RESEARCH ARTICLE

INEQUALITY, POLARIZATION AND TREND OF CONVERGENCE IN ECONOMIC GROWTH IN INDIA

*Arpita Banerjee and Pravat Kumar Kuri

Department of Economics M.U.C Women's College, B.C. Road, Dist. Burdwan, West Bengal, Pin. 713104 India

ARTICLE INFO	ABSTRACT
	The persistence of regional disparity has been one of the major policy concerns of the Government of India since 80's. The accentuation of regional income inequality particularly during the period of liberalization and globalization raises question about the role of market controlled regime in bringing about equitable development all over the country. Still after twenty years of performance in neo-liberalised environment, the debate continues about whether excessive reliance on market creates development distortion by aggravating inequality further. Under this backdrop, this paper makes a renewed attempt to evaluate the growth performances and the trend & pattern of inequality in PCNSDP of India. The paper also examines the nature of convergence of PCNSDP of Indian states using panel data framework for nearly forty years period (1970-71 to 2009-10). The results reveal that Indian states have experienced with an unprecedented acceleration in growth rates along with sharp increase in inequality and polarization especially in the post reform period. The econometric analysis establishes the trends of absolute divergence but conditional convergence of PCNSDP for the period 1980-81 to 2007-08. The pattern of distribution of public and private investment is found to play the crucial role in bringing about inequitable development in India.

INTRODUCTION

The last quarter of the twentieth century has witnessed a growing concern towards providing explanations for uneven regional growth all over the world in general and India in particular. It was also widely recognized that economic development measured by means of per capita income growth cannot reflect the actual development of a country. India with the objective of balanced regional development started its planning period from 1951. With the initiation of economic reforms in the early 1990s in the line of full-fledged deregulation, liberalization and globalization, the role of government in investment decisions got diminished and private investment became the principal engine of growth. After the initiation of economic reform the whole economy has found a new groove. In the immediate aftermath of the 1991 reforms, growth did ratchet to an unprecedented streak of over seven percent for three successive years (1994-97), India has now been characterized as an emerging superpower in the world economy. But unfortunately inspite of this significant achievement India is still characterized by wide difference in economic, political, social and regional aspect. Jean Dreze and Amortyo Sen (1995) pointed out " Four decades of allegedly inventionist planning did little to make the country literate, provide a wide based health services, achieve comprehensive land reform or end the rampant social inequality that blight the material prospects of the underprivileged". Although independent India made significant progress during the second half of the 20th century, particularly in comparison with the colonial past but poverty and deprivation persist for at least $1/4^{th}$, possibly $1/3^{rd}$ of India's 1 billion people. In fact there are more poor people in India now than the population at the time of independence. (Kapila, 2010). India's economic policy was failed to transform its growth into development. The enormous regional differences have always attracted attention on Indian economists. In fact, there is a spurt of literature on the issues of regional convergence of economic growth in India with diverse findings. The study by Cashin and Sahay (1996),

Dholakia (1994), Bandyopadhyay (2003), Trivedi (2002) show absolute β convergence in per capita income of Indian states; whereas, the study by Marjit and Mitra (1996), Ghosh *et al.* (1998), Raman(1997), Dasgupta *et al.*(2000) show absolute divergence in per capita income of Indian states. On the other hand, the recent study by Nayar(2008), show absolute divergence but conditional convergence in terms of per capita income. The scholars like Mathur (1983), Rao (1973), Nair (1973), Sampath, (1977), Dreeze and Sen (1995), Kalirajan and Takahiro (2002) and Kalirajan *et al.* (1999) have also made profound contributions in this debate. Under this backdrop, this paper attempts to explore broadly two research questions: what is the nature of regional inequality in India? Are different states of India diverging from the steady state growth path? Analyzing the growth performance of Indian economy at the state-wise disaggregated level over the 40 years period from 1970-71 to 2009-2010, this paper examines the trends of disparity in per capita net state domestic product in order to understand the forces behind regional disparity in Indian economy. Attempts have also been made to examine the impact of economic reform on growth and inequalities in per capita net state domestic product. Finally, the paper makes the test of convergence to explain the regional disparity in Indian economy. For convenience, this study is divided into four sections. Section 2 deals with data sources and methodology used in this study. Section 3 discusses the results obtained in this study in respect of growth rates, inequality and polarization measures of PCNSDP of Indian states and the convergence results obtained in this study. Section 4 presents the concluding remarks.

Data and methods

Data Source

This study is based on the time series data on PCNSDP for the period (1970-71to 2009-10) which was collected from 'Domestic Product of states in India 1960-61 to 2006-07',EPW Research foundation(2009) and from the Planning Commission, Government of India. This study

Corresponding author: econarpita@rediffmail.com

covers 20 major states of India. The data for per capita capital expenditure during 1980-81 to 2009-10 has been collected from "Handbook of statistics on State Government Finance" by RBI, 2010 The statistics for private investment ie loans extended by AIFI has been taken from various issues of the "The IDBI Report on Development Banking" in India. The statistics for socio economic indicators of different states for Urban Amenity Index has been collected from National Human Development Report, 2001, various issues of Censuses and Fact sheets of NFHS-III. The data for IMR has been collected from various issues of census and Sample Registration System. Similarly the data for literacy rates statistics are compiled from various issues of censuses.

METHODOLOGY

The paper estimates compound rate of growth of PCNSDP over the period of the study for different states in India. Some statistical measures like Coefficient of variation, Gini coefficient, and theil index have been used to examine the trend of inequalities in development performance. To examine polarization in per capita NSDP in Indian states the measure of polarization proposed by Esteban and Roy (1994) has been estimated for the states for the specified period. Moreover, the issue of regional disparity in growth performance has been analyzed through the tests of convergence: test of σ convergence and the test of absolute and conditional β-convergence. σ convergence is measured using the standard deviation of logarithm of per capita income, it occurs when the cross sectional dispersion decreases overtime, while β-convergence occurs when initially poor regions grow faster than their rich counterparts. Considering the difficulty faced in the testing of absolute and conditional β-convergence by OLS method, this study examines the β convergence testing of PCNSDP in dynamic panel data framework using the fixed effect method and Generalized Method of Moments estimation technique.

RESULT AND DISCUSSIONS

Growth performance of Indian states

Analyzing the compound growth rate of PCNSDP over 40 years period it is pertinent to say that overall growth in per capita net state domestic product has been found quite satisfactory in India particularly in recent years.

For the overall period (1970-71 to 2009-2010) the Compound growth rates of States in India reveal that the states like Goa achieved the highest growth rate of 4.98% per annum followed by Karnataka (4.74%) and Arunachal Pradesh (4.18%) (see (Table 1)). The lowest growth was registered by the state Assam with 1.44% growth rate, succeeded by Madhya Pradesh (1.46%), J&K (1.73%), Uttar Pradesh (1.85%) and Bihar (2.08%). Economic reform is observed to have significant impact on economic growth. The segregation of whole period into pre-and post liberalization period reveal that in the pre reform period (1970-71 to1991-92) the compound growth rates of most of the states were much lower compared to the post liberation period (1991-92 to 2009-10) (see Table 1 and Figure 1).
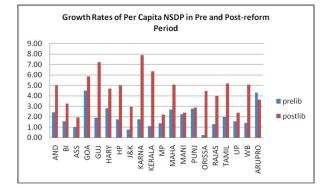

Figure 1. Growth Rates of Per Capita NSDP in Pre and Post-reform Period

In the pre-liberalization period some of the states grew at the rate of even less than 1% per annum (e.g. Orissa, J&K, Assam). The five fastest growing states in 1st sub-period ie in the pre-liberalisation period were Goa, Arunachal Pradesh, Haryana, Punjab and Maharashtra while Orissa, J&K, Assam, Kerala and Rajasthan were the five states with lowest growth rate in the same period. In the post reform period the growth of PCNSDP of all the states accelerated at a high rate. Highest growth was achieved by Karnataka with a growth rate of 7.92% per annum and the next two were Gujarat and Kerala. In this period Punjab and Haryana experienced a deceleration in their growth rate and were replaced by Karnataka and Kerala in the category of five fastest growing states.

Table 1. Compound growth rate of PCNSDP during 1970-71 to 2009-10, pre liberalisation (1970-71 to 1991-92) post liberalization (1991-92 to 2009-10) and for the period(1970-71), (1980-81), (1990-91)and (2009-10)

States	Whole period	Pre-liberalisation		Post-liberalisation		Decadal growth rates			
	(1970-2010)	(1970-1992)	Rank	(1992-2010)	Rank	(1970-71)	(1980-81)	(1990-91)	(2009-10)
Andhrapradesh	3.64	2.42	6	5.03	8	1.03	4.09	3.80	5.70
Bihar	2.08	1.55	12.5	3.24	14	0.56	2.70	-0.85	6.01
Assam	1.44	0.99	18	1.93	20	0.22	1.86	0.89	2.82
Goa	4.98	4.50	1	5.88	4	4.98	4.50	5.63	4.82
Gujarat	3.97	1.90	9	7.21	2	0.87	3.13	3.97	8.85
Haryana	3.59	2.80	3	4.68	10	1.89	4.00	2.57	5.93
Himachalpradesh	3.13	1.74	10.5	4.98	9	0.89	2.78	3.69	5.22
Jammu&Kashmir	1.73	0.77	19	2.94	15	1.58	0.04	1.80	3.52
Karnataka	4.74	1.74	10.5	7.92	1	0.70	2.98	6.03	9.46
Kerala	3.45	1.10	17	6.37	3	0.45	1.87	4.49	7.14
Madhyapradesh	1.46	1.37	15	2.18	19	0.64	2.25	1.27	1.70
Maharashtra	3.65	2.69	5	5.08	6	2.03	3.64	4.10	4.86
Manipur	2.40	2.23	7	2.39	17	2.64	2.05	3.96	0.98
Punjab	2.81	2.74	4	2.87	16	2.38	3.38	2.72	2.75
Orissa	2.39	0.23	20	4.46	11	-0.02	0.51	1.90	7.46
Rajasthan	2.22	1.28	16	3.99	12	-1.94	4.74	1.62	4.07
Tamilnadu	3.41	1.95	8	5.18	5	0.05	4.09	4.98	4.43
Uttarpradesh	1.85	1.55	12.5	2.37	18	0.66	2.60	1.18	3.01
West Bengal	3.16	1.39	14	5.07	7	0.99	1.92	5.02	4.97
Arunachal Pradesh	4.18	4.30	2	3.64	13	3.45	5.60	2.70	4.90

Source: Author's calculation based on PCNSDP over 1970-71 to 2009-10 Note: Due to non-availability of data for some states like Arunachal Pradesh, Goa, Gujrat, Himachal Pradesh, J&K, Kerala, MP, Maharashtra in 2009-10 one projected figure for PCNSDP have been used.

It is interesting to note that the Punjab being in the five fastest growing states in the pre reform period slipped to the category of five lowest growth states during this period, whereas the reverse happens in case of Kerala. The states like Assam, Madhya Pradesh, Uttar Pradesh maintained the same status of low growth states in this period whereas J&K and Rajasthan managed to come out from the status of five low growth states of the previous decade and were replaced by Punjab and Manipur. The states like Andhra Pradesh, West Bengal, Himachal Pradesh, Orissa, Rajasthan, Bihar made a good recovery during liberalization period. To get a detail idea about the performance of the states decadal growth rates have been computed. From the decadal growth rate depicted in Table 1 it is revealed that during 1970-71, most of the states registered lower growth rate except the states Goa and Arunachal Pradesh. On the other hand during 80's performance of most of the states improved to a large extent. The states like Andhra Pradesh, Bihar, Assam, Gujarat, Haryana, Himachal Pradesh, Karnataka, Kerala, Madhya Pradesh, Rajasthan, Tamil Nadu, Uttar Pradesh, West Bengal and Arunachal Pradesh made an impressive improvement in their growth rate in this decade compared to that of 1970-71. However, during 90's, the picture is mixed. Some states improved significantly while some faced deterioration. The growth rate of Bihar, Assam, Haryana and Arunachal Pradesh deteriorated to a large extent. Bihar experienced a negative growth of PCNSDP. In contrast, Kerala which was a low growth state in 1970-71 made a consistent improvement in the last two decade. Other than that, Gujarat, Himachal Pradesh, Jammu & Kashmir, Karnataka and Maharashtra also improved consistently throughout the decades. Again it has been observed that some middle income states like Andhra Pradesh, Himachal Pradesh, Karnataka, Tamil Nadu and West Bengal performed better in this decade. In the last decade 2009-10 except Goa, Manipur, Uttar Pradesh and West Bengal all the remaining states were able to achieve a higher growth rate compared to the previous period. In this year Karnataka achieved the highest growth rate of 9.46%. Surprisingly, the low growth states like Orissa and Bihar made a remarkable recovery during this decade by recording a growth rate of 7.46% and 6.01% respectively and moved at a faster rate to be in line with Karnataka, Gujarat and Kerala- the highest growing states in the recent decade. Jammu & Kashmir and Rajasthan also made a substantial improvement to get rid of the level of low growth states. But Madhya Pradesh and Assam still maintained the image of the lowest growing states. The growth rates of Manipur and Punjab also dropped significantly in the last decade.

Trends in inequality in PCNSDP across the States in India

The extent of inequality in PCNSDP is a straightforward measure of regional inequality. In order to measure the extent of disparities in PCNSDP across the referred states during the period (1970-71 to 2009-10) coefficient of variation, gini coefficient[i] and Theil Index are computed for both year and decade wise and for the whole period (1970-71to 2009-10) for 20 states at 1993-94 constant prices. Results of gini coefficient (see Table 2, Figure 3) indicate an increasing trend of inequality till 1997-98. After that, it maintains a stable position till the year 2007-08, followed by a slightly increasing trend in the remaining time period. On the other hand, Coefficient of variation shows a sharp increasing trend till 2001-02; beyond which it maintains a constant level till 2006-2007. However, in 2007-08 it slightly declines and then again it shows a rising trend in 2009-10. (see Figure 2)

Table 2. Gini Coefficient and Coefficient of variation in PCNSDP of 20 Indian states during 1970-2010

Year	Gini Coefficient	Coefficient of variation
1970-71	0.130	22.819
1980-81	0.160	30.073
1990-91	0.190	36.330
2000-01	0.240	46.720
2005-06	0.240	56.861
2007-08	0.243	46.719
2009-10	0.267	49.885

Source: Author's calculation based on PCNSDP over 1970-71 to 2009-10
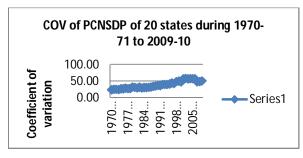

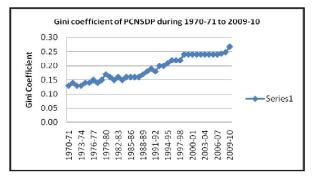**Figure 2. COV of PCNSDP of 20 states during 1970-71 to 2009-10**

Figure 3. Gini coefficient of PCNSDP during 1970-71 to 2009-10

The result of Theil's Index also conforms to the result of the above inequality measures (see Table 3). Theil's index of PCNSDP (global index T comprises of T_b and T_w) over the years records increasing inequality among the states. Decomposed index shows that interregional inequality accounted for the major proportion of global inequality. Though both parts- interregional and intra-regional inequality have increased, the gap between two inequalities were larger upto 1990-91 but after that intra-regional inequality experienced high level of heterogeneity.

Table 3. Result of Theil Index of PCNSDP during 1970-71 to 2009-10

	Tb(between)	Tw(within)	T(Tb+Tw)
1970-71	2.55	0.03	2.58
1975-76	2.55	0.04	2.59
1980-81	2.54	0.03	2.58
1985-86	2.53	0.01	2.54
1990-91	2.53	0.07	2.60
1995-96	2.51	0.11	2.62
2000-01	2.50	0.12	2.61
2005-06	2.48	0.24	2.73
2009-10	2.43	0.35	2.78

Source: Author's calculation

Trends of polarisation in PCNSDP

The measure of polarization is conceptually different from the measure of inequality. The phenomenon like "disappearing middle class" and "clustering around extremes " cannot be easily captured by the standard measures of inequality. In order to test whether the Indian states are polarized in terms of PCNSDP, a measure proposed by Esteban and Roy (1994) have been computed for the period 1970-73, 1990-93, 2000-03 and 2007-10 respectively.

Table 4. Measure of Polarisation

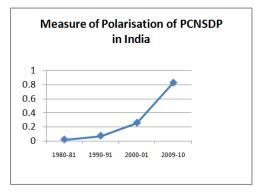| YEAR	ER
1980-81	0.021
1990-91	0.074
2000-01	0.26
2009-10	0.83

Source: Author's calculation

Figure 4. Measure of Polarisation of PCNSDP in India

The result indicates a sharp accelerating trend in polarization, particularly from the period 2000-01.

Regional Convergence of PCNSDP in India

The convergence hypothesis states that regions tend to gravitate towards their steady state level of growth, overtime. This tendency to converge is higher in states that are farther away from the steady state value. Steady state can be defined as an average growth rate of the regions for a chosen time period. Barrow and Sala-i-Martin distinguish between two types of convergence-σ convergence and β convergence. σ convergence occurs when the cross sectional dispersion decreases overtime. σ convergence is measured using the standard deviation of logarithm of per capita income and β-convergence occurs when initially poor regions grow faster than their rich counterparts. This type of convergence implies that the poor regions would catch up the rich regions. In our analysis to examine σ convergence the standard deviation of logarithm of per capita NSDP is computed for the period 1970-71 to 2009-10 for 20 states (see Table 5). Figure 5 depicts the trend on tests of sigma convergence. From figure 5 it is observed that the dispersion of PCNSDP started increasing at a moderate rate from 1988-89 and accelerated at a faster rate from 1991-92 continuing till 2000-01beyond which it maintained a stable trend till 2007-08. In 2009-10 it again showed a rising trend. Thus, the result of sigma coefficient indicates an accentuation of regional disparities in the post reform period for a considerable period of time after which it remained stable.

Table 5. Result of sigma convergence in PCNSDP during 1970-71 to 2009-10 in India

Year	Value
1970-71	0.251
1980-81	0.291
1990-91	0.339
2000-01	0.457
2005-06	0.511
2006-07	0.522
2007-08	0.468
2008-09	0.467
2009-10	0.504

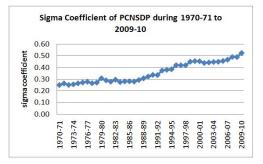Source: Author's calculation based on PCNSDP over 1970-71 to2009-10

Figure 5. Sigma Coefficient of PCNSDP during 1970-71 to 2009-10

Finally, the analysis of regional inequality has been examined using the test of absolute β convergence. The existence of absolute β convergence is empirically examined by estimating cross sectional regression of annual average growth rates of PCNSDP on the initial level of PCNSDP. The following equation is estimated for testing absolute β convergence. $[In\ (Yi,t)-In(Yi,t-\tau)]/\tau=\alpha+\beta In(Yi,t-\tau)+\varepsilon i,t$ where L.H.S represents the ith region's average growth rate of per capita income between the period t and t-τ, and In(Yi,t) and In(Yi,t-τ) are the natural logarithms of the ith region's per capita NSDP at time t and t-τ respectively. τ= the length of the time period. If the regression coefficient on initial level of per capita income bears a statistically significant negative sign, ie, if β<0 then we say that there exists absolute β convergence. The negative coefficient on initial level of per capita income signifies that the regions with lower initial level of per capita income would grow faster than the regions with higher initial per capita income. In our analysis five sets of regression have been estimated. One is for the whole period (1970-71 to 2009-10) , next two are for the pre and post reform period (1970-71 to 1991-92) and (1992-93 to 2009-10) and the last two regressions are run to know whether there is any marked difference in convergence pattern between first and second phase of post-reform period. The results show positive β coefficients for all periods except the pre-reform period (see Table 6). The results of β coefficients imply that there is a significant impact of New Economic Policy on the states of Indian economy. The change in the policy focus of the Indian government after the New Economic Policy may be responsible for rising uneven development in terms of PCNSDP among the states. However, over the three periods the R^2 values are not significant and also the βcoefficients are not found statistically significant.

Table 6. Regression Results of absolute β convergence of PCNSDP in India

Period	significance	β coefficients	t value	R^2
1970-2010	.690	.157	.406	.033
1970-1992	.855	-.4.11E^{-02}	-.186	.002
1992-2010	.469	.164	.740	.030
1991-2000	.804	.0003	.252	.004
2000-2010	.019	.0006	.564	.019

Source: Author's calculation based on PCNSDP over 1970-71 to 2009-10

Using of OLS method in the estimation of β convergence suffers from some drawbacks like omitted variable bias leading to inconsistent estimate. The use of panel data specification has several advantages over cross section specification (Islam, 1995). Panel data specification provides for large number of observations allowing for more degrees of freedom, reduce collinearity among independent variables and increased probability of getting more reliable estimates (Woodbridge, 2002). Moreover, in the panel data specification, the region specific time invariant effect can be controlled. Considering the problems observed in the estimation by OLS method, the absolute β convergence has again be tested in a panel data framework for the period 1980-81 to 2007-08, using fixed effect method. We have used panel of four years. With 7 panels the total number of observation is 119. The results (see Table 7) imply absolute β divergence as the coefficient of β is positive (.111) and highly significant.

Table 7. Fixed Effect Method Estimation Result for Absolute β convergence

Dependent Variable: PCNSDP			
Explanatory variable	Coefficient	Std. Error	t-Statistic	Prob.
PCNSDP(-1)	1.117331	0.033645	33.20895	0
C	-0.89757	0.300346	-2.988458	0.0037

Source: Author's calculation

Conditional convergence

The strict absolute divergence in PCNSDP across states have forced to go for testing of conditional convergence of PCNSDP for the period 1980-81 to 2007-08. For testing conditional convergence of PCNSDP as done in several pioneering studies, the choice of explanatory variables is very important. The variables that are used as proxy for

saving, capital stock and technology should accurately control for the difference in the steady states across the states. In this study, the chosen explanatory variables are Per capita capital expenditure (PCCE) used as proxy for public investment, Per capita loans sanctioned (PCLS) by AIFI used as proxy for private investment, Urban Amenity index (UAI)[1], Percentage share of PCNSDP in primary sector (PRIS), Literacy rate (LR) and Infant Mortality Rate (IMR). For examining conditional convergence we have used the dynamic panel data framework. A panel of four years has been taken for the overall period 1980-81 to 2007-08. Due to non-availability of some data for some states for particular period this study is restricted to 15 states. Seven panels have been formed and the total number of observation becomes 105. We have applied here both fixed effect method and the Generalized Method of Moments estimation technique for this analysis in dynamic panel data framework. This would enable us to make differentiation between the results of the two methods and also to get an accurate result. The regression equations that have been fitted for two methods are given below.

1. For fixed effect estimation the equation used is

$Log(y_{it}) = (1+ \beta)log(y_{it-\tau}) + \psi X_{it} + \eta_i + \mu_t + \varepsilon_{it}$ (Islam,1995) Where y denotes real per capita income, i indexes the state, t indexes the time period, τ denotes the number of years between each successive observation, η is a state specific fixed effect and μ is the year specific effect, X is a vector of explanatory variable.

2. For GMM estimation the equation fitted is

$\Delta Log (y_{it}) = (1+ \beta) \Delta log(y_{it-4}) + \psi\Delta X_{it} + \Delta\mu_t + \varepsilon_{it} - \varepsilon_{it-4}$ Here the Generalized Method of Moments (GMM)[2] estimation technique has been used as the GMM estimation technique overcomes the twin problems of correlation between the explanatory variable and problem of endogeneity. The results of conditional convergence obtained from the two methods are portrayed in Table8 and Table 9. Both the results imply conditional convergence of PCNSDP as the coefficients of lagged PCNSDP ie $(1+\beta)$ are 0.68 and 0.87 respectively in fixed effect method and GMM estimation technique. Therefore the coefficient of β becomes -0.32 and -0.13 with 1% significance level in two methods. The results show that the coefficient of Per capita capital expenditure (PCCE) and Per capita loans sanctioned (PCLS) are positive and statistically significant. It indicates that these two have a dominant role in making per capita SDP divergent. Whereas the effect of UAI is also positive and that of IMR is negative in both the two methods which is an expected outcome. The effect of literacy rate is insignificant, may be attributable to the problem of multicollenearity bearing a strong correlation between IMR and Literacy rate. Moreover the effect of the share of the primary sector is though positive but insignificant.

Possible reasons for divergence

The above analysis makes it very clear that the crucial determinants of divergence in PCNSDP across states are public investment and private investment. Our result is consistent with the study of Nayyar (2008) and Kalirajan *et al.* (1999). Since the development of industrial infrastructure and urban amenity are mostly the responsibility of state government, public investment is considered to be the key variable determining better industrial infrastructure and improved urban amenities.

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[1] For constructing Urban Amenity Index, five development indicators have been selected. They are percentage of urban population in a particular state, percentage of urban household getting safe drinking water, percentage of urban household having electricity connection, percentage of urban household getting toilet facility, percentage of urban household having pucca houses. The in sex has been constructed using deprivation method with the help of PCA.

[2] The method of GMM is to first difference the basic growth equation to eliminate the fixed regional effects and then use instrumental variables estimation to address the correlation between the differenced lagged dependent variable and the induced first order moving average error term. Arelleno and Bond(1991) developed the GMM approach to estimate dynamic panel data models. Arelleno and Bond suggested for using lagged levels of the series as instruments for lagged difference.

Table 8. Fixed Effect Estimation Result for Conditional β convergence

Explanatory variable	Coefficient	t-Statistic	Prob.
C	3.456402	2.798604	0.0067
PCNSDP(-1)	0.682325	5.583362	0
PCCE	0.170053	2.495197	0.015
PCLS	0.36452	2.282321	0.03
UAI	0.120001	0.576227	0.5664
IMR	-0.06238	-1.21783	0.2275
LIT	-0.13339	-0.67841	0.4998
PRIS	0.009056	2.37116	0.0206

Source: Author's calculation

Table 9. GMM Estimation Result for Conditional β convergence

Explanatory variable	Coefficient	t-Statistic	Prob.
PCNSDP(-1)	0.877106	5.787895	0
PCCE	0.1627	3.360935	0.0013
PCLS	0.34694	2.172423	0.0333
UAI	0.152187	0.560881	0.5767
IMR	-0.16954	-0.71544	0.4768
LIT	-0.15026	-0.61336	0.5417
PRIS	0.001037	0.15651	0.8761

Source: Author's calculation

A simple regression analysis taking per capita capital expenditure as proxy for public investment and PCNSDP as the explanatory variable shows that there is a significant positive association between the two. Thus the higher the income of a state, the greater is the flow of public investment. In other words, it implies that public investment is flowing disproportionately in favour of richer states and making the development divergent (see Table 10).

Table 10. Effect of Government Capital Expenditure on PCNSDP

Dependent	variable	PCCE	
Variable	Coefficient	t-Statistic	Prob.
C	-7.98182	-1.80394	0.0743
PCNSDP	0.996366	2.147536	0.0342

Source: Author's calculation

Further, in order to infer about the distribution of private investment to the states, the variable per capita loans sanctioned (PCLS) to the states has been regressed on PCNSDP. The regression result between PCLS and PCNSDP (see Table 11) shows a significant positive relationship implying that the richer states have greater access to private investment.

Table 11. Effect of Private Expenditure on Government investment

Dependent variable		PCLS	
Variable	Coefficient	t-Statistic	Prob.
C	0.337503	0.057533	0.9543
PCNSDP	0.714919	1.395314	0.1665

Source: Author's calculation

It is natural that private investment essentially flows to the states where expectation of return is high. The developed states provide conducive environment (in terms of infrastructure, governance, skill, knowledge) for making private investment. Interestingly, more public investment makes the region more developed and this, in turn, attract more private investment. Another exercise of regression of PCLS on PCCE in fixed effect framework reveals a positive and significant relation between them (see Table 12).

Table 12. Effect of Private Expenditure on Government investment

Dependent variable		PCLS	
Variable	Coefficient	t-Statistic	Prob.
C	2.344475	4.141877	0.0001
PCCE	0.636971	6.182124	0

Source: Author's calculation

This result establishes that higher amount of public investment in a region definitely attracts larger amount of private investment in the

same region. The complementary roles of the two help in developing social and physical infrastructure in a particular region. Thus the uneven distribution of both public and private investment generates the uneven development of infrastructure, human capital as well as urbanization. The concentration of public and private investment in the richer states makes the lagging states further worse off pulling them far behind, which, in turn, strengthen the inequality further. Finally, it is well known that one of the major determinants of public investment in a state is the grants and loans provided by the central government. In this study the variable per capita for grants and loans of states has been regressed on Per Capita NSDP the period 1980-81 to 2009-10 to infer about whether any redistributive role has been played by the central government in the allocation of grants and loans to the states.

Table 13. Effect of per capita Grants and Loans by the central govt on PCNSDP of states

Dependent variable	PCGANDL		
Explanatory variable	Coefficient	t-Statistic	Prob.
C	-7.19663	-7.47634	0
PCNSDP	1.601121	15.00195	0

Source: Author's calculation

The regression result (see table 13) reveals a surprising fact. It shows a positive and significant relation between 'per capita grants and loans' (PCGANDL) and PCNSDP. It signifies that higher grants and loans are flowed to the higher income states in the country. In spite of several initiatives and policy measures taken by the central government for equitable distribution of its resources, still there is an indication of skewed distribution of resources in favour of richer states in India. The richer states with higher tax raising capacity coupled with higher contribution from the central government are able to develop better socio-economic infrastructures which attracts private investment and thus makes the development inequitable in India.

Concluding remark

This paper represents the analysis of the pattern of disparities in growth performance across 20 states of India over the period 1970-71 to 2009-10. To assess the state level disparities some basic measures of inequality has been used. The growth rates of pre and post liberalization period imply that Indian states experienced a marked improvement in growth performance in the neoliberal regime. But the measures of inequality entail a disperse picture or accentuation of regional inequality in the same period. Moreover, the measure of polarization signals an alarming sign of acceleration indicating a serious concern for policy makers. Thus, Government policy prescription of balanced regional development failed to bring about equitable development across the states in India during the time span and interestingly the gap widens especially in the post reform period. Despite this, the brighter side remains in the achievement of higher growth rate in PCNSDP by the state Bihar, Orissa, Rajasthan and Jammu & Kashmir. These states made their strides in improving their per capita NSDP growth in recent years. Interestingly the southern states like Karnataka, Kerala, Tamil Nadu made a considerable improvement in growth rates over the period of economic liberalization and steadily improved upon their positions compared to the pre-liberalisatin period. The results of σ and absolute β convergence show a sharp divergence in SDP across states both in the cross section and time series (panel data) framework. But the testing of conditional convergence of per capita NSDP in dynamic panel data framework reveals a robust result of convergence implying the states are converging to the divergent steady states. The variables like public investment, private investment, industrial infrastructure and urbanization are found to play a crucial role in making development inequitable in India. It is observed that the distribution of public investment is the key variable explaining the divergence in per capita economic growth. The pattern of distribution of private investment is observed to be guided by the distribution of public investment in

favour of better off states. Therefore, the possible policy suggestions would be more and more targeted public investment in remote and poorer zone for the development of physical and social infrastructure so as to attract more and more private investment for bringing about inclusive development for the country.

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