounds of quinquennial large sample surveys of NSSO. We use the following forms of model specification.

$$POV_{it} = f(\text{Constant, } SSE_{it}, GRPCNSDP_{it}, INQ_{it}), \dots \dots \dots (I) \quad i = 1, 2, \dots, 16 \text{ (states),} \\ t = 1, 2, \dots, 8. \text{ (time)}$$

Our Panel is a balanced panel.

The basic model that we have used is as follows:

$$Y = \alpha + \beta X_{it} + \epsilon_{it} \quad (1)$$

Where, $i = 1, 2, \dots, N$ ($N = 16$) and $T =$ number of time periods (8) at five year interval from 1973-74 to 2009-10; ϵ_{it} = the error component of the disturbance terms; α is the intercept or scalar and β is $K \times 1$ and X_{it} is the i -th observations on K explanatory variables. For fixed effect model we decompose the error term as: $\epsilon_{it} = v_i + u_{it}$. Here, v_i is the unit specific residual and u_{it} is the usual residual with standard properties. So the model becomes

$$Y = \alpha + \beta X_{it} + v_i + u_{it} \quad (2)$$

Now if v_i 's are assumed to be fixed parameters to be estimated then the model becomes the fixed effect model. The fixed effect model seems to be appropriate in our study.

3. Analysis of growth of Real Per Capita NSDP

This section is devoted to the analysis of the growth of per capita real NSDP across the 15 major states by dividing the total period from 1972-73 to 2009-10 into three phases: i) Pre reform period from 1972-73 to 1989-90, ii) Post reform period from 1991-92 to 2009-10 and finally the overall period ranging from 1972-73 to 2009-10. We have computed the median value of growth for the three separate phases and classified the states as high growth and low growth states on the basis of the median value. Table 1 gives an overview of the annual average growth rate of per capita real NSDP (GPCNSDP) for the three phases such that all the states have achieved positive growth rate of per capita real NSDP in each of the three phases in varying degrees. However, the average (median) growth rates of all the states are found to be lower (2.28% p.a.) for the pre-reform period than the same for the post reform period (4.15% p.a.) as well as for the overall period (3.11% p.a.) So it is obvious that the states on the average have achieved higher growth rates of per capita income in the post reform period in varying degrees as compared to the same in the pre reform period and overall period.

Taking median growth rate for the pre reform period (2.28% p.a.) as a benchmark we find that the high growth states were Andhra Pradesh, Gujarat, Haryana, Karnataka, Punjab, Maharashtra, Tamil Nadu and Rajasthan. Whereas the low growth states were Orissa, Bihar, Assam, Uttar Pradesh, Madhya Pradesh, West Bengal and Kerala in the first phase (i.e. during the pre-reform period). The Table-1 below gives a clear overview of the states in respect of their performance. Interestingly the state of Maharashtra has achieved the highest annual average growth rate (3.67% p.a.) followed by Gujarat (3.26% p.a.), Andhra Pradesh (3.11% p.a.), Punjab (3.04% p.a.), while the states achieving lowest growth rates are Madhya Pradesh (0.43% p.a.) followed by Kerala (0.57% p.a.) and Assam (0.92% p.a.). So the leading states in respect of growth during the pre reform period are Maharashtra, Gujarat, and Punjab etc. It follows from Table 1 that there have been dramatic increase in the rates of growth of per capita income in real terms during the post reform periods for some of the states (like Tamil Nadu, Maharashtra, Kerala, Karnataka, Gujarat, Andhra Pradesh, Haryana and even Orissa).

Table-1 : Growth Rates of PCNSDP (At 1993-94 Prices) of Major Indian States in the Pre and Post Reform Period

States	Pre-reform ACGR	Post Reform ACGR	Overall ACGR
Andhra Pradesh	3.11(3)	4.45(6)	3.55(4)
Assam	0.92(13)	1.76(14)	1.49(15)
Bihar	1.62(9)	2.49(12)	2.35(12)
Gujarat	3.26(2)	5.35(1)	3.68(3)
Haryana	2.67(6)	4.22(7)	3.49(5)
Karnataka	2.65(7)	5.06(5)	3.43(6)
Kerala	0.57(14)	5.31(3)	3.26(7)
Madhya Pradesh	0.43(15)	2.88(11)	1.93(14)
Maharashtra	3.67(1)	5.24(4)	4.35(1)
Orissa	1.54(11)	4.15(8)	2.52(11)
Punjab	3.04(4)	2.89(10)	2.89(10)
Rajasthan	2.87(5)	2.99(9)	3.10(9)
Tamil Nadu	2.28(8)	5.35(1)	3.99(2)
Uttar Pradesh	1.47(12)	2.01(13)	1.95(13)
West Bengal	1.58(10)	0.42(15)	3.11(8)
All India	4.36	6.23	5.29
Median Growth	2.28	4.15	3.11

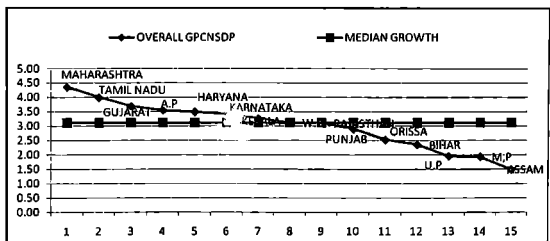
Source : Author's computation from RBI on line data base (figures in brackets give respective ranks)

Interestingly all the states excepting Punjab and West Bengal have experienced increase in the per capita real income during the post reform period. The proximate explanation for the lower growth rates experienced by Punjab and West Bengal seems to be the tremendous fall in the agricultural productivity. However, the average growth rate (median) across the states has been 4.15% p.a. Using this growth rates as a benchmark, it is seen from Table 1 that whereas Andhra Pradesh, Gujarat, Haryana, Karnataka, Kerala and Maharashtra have achieved the status of high growth states, the Orissa remains on the border line and other states are recorded as low growth states. It is interesting to note that all the high growth states (excepting Punjab and Rajasthan) in the pre reform period have been able to maintain the status of high growth in the post reform period also. Surprisingly, Punjab and Rajasthan have slipped from their status during the post reform period. Now if we compare the relative position of the states in terms of their ranking as given in Table-1 we find a significant change in the value of the ranks across the states in varying degrees between pre and post reform periods. Interestingly while Tamil Nadu has been able to bring about remarkable improvement over its ranks of growth of per capita real income from the pre reform period (8th) to the post reform

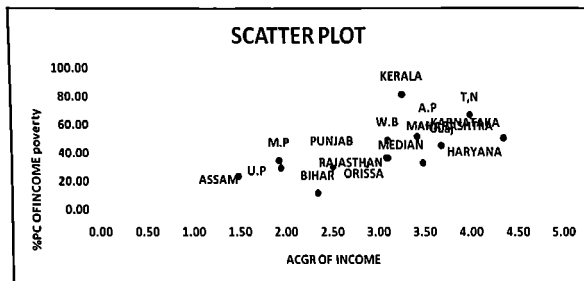
period by topping the list of status, status of Gujarat has remained stagnant and that of Maharashtra which was topper in the pre reform period has fallen to the rank of 4 albeit their annual growth rates of real per capita income are much higher during the post reform period. Another feature of the nature of growth has been that the median growth rate is higher (3.11% p.a.) during the overall period than that in the pre reform period (2.28% p.a.).

On the other hand, it is clear from figure-1 that the states like Andhra Pradesh, Gujarat, Haryana, Maharashtra, Karnataka and Tamil Nadu have been able to maintain their status of high growth over the entire period (1972-73 to 2009-10) while West Bengal remains on the border line i.e. on the median value and the rest of the states have failed to achieve even the median growth rate during the same period. If we consider the relative positions of the states in terms of their growth rates of per capita real income, we find that Maharashtra has taken the leading position followed by Tamil Nadu and Gujarat over the period. Surprisingly, while Tamil Nadu has been able to improve itself to the second position in the growth rate of real per capita income over the period, Gujarat has kept her position more or less unabated in the three phases of our analysis.

Figure-1 : Scatter Plot of Growth Rates of Real PCNSDP During 1972-73 to 2009-10



On the whole, while we find some remarkable changes in the relative positions of some of the states in respect of growth, for the other states like Uttar Pradesh, Madhya Pradesh, Assam we find marginal changes in their relative positions for the three phases of our analysis of growth. Now it is quite likely that the changes in the rates of growth of the per capita real income over the three phases of our analysis will bring about changes in the magnitude, level, pattern as well as growth of consumption expenditure during the pre reform, post reform as well as for the overall period. So the question arises that whether the high growth states have experienced higher rate of decline in the incidence of poverty? The following scatter plot gives a clear overview about the relation between the growth and the percentage point decline in the incidence of poverty across the states. It follows that almost all the high growth states have been able to achieve higher rates of decline in the incidence of poverty over the period



4. Analysis of the Trend in Poverty

Now as far as the incidence of poverty is concerned it is well recognized that because of the growth mediated strategy of development and later the inclusion of the direct public intervention programmes of the Government the magnitude of the incidence of poverty has declined not only at the national level but also at the rural and urban areas across the states in varying degrees. However the dynamics behavior of the extent of poverty clearly reveals that the rate of decline was almost negligible up to 1970 because of the failure of the trickle down hypothesis so that about 51% of our total population lived below the official poverty line in the mid 70s. Later since mid 70s the extent of poverty started declining at a faster space both at the national level and cross-state level such that between 1977-78 and 1987-88 national level poverty declined to 39% and thereafter by 2009-10 it has reached the figure of 29.8%. It is worth mentioning that while analyzing the temporal behavior of the incidence of income poverty across the states we have used the planning commission estimates of poverty. Now since the Planning commission has changed the methodology of estimation of poverty for 2004-05 and 2009-10 by switching over from Lakdawala methodology to the Tendulkar methodology which covers broader perspective for measuring poverty, we have also used the same estimates for the periods 2004-05 and 2009-10 respectively. Obviously because of the change of methodology causing an upward shift in state specific poverty lines we find rather a mild increasing trend in the incidence of poverty across the states between 1999-2000 and 2004-05. This seems to have produced little impact on our panel regression analysis.

The time profile of the incidence of poverty across the states which are given in table-2 clearly reveals that almost all excepting Bihar experienced a declining trend in the incidence of poverty during 1973-74 to 1983-84 in varying degrees. Similarly the period from 1983-84 to 1993-94 also records a declining trend in the incidence of poverty for almost all the states excepting Harayana and H.P. Interestingly it discernable from the table-2 that almost all the states have experienced

declining trend in the incidence of poverty in varying degrees over the period from 1993-94 to 2009-10 i.e. during the post reform period. It is worth mentioning that since there is a switch over of methodology of estimation of poverty between 1999-2000 and 2004-05, we find relatively higher figures of head count poverty for almost all the states. However if we compare the figures of poverty estimated by using Lakdawala methodology for the same two periods then we find almost all the states excepting M.P., Maharashtra, Punjab, Rajasthan, and Orissa have experienced falling trend in poverty (Ghosal, 2010) It also interesting to note that in all the states excepting Assam the incidence poverty has fallen between 2004-05 and 2009-10, estimates for both years are based on Tendulkar methodology. It is also interesting to note that our calorie based estimate of poverty for 2009-10 reveals same declining trend in the poverty with a relatively lesser degree of incidence of poverty across the states as compared to the Tendulkar based estimates for the same period. Now to judge the relative positions of states in respect of their ability towards of poverty we have ranked all the states such that the state having the lowest incidence of poverty has got rank one and so on. It is obvious from table-2 that no state has been able to maintain constant rank. We find that the relative positions of the states in respect of their ability of reduction of poverty varies remarkably at the inter-temporal level over the period of our study.

Table-2 : Trend in Income Poverty (Head Count Ratio) Across the States

States	1973-1974	1977-1978	1983-1984	1987-1988	1993-1994	1999-2000	2004-2005*	2004-2005***	2009-2010**	2009-2010***
A.P	48.86 (6)	28.91 (4)	28 (4)	25.86 (4)	22.19 (2)	21.3 (7)	15.8	29.6 (6)	19.07	21.1 (6)
Assam	51.21 (7)	40.47 (9)	40.47 (9)	36.21 (8)	40.86 (12)	36.09 (13)	19.7	34.4 (11.5)	19.42	37.9 (15)
Bihar	61.91 (14)	62.22 (15)	62.22 (15)	52.13 (15)	54.96 (16)	41.5 (15)	41.4	54.4 (15)	23.5	53.5 (16)
Gujarat	48.15 (5)	32.79 (5)	32.79 (5)	31.54 (5)	24.21 (3)	16.2 (5)	16.8	31.6 (8)	27.11	23 (7)
Hariyana	35.36 (3)	21.37 (3)	21.37 (3)	16.64 (3)	25.05 (4)	11.1 (2)	14.0	24.6 (4)	22.44	20.1 (5)
H.P	26.39 (1)	16.4 (2)	16.4 (3)	15.45 (2)	28.44 (7)	11.7 (3)	10.0	22.9 (3)	22.98	9.5 (1)
Karnataka	54.47 (9)	38.24 (7)	38.24 (7)	37.53 (9)	33.16 (8)	25.6 (9)	25	33.3 (10)	22.16	23.6 (8)
Kerala	59.79 (12)	40.42 (8)	40.42 (8)	31.79 (6)	25.43 (5)	15.7 (4)	15	19.6 (1)	23.68	12 (2)
M.P	61.78 (13)	49.78 (12)	49.78 (12)	43.07 (12)	42.52 (14)	37.65 (14)	38.3	48.6 (14)	27.17	36.7 (12)

Maha- rashtra	53.24 (8)	43.44 (10)	43.44 (10)	40.41 (10)	36.86 (11)	28.65 (11)	30.7	30.2 (7)	22.18	24.5 (9)
Orissa	66.18 (16)	65.29 (16)	65.29 (16)	55.58 (16)	48.56 (15)	44.35 (16)	46.4	57.2 (16)	17.6	37 (9)
Punjab	28.15 (2)	16.18 (1)	16.18 (1)	13.2 (1)	11.77 (1)	6.15 (1)	8.4	20.9 (2)	17.6	15.9 (3)
Rajas- than	46.14 (4)	34.46 (6)	34.46 (6)	35.15 (7)	27.41 (6)	21.2 (6)	22.1	34.4 (11.5)	17.5	24.8 (10)
T.N	54.98 (10)	51.66 (13)	51.66 (13)	43.39 (13)	35.03 (9)	22.15 (8)	22.5	29.4 (5)	22.23	17.1 (4)
U.P	57.07 (11)	47.07 (11)	47.07 (11)	41.46 (11)	40.85 (12)	32.05 (12)	32.8	40.9 (13)	23.55	37.7 (14)
W.B	63.43 (15)	54.85 (14)	54.85 (14)	44.72 (14)	35.66 (10)	28.3 (10)	24.7	34.2 (9)	28.11	26.7 (11)
C.V.	24.195	28.699	37.027	35.542	32.706	43.306		43.31		43.82807

Source: Planning Commission 2002. Figs in brackets are Ranks. * Planning commission's estimates based on Lakdawala Methodology ** Author's Estimate based on Calorie consumption (2100 Kcal for Urban and 2400 K cal for Rural). *** Planning commission's estimates based on Tendulkar Methodology.

Now to judge the compatibility between the temporal behavior of quinquennial average growth rates, and the relative change in the incidence of poverty across the states we have computed the percentage point changes in the incidence of poverty across the states and time, the estimates of which are give in the table-3. It is evident from the table that during the periods between (i) 1973-74 and 1983-84; (ii) 1983-84 and 1993-94 and also between 1993-94 and 1999-00 all the states have experienced negative percentage point changes in the incidence of poverty in varying degrees. The phase wise analysis of the percentage point changes in the extent of poverty across the states reveals that over the period between 1973-74 and 1983-84 all the states excepting Bihar have experienced faster fall in the magnitude of poverty in varying degrees while in next phase (1983-84 to 1993-94) most of the states excepting Haryana, H.P and Assam have shown relatively smaller rate of decline in the extent of poverty with high degree of variability (see table 2 and 3). But in the third phase (1993-94 to 1999-2000) all the states are found to have experienced much faster fall in the extent of poverty. Further, during the 4th phase (i.e. between 1999-2000 and 2004-05) we find relatively smaller rates of decline in the magnitude of poverty in some of the states if the comparison is made between poverty figures based on Lakdawala method (not shown in the Table-3). However in such case a few states like Haryana, Maharashtra, Orissa, and Rajasthan are found to have experienced the increase in the extent of poverty in varying degrees. But if we consider the percentage point changes in the poverty across the states by comparing the poverty ratios for 2004-05 which is based on Tendulkar method with the poverty estimates of 1999-00 based on Lakdawala method as is shown in table 3 then we find that all the states excepting Assam have experienced

increase in poverty in varying degrees. Interestingly, in the 5th phase (i.e. 2004-05 to 2009-10) we find that all the states excepting Assam have experienced fall in the rate of poverty in different magnitude with H.P, T.N, Gujarat, Orissa, and Kerala showing much faster rates of fall in poverty. The table-2 confirms that the extent of poverty has declined in almost all the states in varying degrees since 1993-94. This is also confirmed by the study made by Himanshu (2007). However our analysis contradicts the major conclusion of Himanshu that poverty has reduced substantially between 1999-2000 and 2004-05, albeit he has drawn the conclusion by computing annual rates of changes in poverty. We also find the fall in the extent of poverty over the same period excepting for the states Rajasthan, Maharashtra, Orissa, Haryana and Punjab but with a relatively smaller magnitude in some of the states.

Table-3 : Rate of Change in Poverty since 1973-74

States	Percent point change in poverty in 1983-94 over 1973-74	Percent point change in poverty in 1993-94 over 1983-84	Percent point change in poverty in 1999-2000 over 1993-94	Percent point change in poverty in 2004-2005* over 1999-2000	Percent point change in poverty in 2009-2010* over 2004-2005*
Andhra Pradesh	-40.83	-23.24	-4.01	36.96	-28.72
Assam	-20.97	0.96	-11.67	-4.68	10.17
Bihar	0.50	-11.67	-24.49	31.08	-1.47
Gujarat	-31.90	-26.17	-33.08	95.06	-37.39
Haryana	-39.56	17.22	-55.68	121.62	-18.29
H.P.	-37.86	73.41	-58.86	95.73	-58.52
Karnataka	-29.80	-13.28	-22.80	30.87	-29.13
Kerala	-32.40	-37.09	-38.26	24.84	-38.77
M.P.	-19.42	-14.58	-11.45	29.08	-24.49
Maharashtra	-18.41	-15.15	-22.27	5.41	-18.87
Orissa	-1.34	-25.62	-8.67	28.97	-54.59
Punjab	-42.52	-27.26	-47.75	239.83	-23.92
Rajasthan	-25.31	-20.46	-22.66	62.26	-27.91
T.N.	-6.04	-32.19	-36.77	32.73	-41.83
U.P.	-17.52	-13.21	-21.54	27.61	-7.82
W.B.	-13.53	-34.99	-20.64	20.84	-21.93

Source : Author's Computation. * Figures of poverty are estimated by Tendulkar Methodology

Interestingly it also follows from table-2 & 3 that there has been high degree of variations in the incidence of poverty and its rates of decline both across states and time. The time profile of the C.V reveals a tremendous increasing trend in cross state variations in the incidence of poverty from 24.19% in 1973-4 to 43.31% in 2004-05 and further to 43.83% in 2009-10 albeit with a bit fluctuation between 1987 and 1994. This clearly indicates a divergent trend. However it is discernable from the table-3 that the time profile of the values of Gini inequality of each states does not reveal any uniform trend. On the whole we find that (i) Almost all the states have experienced increase in their growth rates coupled with some states experiencing increase in the degree of inequality and some experiencing falling inequality especially in the post reform period; (ii) all states achieving fall in the incidence of poverty with some achieving much faster fall and some very smaller rate of fall in the same. Further some states have experienced increasing inequality with lower growth rate and falling incidence of poverty.

Now if we look at the regional concentration of poverty and population across the states, the overview of which is given in table-5 then we find an interesting picture. It follows that in the states like Bihar, UP, the shares in the total poverty stricken people in India are much higher than their share in total population in 1999-2000 and 2009-10. For instance, while the share of UP in total population were 17% and 16.49% in 2001 and 2011 respectively, the relative share in total poverty stricken people in India were 20.36% and 20.80% respectively in the same period. Surprisingly, it is evident that when the share of UP in total population has fallen between 2001 and 2011 that in poverty has increased between the same period. It is further interesting to note that while the shares of the state Bihar in total population of the country have fallen from 10.69% in 2001 to 8.58% in 2011, the share in poverty has fallen marginally from 16.36% to 15.32% during the same period. The same trend is also found to persist for the states Maharashtra, West Bengal. However, the share of total poverty afflicted people in Orissa (4.32%) has been found to be much higher than in total population (3.46%) in 2011 the same picture is found to persist in 1999-2000 also. If we club the shares of the states like Bihar, MP, Maharashtra, Orissa, UP, West Bengal and Tamil Nadu in total poverty stricken and in total population in India then it is really surprising to note that while these states together account for only 53.96% of total population of India, their share in total poverty afflicted people of the country reads the figure of 62.24% in 2009-10. It is also evident that in all these seven states the shares of poverty stricken people were much larger (71.65%) than their share in total population (56.40%) in 2001. Now if we compare the growth performance of these states with their relative share in poverty then we really find a contrasting picture of high growth with higher concentration of poverty. So, once again we find a paradoxical relation between growth performance and regional concentration of poverty.

5. Analysis of Panel Regression Results

Now to find out the proximate explanatory factors responsible for the cross state and cross time variations in the incidence of poverty we undertake panel regression by using five yearly Panel data following the linear model as specified in section II. We use the software *LIMDEP 7.1*. Since our economy has experienced a policy evolution from growth mediated development strategy to growth

cum public action (workfare program) led development strategy even during the post reform period, to capture the impact of these policy variables on cross state and cross time incidence of poverty we have used social sector expenditure (SSE), growth rate of real per-capita NSDP (GRPCNSDP) as proximate explanatory factors in our panel. Further since inequality is likely to affect the incidence of poverty, we have also incorporated INQ as a possible explanatory factor.

Now, since in the pooled regression method the assumptions of constancy of intercepts and slope parameters across unit and time are unreasonable one has to allow the intercept term to vary over time and across units by using the fixed effect model (FEM). Since both the number of states (N) and the number of time periods (T) are small which are not drawn randomly in our case and further since it follows from the results that residual sum of squares fall substantially in FEM over pooled model the use the fixed effect model is likely to be desirable. The results of our panel regression analysis are given below.

Table-4 : Result of Panel Regression

Variable	Coefficient	P-Values
<i>SSE</i>	-1.418215793	0.0000
<i>GRPCNSDP</i>	-1.48983952	0.0000
<i>INQ</i>	-0.138727649	0.6602
R Squared	0.6809	
Adj. R Squared	0.628	
Model Test: $F[18,119] =$	12.93	0.0000
Diagnostic : Log- L=	-458.8088	

It follows that the three variables together explain about 63 percent of the cross-state and cross-time variations in the incidence of poverty over the period albeit the explanatory factor inequality is found to be statistically insignificant. The table indicates that the explanatory factors like SSE, GRPCNSDP are highly significant (as are indicated by their respective p-values) with their expected signs. Further the model test i.e. the F value and its probability and the log-likelihood ratio indicate that the regression result is robust. So from our panel regression analysis we can conclude that one percent point increase in social sector expenditure and growth rate of per-capita income has brought down the incidence of income poverty by 1.42 and 1.49 points across the states over the period of time.

6. Concluding Observations

The following conclusions emerge from our empirical analysis of growth and poverty. First, almost all the states in India have experienced increase in the rate of growth of per-capita real income across the three phases of our analysis in varying degrees. However the relative positions of the states as reflected in terms their respective ranks have changed across time. This seems to be due to the geographical as well as climatic divides and the differentials in the efficiencies of the provincial

Governments in implementing the various workfare programmes and also their governance. Second, almost all the states have experienced fall in the incidence of poverty albeit the rates of fall in poverty vary across the states. Further the rates of fall in the magnitude of poverty across the states have been found to be faster during the new millennium. Third, most of the high growth states have been found to have achieved higher rates of decline in poverty. It seems that the high growth states have been able to reap the benefits of market economy. Finally our panel results reveal that the social sector expenditure and the growth are the most significant correlates of cross state and cross time variations in the fall in the incidence of poverty. So the growth cum public action led development strategy is still relevant even in the age of globalization.

References :

- Ahluwalia, M.S. (2011). "Prospects and Policy Challenges in the Twelfth Plan", *Economic and Political Weekly (EPW)*, XLVI (21).
- Bhaduri, A. (2008). "Predatory Growth", *Lecture delivered at the Dept. of Economics*, March 28, University of Calcutta, Kolkata.
- Bhalla, S.S. (2005). "Recounting the Poor in Angus Deaton and Valerie Kozel (ed)": *The Great Indian Poverty Debate*, Macmillan India Ltd, New Delhi.
- Datt, G. (1999). "Has Poverty Declined Since Economic Reforms", *Economic And Political Weekly (EPW)*, 34(10).
- _____ and Martin R. (1998). "Farm Productivity and Rural Poverty in India", *Journal of Development Studies*, v-34, pp-62-85.
- _____ and Kozel and Ravallion, M. (2005). "A Model Based Assessment of India's Progress in Reducing Poverty in the 90's" in Angus Deaton and Valerie Kozel (ed)", *The Great Indian Poverty Debate*, Macmillan India Ltd, New Delhi.
- Gaiha, R. (1989). "On the Estimate of Rural Poverty in India-An Assessment", *Asian Survey*, 29(7).
- Ghosal, R.K. and Chattopadhyay, A. (2005). "Cross-State Differentials in Rural Poverty in India" in K, Nageswara Rao (ed), *Poverty in India*, Deep & Deep Publication Ltd, New Delhi.
- Ghosal, R.K (2005): "Globalisation And the Nation State", in Occasional Papers, 14, March, 2006, Rabindra Bharati University, Kolkata. Also in Open Eyes, 2(1&2), June-Dec.
- _____ (2005). "Globalisation and Inequality", *Indian Economic Journal*, 53(2), pp. 71-86.
- _____ (2007). "Augmented Solow Model of Growth and Its Empirical Relevance", *Journal of Quantitative Economics*, January, 5(1), pp. 85-100.
- _____ (2009). "Cross-Country Differentials in Economic Growth and Inequality in South Asia: A Panel Data approach", *Indian Economic Journal*, April -June, 57(1), pp 132-157.
- _____ (2010). "Inter-state Disparity in Growth, Poverty and Inequality in India—A Panel Data Approach", *Asian Economic Review*, August, 52(2).
- Himanshu (2007). "Recent Trend in Poverty and Inequality: Some Preliminary Results", *EPW*, Feb. 10.
- Jha, R. (2000). "Growth, Inequality and Poverty in India-Spatial and Temporal Characteristics", *EPW*, 36(3).
- Jones, R.P. and Sen, K. (2001). "On India's Poverty Puzzles and Statistics of Poverty", *EPW*, 36(3).

- Mehta, K.A. and Shah, A. (2003): "Chronic Poverty in India, Causes and Policies", *World Development*, 31(3).
- Meenakshi, J.V and Vishwanathan, B (2003). "Calorie Deprivation in Rural India, 1983-99/2000", *EPW*, 38(4).
- Radhakrishna, R. and Ray, S. (2005). "Poverty in India-Dimensions and Character", in Kirit Parikh and Radhakrishna (ed), *India Development Report, 2004-05*, IGRD, OUP, New Delhi.
- Rakshit, M. (2007). "Services-led Growth: Indian Experience" *Money and Finance*, February.
- (2009). *Macroeconomics of Post Reform India*, Oxford University Press, New Delhi.
- Sen, P. (2005). "Of Calories and Things", *EPW*, 40 (43).
- Saith, A. (2005). "Poverty Line Versus the Poor, Methods Versus Meaning", *EPW*, 40(43).
- Sen, A. (1996). "Economic Reforms, Employment and Poverty: Trends and Options", *EPW*, 37(3).
- (2000). "Estimates Of Consumer Expenditure and its Distribution: Statistical Priorities after NSS 55th Round", *EPW*, 35(51).
- Sengupta, A., Kannan, K. and Raveendran, G. (2008). "India's Common People: Who Are They, How many Are They and How Do They Live?", *EPW*, March, 49-63.