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Regional Analysis: An essay in honour of
Prof. Ashok Mathur**

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India's Development Experience - A Regional Analysis

An essay in honour of Prof. Ashok Mathur

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Abstract

Wide regional variation has been a major characteristic of development experience in India. In the present study, the multidimensional facet of development is sought to be reflected through composite indices of development. It deals with the development trends exhibited at the National as well as Regional level during the period 1971-1995 with special focus on regional disparity in development levels. Considerable variation in the levels of development - both across states and also within each state is perceived. The disparity seems to be widening over time, specially in the post-reform period. Providing adequate infrastructural facilities, shift from Central Planning to Multilevel Planning, and breaking the myth of trade-off between growth and equity are some of the emerging policy suggestions.

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Introduction

Wide regional variation has been one of the major characteristics of the development process experienced by India. This has also been a source of rising discontent among regional blocs - which has often taken the form of social unrest, civic disorder, and fumed by political agitation, secessionist tendencies in some extreme cases. Whereas achievement of regional equality has been one of the main objective of our planning process, how far that has been successful needs to be studied carefully.

Various studies have tried to trace the path of development in India with a special focus on its regional pattern. Most of them have used 'States' as the unit of region and studied cross-sectional disparity in development over a few time-points to map the long term trend in it. The results obtained and the conclusions arrived at varies from one extreme to another.

Williamson (1965, 1968) did the pioneering work in this regard as a part of his international study and concluded that regional inequalities in India increased during the 1950s. This conclusion was refuted first by Dhar and Sastry (1969), and then by Mahajan (1982). Others claiming a narrowing down of regional disparity have been Gupta (1973), Lahiri (1969), and Rao (1972) . Broadly parallel results have been reported by Majumdar (1970), Nair (1982), Ganguli and Gupta (1976), and Mathur (1983, 1987). As against this school, there have been studies that either claim a rise in regional inequality or do not find any evidence to reveal significant narrowing down of the gap. Venkataramiah (1969), Rao (1973), Nair (1973), Chaudhry (1974), Sampath(1977) and Mohapatra (1978) belong to this group who argue that regional imbalances in India have increased over the years. Such disagreement has been mainly due to the short span of these studies, and the sensitivity of the conclusion towards choice of initial and terminal years. Perhaps, the most comprehensive and extensive work has been that of Prof. Ashok Mathur, to whom this volume is dedicated. In his article of 2000, he has covered, in one long sweep, the issues of

National and Regional Growth experiences in India from 1950-51 to 1996-97, and in some cases up to 2000. The paper also looks into growth at the Sub-sectoral level and tries to find out which sector has been the 'Engine of Growth' in India. As a result, he had been able to bring out the different trends exhibited by the three subsectors regarding regional disparity in growth, as also the diverse trends perceived in the four decades.

However, these studies, including that of Mathur mentioned above, have mostly used aggregate regional income (or consumption) levels as indicator of development level, and its improvement as indicator of Growth. In most cases Net State Domestic Product has been used. This means that development has been conceptualised as a uni-dimensional factor, captured by income, domestic product, or consumption level alone. While it can not be denied that these measures are most widely used, understood and recognised indicators of the success of an economy, they are by no means exhaustive. So, in the present study, a diversified view of development is taken where the multidimensional facet of development is sought to be adequately reflected. It was accepted that a region cannot be so easily termed economically underdeveloped only on the basis of its production, income and consumption levels. There are various facets of economic development and a region, while lacking in one, may be well developed in another. Consequently Development was thought to be consisting of three constituent components of:-

- I. Agricultural Development - related mainly to the Agricultural sector;
- II. Industrial Development - related mainly to the Manufacturing sector; and
- III. Human Development - related to the Social Indicators of literacy, mortality, school enrolment etc., and Per Capita Income

Each of these components of development themselves consist of several variables/indicators¹. Separate indices for each of the three components of development are prepared (by method explained later) and future analysis is based on those indices.

The paper is divided into four sections. In the next section we discuss the methodology used for the study. The second section deals with the development trends exhibited at the National as well as Regional level during the period 1971-1995. The third

section analyses those trends in light of regional disparity in development levels. A short summary as well as Policy suggestions is provided in the last section.

Methodology

Any study that attempts to study such a broad aspect of socio-economic development, over so vast a space as of India must be careful about, and give serious thoughts to, two very important aspects. They are:-

- (a) Choice of variables or indicators, and,
- (b) The method of compositing them into indices.

Both of them must be discussed.

An indicator is included on the side of development proper if it is measuring any of the end results of development process, namely - income generation, capital formation, sectoral transition or human capital enhancement. This type of classification has been done with the a-priori ideological standpoint that development is the outcome of a complex process of social, economic, geographic and administrative interactions. This somewhat resolves the issue of choice of indicators and their sub-grouping under different components of Development.

The second major methodological issue to be discussed is the method of combining the indicators to arrive at composite score. Since this study aims to look at a broad spectrum - not only temporally or spatially, but also in terms of its span and coverage of the aspects of development, relatively large numbers of indicators (or variables) are used. To give due importance and precedence to economic logic, variables were grouped a-priori on the basis of which aspect of development they are representing. Correlation Matrix of in-group variables is looked into only to confirm whether all the coefficients are positive or not. Any variable having negative correlation with others would signify that the variable is moving in a direction opposite to the others, and hence should not be included in that group. Such a variable would then be investigated further. After grouping the variables under the three sub-components already discussed, effort was made to construct composite indices - each index representing one particular aspect of development. Thus the objective

was to prepare composite indices of Agricultural Development (AGDEV), Industrial Development (INDDEV) and Human Development (HUDEV) for the states of India, as well as the National level for each of the 25 years. This was done using Factor Analysis. Factor Analysis tries to find out the fundamental, or latent, 'Factor' within each cluster or group. Thus each group would be composited into a 'factor' by linear combination of the variables of that group. This factor captures the essence or profile of that particular group and can then be used as a new variable representing a particular set of variables, or, in broader terms, a particular aspect of the data. Even under Factor Analysis there are various methods², namely - a) The Centroid Method, b) The Principal Component Method, and c) The Maximum Likelihood Method.

The Centroid Method, popular in the first half of the twentieth century, maximizes the sum of loadings or weights that a factor attaches to individual variables, disregarding signs. Though the operation is simple, this method fell out of favour of researchers due to its low explanatory power compared to the other two methods.

The Maximum Likelihood Method consists of obtaining a set of Factor Loadings such that each factor explains maximum possible of the Population Correlation Matrix as estimated from the Sample Correlation Matrix. Though this method tries to maximize the 'relationship' between sample of data and population, it involves relatively difficult arithmetic, higher algebra & matrix algebra, adequate calculus and iterations. Thus it is practically very seldom used by researchers.

The most commonly and frequently used method of Factor Analysis nowadays is the Principal Component (PC) Method.³ In the PC Method the Sum of Squared Loadings of each factor is sought to be maximized. So the factor obtained from the PC Method explains the maximum possible variance in the data matrix. However, this method of maximizing the factor-variable correlation (Sum of Squared) is simply another tendency of quantification and giving higher weightage to variables that 'move in tandem' and lower weights to those variables that 'move astray'. But there are no a-priori justifications for doing so. However, it is still considered to be better than giving weightages on the basis of individual value-judgement, and is both popular and widely used by researchers. A variant of this PC

Method presumes that variables that significantly affect spatial spread of facilities have the tendency to be unevenly distributed over space (and time). Consequently they have high dispersion or variance and must also be given higher weightages while constructing the composite index. This can be done by finding out such a composite factor that would maximize the Sum of Squared Projections of the variables - the variables retaining their variance and not being transformed to have equal standard deviation through normalization.⁴

However any of the two PC methods must firstly make the data matrix scale-free, since any linear scale-transformation would affect the weights attached to the variables and will change the composite factor score of each observation. One of the methods that has been proposed is to divide the data matrix by its mean to get the scale-free transformed data matrix.

Another method of compositing is to have a composite factor such that it has equal correlation with each variable - implying that the variables are equally important. A variant to this method is the 'Unequal Correlation Method' where the weights are such that the composite factor has unequal correlation with the variables. If variables that are more disperse across space (or time) are thought to be more important, then the weighting scheme should be such that the correlation of the variables with the 'factor' varies directly with the Coefficient of Variation of the variables. On the other hand, if it is felt that higher representation should be given to those variables that have lower dispersion over space, then the correlations should vary inversely with the CV of the variables. This second approach would, however, be against the notion obtained from the experience of regional development, and therefore has limited validity.

In the present study we accept the reality that significant variables measuring development are widely dispersed over space (and time) and there is marked inequality among regions regarding their development levels. Consequently, the Modified PC Analysis⁵ is used to construct composite indices for each of the groups of variables by finding out such a 'Weight' vector that maximizes the sum of squared projection of the transformed

data matrix - after transforming them by dividing by mean.⁶ AGDEV, INDDEV and HUDEV were thus prepared using the MODPCA method. A Composite index of overall development level was also prepared. This was done in 2 ways. The first method used MODPCA on the 3 indicators AGDEV, INDDEV and HUDEV to arrive at a composite index of development - represented by DEVT1. Secondly, a simple summation of the 3 indicators already obtained gave us the second composite index of development, represented by DEVT2. Thus, total 4 indices were prepared by using MODPCA: 3 development indices – AGDEV, INDDEV and HUDEV; and 1 Composite Development index – DEVT1. Also the conventional indicator of development, GDP (NSDP for the states) has been used.

The process of combining was done using the whole data set, i.e. for 16 States and India for all the 25 years (as if India is the 17th observation). This implied that the standardization was done using the same scale and the composite scores thus prepared would be comparable among themselves. In almost all cases the First Principal Component could explain more than 70% of the variation in the data matrix. The study of development was then ventured into using these indices.

Trends in Levels of Development

There has been a sustained rise in the parameters measuring level of development, both at the National and at the state level during the 25 years of study. If we look at National data (Table 1) we find that all the three components of development – AGDEV, INDDEV and HUDEV have shown a continuous rise during 1971-95, the factor scores have increased by the largest proportion for AGDEV (almost five times) followed by HUDEV (by 60%) and INDDEV (by 50%).

Table 1
Composite Indices of Development in India - 1971 - 1995

YEAR	agdev	inddev	hudev	devt1	devt2	pc gdp
						Rs.
1971	0.356	1.425	2.027	1.812	6.696	1519
1972	0.090	1.390	2.049	1.369	5.310	1473
1973	0.101	1.475	2.075	1.265	5.022	1507
1974	0.720	1.424	2.068	1.361	5.430	1487
1975	1.427	1.399	2.086	1.546	6.144	1593
1976	1.367	1.519	2.107	1.578	6.251	1574

1977	1.451	1.521	2.137	1.609	6.376	1661
1978	1.465	1.581	2.180	1.644	6.513	1717
1979	1.363	1.531	2.228	1.613	6.416	1568
1980	1.429	1.396	2.242	1.592	6.357	1640
1981	1.445	1.478	2.249	1.623	6.468	1696
1982	1.434	1.523	2.310	1.652	6.589	1706
1983	1.527	1.685	2.391	1.744	6.942	1810
1984	1.518	1.655	2.456	1.745	6.972	1835
1985	1.516	1.680	2.505	1.772	7.081	1867
1986	1.505	1.732	2.525	1.805	7.193	1905
1987	1.526	1.703	2.530	1.818	7.236	1943
1988	1.659	1.784	2.557	1.895	7.517	2115
1989	1.681	1.828	2.702	1.954	7.776	2200
1990	1.691	1.858	2.760	1.991	7.923	2299
1991	1.454	1.867	2.766	1.953	7.760	2238
1992	1.499	1.919	2.855	2.021	8.025	2318
1993	1.733	1.966	2.916	2.127	8.429	2423
1994	1.767	2.033	2.992	2.210	8.730	2570
1995	1.737	2.118	3.259	2.305	9.152	2710

Source : Author's calculations based on Data Sources mentioned in the Appendix, using the Methodology already mentioned

When the composite indices of development were looked into, it was observed that all the three indices – PCNSDP, DEVT1 and DEVT2 fluctuated during the Seventies, but steadily increased thereafter, by about 65 – 70% during 1981-95. More or less similar trends were observed for the major states also. It was also observed that while during 1971-76 and during 1976-81 quinquennas AGDEV had been providing the main impetus to the overall development level of the regions, in the later periods, specially after 1986, INDDEV has been much more instrumental in determining the overall development level at both national and regional level.

Thus it can be commented that the period 1971-95 has experienced a steady improvement of development levels in both the nation as a whole and the major states. Some sort of Structural transformation may also be hinted at. However, one has to keep in mind that the growth seems impressive more because the initial levels were too low. While it must be accepted that we have come a long way compared to from where we started, the absolute levels are still not satisfactory, specially if compared to international standards.

Regional Disparity in Development

One of the major concerns of economic planners in India has been the regional inequality in the fruits of development. There had been a huge gap between economically active and vibrant regions and the hinterland during the pre-independence period in terms of availability of facilities and this manifested itself in the form of unequal levels of development. On attaining independence, our proclaimed objective was to bring about regional equality in growth and development even at the cost of efficiency and aggregate growth. Whether that intention has fully materialised needs to be examined.

Hierarchy of the states

Let us now examine the relative position of the states regarding different development indices (Table 2). It can be seen that the hierarchy has remained fairly similar over time – with the same states retaining the top and bottom positions.

Table 2
Rank of the States - Quinquennial Average of Sectoral Development Indicators

State	AGDEV					INDDEV					HUDEV				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Andhra	10	13	9	11	11	15	14	11	14	14	13	13	12	12	12
Bihar	16	17	17	17	17	11	16	13	12	12	16	17	17	17	17
Delhi	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gujarat	6	5	5	9	9	4	5	3	3	3	9	7	8	7	7
Haryana	3	3	3	3	3	9	7	6	6	6	7	10	9	8	8
Himachal	11	15	16	16	15	16	15	12	11	8	6	5	6	5	5
Karnataka	5	6	7	9	7	9	8	10	10	9	10	8	10	9	9
Kerala	4	4	4	5	4	7	9	9	9	11	2	2	2	2	2
Madhya	14	17	14	4	14	10	12	14	13	13	14	16	14	13	14
Maharastra	13	9	13	13	11	2	2	2	2	2	3	4	3	4	3
Orissa	15	14	11	14	16	15	11	16	17	17	16	13	13	14	15
Punjab	2	2	2	2	2	13	10	7	5	5	4	3	4	6	6
Rajasthan	9	12	12	13	13	13	14	15	17	15	17	15	16	15	13
Tamilnadu	8	11	16	15	9	5	4	4	4	4	5	6	5	3	4
Uttar	12	7	6	7	6	17	17	17	15	16	12	14	15	16	16
Wbengal	7	8	8	6	5	3	3	5	7	10	8	9	7	10	10
India	17	10	10	10	12	6	6	8	9	7	11	11	11	11	11

Table 2 (contd)
Rank of the States - Quinquennial Average of Composite Development Indicators

State	PCNSDP					DEVT1					DEVT2				
	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5	Q1	Q2	Q3	Q4	Q5
Andhra	12	13	11	11	13	13	12	12	12	12	13	12	12	12	12
Bihar	17	17	17	17	17	17	17	17	16	17	17	17	17	17	17
Delhi	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
Gujarat	6	5	5	5	5	6	4	5	5	5	7	6	6	5	5
Haryana	4	4	3	3	4	7	6	4	4	4	6	5	4	4	4
Himachal	5	6	8	8	10	11	11	11	11	10	10	11	11	9	10
Karnataka	11	10	10	10	9	9	9	9	9	9	9	9	9	10	9
Kerala	10	11	12	13	11	4	6	6	7	7	3	4	5	6	7
Madhya	13	14	13	16	16	14	16	14	17	15	14	16	15	16	15
Maharastra	3	3	4	4	2	2	2	3	3	3	2	3	3	3	3

Orissa	15	15	15	15	15	16	15	15	15	16	16	15	13	15	16
Punjab	2	2	2	2	3	3	3	2	2	2	4	2	2	2	2
Rajasthan	14	12	14	12	12	12	13	16	14	13	12	13	16	14	13
Tamilnadu	9	9	9	9	6	8	8	7	6	6	8	7	7	7	6
Uttar	16	16	16	14	14	16	15	14	13	14	15	14	15	13	14
Wbengal	7	7	6	7	7	5	8	8	8	9	5	8	8	8	9
India	8	9	7	6	8	10	10	10	10	11	11	10	11	11	11

Source :Same as Table 1

Delhi captures the top-most position for almost all the development parameters for most of the years. This may have been caused by simultaneous working of different factors like - its small geographical size, its importance as the National Capital City and the huge capital expenditure incurred to modernize, develop and promote the National Capital Territory and make it comparable with other international cities.

If we look more closely, a regional pattern emerges from the hierarchy of the states. It seems that the North-western, and Western states are consistently doing better in terms of PCNSDP and composite measures of development. In case of AGDEV the North-western states are doing well all along, with the Southern states coming up since the '80s. in the post reform period the Western states have also improved their position. On the other hand, in case of INDDEV, the Western states are leading with the North-western states also coming up since mid-80s. in case of HUDEV the Southern states are doing well along with the Western states. This clearly reflects a regional pattern with the Eastern, Northern and Central regions performing poorly from where only West Bengal reaching close to the national average level of development. This regional disparity is of grave concern. The only consolation is that when we look at the Rates of improvement (since all our measures except PCNSDP are indices, we refrain from using the term 'Growth Rate'), we find that both for AGDEV and INDDEV, the eastern states are showing remarkable performance from late '80s onwards. Perhaps they have started late and this improvement is yet to be translated to improvement in their ranks. Still it seems that there is a tendency for the erstwhile lagging regions to slowly catch up with the other advanced regions of our country, which is heartening and desired.

Regional Disparity and Convergence - Divergence theory

Table 3 shows the inter-state variation in the different indicators of development for the 1971-95 period. It is observed that substantial variation exists in the level of development among the states, measured by the Coefficient of Variation (CV). The variation is higher in Agricultural development compared to Industrial development till late '70s. Beyond 1980, there seems to be a sudden jump in the CV for INDDEV. On closer inspection it was found that sudden high growth of Delhi as an industrial power is the root cause of it. If we exclude Delhi, we find that the earlier trend is still continuing. This indicates that Agricultural development has been less equitably spread over regions than industrial development.

Table 3
Inter-State Variation in Composite Indices of Development
Coefficient of Variation (%) 1971 - 1995

YEAR	All 16 Major States						Excluding Delhi		
	agdev	inddev	hudev	pcnsdp	devt1	devt2	inddev	devt1	devt2
1971	33.0	40.1	23.1	40.6	32.5	30.2	29.1	17.8	17.7
1972	29.6	39.7	24.8	39.5	32.3	30.3	30.4	16.4	16.2
1973	28.3	36.4	23.3	38.5	31.1	28.9	29.7	16.2	15.9
1974	34.1	37.0	23.6	41.3	32.9	30.6	32.8	16.8	16.6
1975	32.2	35.9	23.8	39.7	32.0	29.9	29.9	16.7	16.6
1976	39.7	35.8	25.1	43.0	32.5	30.9	28.4	17.4	17.4
1977	39.0	33.1	24.6	41.0	32.2	30.4	28.4	17.6	17.5
1978	37.8	34.5	25.1	41.8	33.1	31.1	28.5	17.8	17.7
1979	37.4	33.0	25.1	46.8	32.3	30.4	27.3	18.5	18.5
1980	34.3	32.3	23.5	42.3	29.5	27.9	27.1	17.4	17.4
1981	33.8	32.9	22.7	42.7	30.1	28.2	24.5	17.3	17.3
1982	35.5	34.3	21.8	46.8	30.8	28.6	24.9	17.1	17.1
1983	30.9	82.4	20.4	41.1	44.7	40.1	25.9	17.0	16.7
1984	37.2	83.7	20.6	42.1	46.8	42.0	27.5	18.6	18.2
1985	46.4	83.3	20.9	45.8	50.4	45.2	27.6	19.5	18.9
1986	64.1	78.4	20.8	46.2	55.2	47.7	27.7	25.6	20.9
1987	53.1	82.9	21.8	50.1	55.7	49.9	27.0	20.3	19.7
1988	43.3	79.4	21.8	44.4	51.1	45.9	24.8	19.5	19.0
1989	39.4	80.0	21.3	46.0	48.6	43.5	25.7	20.6	19.9
1990	42.8	83.2	20.0	44.9	50.1	44.6	26.3	21.0	20.1
1991	49.6	87.7	19.8	48.1	52.7	47.0	25.2	21.5	20.7
1992	55.0	91.1	20.4	45.8	55.5	49.9	27.1	22.8	21.8
1993	52.6	94.6	20.3	45.9	55.8	50.1	28.2	22.2	21.2
1994	37.1	82.1	20.6	50.8	53.0	46.3	30.4	30.2	27.0
1995	38.2	80.6	18.4	46.5	45.7	40.2	31.6	24.0	22.4

More important than the levels of variation are the trends exhibited by the variation, i.e. whether the distribution is showing greater equality or otherwise over time. This has

been done in economic literature using the two tests - σ test and β test. The former uses any rise (or fall) in CV as an indicator of rising (or falling) inequality. The later finds out the association between growth rates of indicators and their base levels. If the association is positive, β test would conclude that higher initial levels lead to higher growth rate and hence Divergence in development levels. A negative association would indicate Convergence.

Various researchers have studied the trends in Inter-State variation in economic development and tried to find out whether the inequalities have widened over time. Many of them have commented that the pattern has followed the much discussed 'Inverted-U' relationship, whereby the variation (measured mostly by coefficient of variation) has increased during the immediate period following development efforts.⁷ But as the development results started to 'spread' and 'trickle down', the variation started to decline. Others, however have refuted the existence of such a relationship in India and have shown that the relationship is in fact an 'Upright-U' one⁸. They point out that there had been a decline in the inter-state differences during the Fifties and the early and middle Sixties, but thereafter the differences increased noticeably. Let us now investigate this issue using the present framework (Table 4).

σ test: The development experience of the states seems to be somewhat varied if the σ test is used. Differences in AGDEV seem to have increased during the '70s, fluctuated thereafter till 1983, but again increased significantly since then. Only during 1993-95 it showed signs of fluctuating again. On the contrary, inter-state differences in INDDEV declined steadily till 1982 (much of which can be attributed to the state control over industrial licenses and hence on their location, and to the effort of the State to disperse the PSUs and Private units across the nation – specially towards hitherto backward areas). It showed fluctuations thereafter but has shown marked increase since 1989, which may be linked to the decontrol of the industrial sector in particular and liberalization of the economy in general. Regional variation in Human development has however remained steady over the years along with an overall declining trend. When the composite indices of development were studied, it was observed that variation in all the three indicators PCNSDP, DEVT1 AND DEVT2 across states remained steady during 1971-82. But thereafter it showed an M-shaped pattern with

alternate rise and fall in inter-state variation. Specially, in the immediate post-reform period, the disparity seems to have increased. Only during 1994-95 a tendency of arresting the rising trend is seen.

β test: For conducting the β test we divided the period into 5 quinquennas. This has the additional advantage that the last quinquenna (1991-95) matches perfectly with the immediate post-reform period in Indian economy. The average annual improvement rates in each quinquenna have been regressed on the initial level with the states as observation.

Table 4
Trends in Regional Inequality in Development
 σ and β tests for Convergence

	CV Test or σ Test					Correlation Test or β Test					Final Conclusion				
	71-76	76-81	81-86	86-91	92-95	71-76	76-81	81-86	86-91	92-95	71-76	76-81	81-86	86-91	92-95
15 major states															
Agdev	Div	Conv	Div	Conv	Conv	Div	Conv	Conv	Conv	Conv	Div	Conv		Conv	Conv
Inddev	Conv	Conv	Div	Div	Div	Conv	Conv	Div	Div	Div	Conv	Conv	Div	Div	Div
Hudev	Div	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv		Conv	Conv	Conv	Conv
Pensdp	Div	Conv	Div	Div	Div	Div	Conv	Div	Div	Div	Div	Conv	Div	Div	Div
Devt1	Div	Conv	Div	Conv	Conv	Conv	Conv	Div	Div	Div		Conv	Div		Div
Devt2	Div	Conv	Div	Conv	Div	Conv	Conv	Div	Div	Div		Conv	Div		Div
High Income states															
Agdev	Div	Conv	Div	Conv	Conv	Div	Conv	Div	Conv	Conv	Div	Conv	Div	Conv	Conv
Inddev	Conv	Conv	Div	Div	Div	Conv	Conv	Div	Div	Div	Conv	Conv	Div	Div	Div
Hudev	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv	Conv
Pensdp	Div	Conv	Div	Div	Conv	Div	Div	Div	Conv	Div	Div		Div		
Devt1	Div	Conv	Div	Div	Conv	Div	Conv	Div	Div	Conv	Div	Conv	Div	Div	Conv
Devt2	Div	Conv	Div	Div	Conv	Div	Conv	Div	Conv	Conv	Div	Conv	Div		Conv
Middle Income states															
Agdev	Div	Conv	Div	Div	Conv	Div	Conv	Conv	Div	Div	Div	Conv		Div	
Inddev	Div	Conv	Conv	Div	Div	Div	Conv	Conv	Conv	Div	Div	Conv	Conv		Div
Hudev	Div	Conv	Div	Conv	Div	Conv	Conv	Div	Div	Conv		Conv	Div		
Pensdp	Div	Div	Div	Div	Conv	Div	Conv	Conv	Conv	Conv	Div				Conv
Devt1	Conv	Conv	Div	Div	Div	Conv	Conv	Div	Div	Conv	Conv	Conv	Div	Div	
Devt2	Conv	Conv	Div	Div	Div	Conv	Conv	Conv	Div	Conv	Conv	Conv		Div	
Low Income states															
Agdev	Div	Conv	Div	Conv	Div	Conv	Conv	Conv	Conv	Conv		Conv		Conv	
Inddev	Conv	Div	Conv	Div	Div	Conv	Conv	Conv	Conv	Div	Conv		Conv		Div
Hudev	Conv	Div	Div	Div	Div	Conv	Conv	Div	Conv	Div	Conv		Div		Div
Pensdp	Conv	Div	Conv	Div	Div	Conv	Conv	Conv	Div	Div	Conv		Conv	Div	Div
Devt1	Div	Div	Div	Conv	Div	Conv	Conv	Conv	Conv	Div				Conv	Div
Devt2	Div	Div	Div	Conv	Div	Conv	Conv	Conv	Conv	Div				Conv	Div

It has been observed that AGDEV shows signs of divergence only during the first quinquenna (1971-75) but converges during all the next four periods. INDDEV, on the

contrary, exhibits converging tendencies during the first two periods, and diverging tendencies thereafter. HUDEV has however shown converging tendencies all throughout.

If we look at composite indices, we find that all the indices - PCNSDP, DEVT1 and DEVT2 show similar patterns during 1976-95. While during 1976-81 period there was some converging tendencies, diverging tendencies have been experienced thereafter. Only during 1971-76 while PCNSDP exhibited diverging tendencies, DEVT1 and DEVT2 exhibited convergence.

However, interesting results were thrown up when we classify the states into High income, Middle income and Low income groups based on their PCNSDP relative to the national per capita GDP.⁹ It was observed that for AGDEV, while the high and low income states are experiencing convergence in recent years (1986-91 and 1991-95), there is divergence among middle income states. For INDDEV, while diverging tendencies among high income states are evident from 1981 onwards, for the middle and low income states such divergence is observed only in the post-reform period. The rising disparity in HUDEV among the middle and low income states is also contrary to the convergence evident in the high income states. PCNSDP is exhibiting diverging tendencies in the high and low income states but convergence for the middle income states. This indicates that there are slow movers even among the better-off states and good performers among the laggards, while the middle ones are doing average. If we look at the composite indices DEVT1 and DEVT2 we find that for the high and middle income states, they are converging till 1980s, diverging during the '80s, but again converging in the immediate post reform period. On the contrary, the low income states exhibited convergence in the first four periods, but divergence in the post-reform period. This indicates that the increasing regional disparity in the post-reform period has been mainly due to the divergence within the low income states. This has been mainly due to the deceleration of some of our already lagging states (e.g. Bihar registered a Negative PCNSDP growth rate during 1991-95, Uttar Pradesh had a growth rate of 0.6% p.a. while Orissa averaged only 1.2%). The brunt of the post-reform restructuring of the economy seems to be borne mostly by these relatively poorer states. The private decision makers seem to be avoiding these regions - a major cause of which may be lack of proper

infrastructural facilities in those areas. Other causes may be doubt over stable economic policies and general business and political atmosphere in those regions.

Conclusion: Broadly speaking, it can thus be concluded that variation in development indicators associated with the real production sectors have shown cyclical pattern but with a steadily rising trend, and specially since late Eighties there has been a noticeable increase in the interstate variation in development indices. The regional disparity seems to have increased in the post-reform period, a major cause of which is further slowing down of the low income states. In fact, the difference between the Average development level of the high income states and that of the low income states have widened during the post-reform period. This is a matter of serious concern.

Intra-state Variation in Levels of Development

It has been so far indicated that inter-state differences in development is a major characteristic of development experience in India. Let us come down one further level and look at Intra-state variations in development. For this purpose the same Composite Indicators of Development were prepared for the Districts of the 16 states for 3 time points - 1971, 1981, 1991. The analysis is based on these District level scores. Intra-state variation is then measured by the CV obtained from the district scores of that state, while their mean gives the Average level of development. Table 5 gives the Average level and Coefficient of Variation exhibited by the different indicators of development for the states.

It can be observed that in 1971, the top position in Average level of AGDEV was occupied by Punjab and the bottom by Himachal Pradesh. For INDDEV they were West Bengal and Himachal Pradesh, and for HUDEV it was Kerala at the top and Haryana at the bottom. In the overall scale of development, Himachal Pradesh stayed at the bottom with West Bengal and Kerala at the top. The situation remained similar in 1981 except the fact that Kerala overtook West Bengal in INDDEV also. In 1991, this trend continued and West Bengal dropped to the 4th position in INDDEV, being surpassed by Punjab and Andhra Pradesh also.

Table 5

Levels and Variation in Development Indicators within the States

a) Average Levels of Development Indicators and CV - 1971

State	Average of the Districts					CV among the Districts				
	Agdev	Inddev	Hudev	Dev1	Dev2	Agdev	Inddev	Hudev	Dev1	Dev2
Andhra Pr.	1.3819	0.4853	1.6056	0.4533	3.4728	50.10	79.39	9.25	73.26	31.14
Bihar	0.7660	0.2412	1.3297	0.2319	2.3369	42.11	73.15	12.56	63.09	17.29
Gujarat	1.3022	0.5974	1.7411	0.5450	3.6407	56.00	92.15	11.22	84.81	30.33
Haryana	1.6413	0.5137	1.5969	0.4840	3.7519	44.84	55.56	4.84	50.21	23.54
Himachal Pr.	0.0142	0.1244	1.7944	0.1181	1.9329	61.11	49.51	11.90	43.14	11.06
Karnataka	1.4695	0.4488	1.6307	0.4257	3.5490	46.75	108.23	10.36	96.05	29.41
Kerala	1.7484	0.5899	2.6110	0.5583	4.9493	27.32	53.61	9.67	47.93	16.17
Madhya Pr.	0.5656	0.2155	1.9898	0.2104	2.7709	40.86	107.76	41.80	92.40	31.50
Maharashtra	0.9553	0.3946	1.7864	0.3679	3.1363	42.88	116.20	14.88	104.87	24.82
Orissa	0.5892	0.1742	1.8754	0.1758	2.6389	52.04	79.06	19.61	66.55	19.30
Punjab	3.5693	0.8462	1.7062	0.8137	6.1216	28.08	81.95	5.08	73.80	28.52
Rajasthan	0.4451	0.2056	2.5363	0.2033	3.1871	65.55	159.38	69.78	135.42	57.72
Tamil Nadu	2.6725	0.7322	1.7630	0.6947	5.1676	28.75	44.12	5.78	39.21	18.21
Uttar Pr.	1.3431	0.5594	2.6634	0.5221	4.5659	59.41	109.42	30.99	98.51	34.03
W. Bengal	0.9249	1.0123	2.1427	0.8814	4.0799	51.13	161.38	25.51	154.38	56.26

b) Average Levels of Development Indicators and CV - 1981

State	Average of the Districts					CV among the Districts				
	Agdev	Inddev	Hudev	Dev1	Dev2	Agdev	Inddev	Hudev	Dev1	Dev2
Andhra Pr.	3.3370	1.1108	1.2442	0.8123	5.6920	46.79	302.88	11.44	288.93	64.13
Bihar	2.4813	1.0394	2.3187	0.7720	5.8394	33.73	65.39	13.39	62.01	24.85
Gujarat	2.7211	0.6319	1.1945	0.4737	4.5476	34.81	88.19	21.72	82.37	25.38
Haryana	5.2791	0.6613	1.1986	0.5096	7.1390	23.93	84.05	3.71	76.30	20.26
Himachal Pr.	0.4839	0.1421	1.4442	0.1218	2.0702	104.71	54.88	35.00	47.03	38.92
Karnataka	2.5327	0.7693	1.6196	0.5741	4.9214	27.59	100.21	19.29	94.29	28.02
Kerala	4.5436	2.2414	1.6774	1.6144	8.4625	31.65	48.00	8.66	46.69	23.22
Madhya Pr.	1.7197	0.2244	1.2563	0.1841	3.2004	47.33	85.87	25.70	73.71	30.71
Maharashtra	2.1066	0.3944	1.3677	0.3067	3.8687	33.21	70.99	9.90	64.30	21.51
Orissa	1.5766	0.2812	1.6735	0.2285	3.5313	33.05	57.50	14.35	50.24	18.38
Punjab	7.9899	0.8737	1.2653	0.6752	10.1288	13.08	54.22	4.44	49.13	12.06
Rajasthan	1.6771	0.1781	2.3982	0.1670	4.2534	53.18	62.10	55.22	51.78	47.09
Tamil Nadu	4.1326	0.8670	1.3546	0.6483	6.3543	27.29	42.63	6.00	39.95	18.91
Uttar Pr.	3.1015	0.4496	2.8428	0.3712	6.3938	44.82	93.33	143.09	80.06	68.17
W. Bengal	2.1804	1.1694	1.3744	0.8479	4.7243	26.16	138.75	31.60	134.18	46.70

We are however more concerned with Intra-state variation in the Development levels. The Coefficient of Variation in each of the development indicators separately for each state are also reported in Table 5. It can be noted that the intra-state variation is substantially high for many indicators and many states.

Highest intra-state disparity was observed during 1971 in the states of Rajasthan for AGDEV and HUDEV, and in West Bengal for INDDEV. The composite indices of development exhibited high inter-district disparity in the states of Rajasthan, West Bengal, Madhya Pradesh and Uttar Pradesh.

c) Average Levels of Development Indicators and CV - 1991

State	Average of the Districts					CV among the Districts				
	Agdev	Inddev	Hudev	Devt1	Devt2	Agdev	Inddev	Hudev	Devt1	Devt2
Andhra Pr.	2.9616	1.4465	2.2146	1.0439	6.6227	22.31	293.52	27.68	268.56	63.30
Bihar	2.9031	1.0427	1.6955	0.7642	5.6413	49.35	64.48	11.54	59.42	32.97
Gujarat	2.4677	0.6964	1.6416	0.5286	4.8057	38.39	85.48	7.27	75.07	26.25
Haryana	6.4563	1.0209	1.5871	0.7901	9.0644	21.83	88.39	4.50	75.41	17.83
Himachal Pr.	0.0000	0.2097	1.8561	0.1824	2.0658	n.a.	59.75	27.05	48.24	27.18
Karnataka	2.7493	0.9160	1.6325	0.6771	5.2979	33.96	148.21	8.15	133.17	36.63
Kerala	4.1479	2.3756	2.0256	1.6679	8.5491	18.04	47.67	7.31	44.65	11.60
Madhya Pr.	1.7658	0.2858	1.3953	0.2430	3.4468	33.12	91.22	9.48	72.84	23.84
Maharashtra	2.0030	0.5518	1.6725	0.4281	4.2273	26.78	88.51	5.99	75.85	18.87
Orissa	1.6132	0.3143	1.3883	0.2598	3.3158	25.61	54.88	10.18	45.84	18.06
Punjab	7.1410	1.5624	1.6055	1.1566	10.3089	17.21	82.57	5.66	74.38	20.88
Rajasthan	1.7846	0.2202	1.9071	0.2119	3.9119	54.05	63.26	17.92	46.65	27.77
Tamil Nadu	3.7591	1.0713	1.6973	0.7934	6.5276	19.44	47.48	5.35	42.60	14.16
Uttar Pr.	2.9967	0.7469	2.6943	0.5931	6.4380	48.68	218.06	96.65	182.52	54.91
W. Bengal	2.8344	1.2967	2.3799	0.9473	6.5110	36.62	138.85	23.18	126.11	37.96

The situation was similar in 1981 when the intra-state variation was observed to be substantially high in the states of Rajasthan for AGDEV, West Bengal for INDDEV and Uttar Pradesh for AGDEV. Composite indices of development were highly dispersed in West Bengal, Uttar Pradesh and Andhra Pradesh. During 1991, the trend continued and Rajasthan, Andhra Pradesh and Uttar Pradesh exhibited maximum inter-district variation in Agriculture. Industrial and Human development respectively.

It is also to be noted that the intra-state disparity is high in some states where the average level itself is low, e.g. Rajasthan, Uttar Pradesh, Madhya Pradesh and Bihar. This is of major significance since one can easily form a notion regarding how far underdeveloped some of the districts in those states are. This also implies that these states are not only suffering from low average level of development and infrastructure, but also that there are only a few isolated pockets of development in those states while the rest of the districts are lagging far behind. Moreover it can also be seen that intra-state variation seems to be low in the advanced states (i.e. states with high average value of the indicators). This implies that those developed states have managed to improve their average level not by concentrating on a few isolated regions but by spreading the facilities more evenly across space. It thus comes out that the inequality is low at the upper end of development.

To test whether the inequality follows any pattern, specially to check whether the intra-state variation depends on the average level itself, the mean level and the coefficient of variation were subjected to Correlation Analysis. It was observed that that the Correlation Coefficients were small and insignificant for the Development indicators and there seems to be no linear association between the average level and intra-state disparity. This issue was further investigated with the help of 'Scatter Plots' to form an idea about the nature of the association. It was observed that for Industrial development indicator and the Composite Development indicator DEVT1, there emerges an Inverted-U shaped relation between the Coefficient of Variation and the Average level of the States. This supports the often discussed Kuznet's hypothesis that the inequality in development is low at lower ends of development level, increases as development proceeds, and then again decreases at upper levels of development. States with low levels of industrial and composite development have low intra-state disparity, states at middle levels have higher disparity, and again states at further higher levels have low intra-state disparity. Exceptions to this trend have been West Bengal, which has high inequality in spite of its high development level, and Rajasthan, which also has high inequality in spite of its low development level.

Summary Findings and Policy Issues

The major findings of this section can be summarized as:

1. There has been noticeable rise in levels of development during the study period with agricultural sector showing the greatest improvement.
2. The hierarchical position of the states has remained more or less similar over the period 1971-95.
3. Relatively better development levels are available in Delhi, Punjab, Kerala and Maharashtra.
4. Relatively poor development levels exist in Bihar, Madhya Pradesh, Orissa and Rajasthan.

5. Regional variation regarding development indices have shown fluctuations but with a rising trend - specially after mid eighties and more pronouncedly in Industrial development since 1989.
6. Regional differences in Human development index is low while that in Agricultural development index is higher than that in Industrial development.
7. Regional disparities have increased in the immediate Post-reform period with the low income states being more severely hit by the restructuring of the economy.
8. The states are not homogeneous units with substantial intra-state disparity in the levels of development and its components.
9. The intra-state variation in development level follows the Inverted-U hypothesis - specially Industrial Development index, and the composite index DEVT1. States with low average level of development have low disparity; disparity increases as development level improves, and then again, states at the upper end of the development scale have lower intra-state disparity. Exceptions are Rajasthan & West Bengal, both of whom have high disparity in spite of being near the lower and upper end of the average level respectively.

It can be concluded that there exists considerable variation in the levels of development - across regions over the country and also within each state. The area of concern is that the disparity seems to be widening over time, specially in the post-reform period. Advanced states are taking full advantage of their position in the liberalised and globalised scenario, while the weaker states are lagging far behind. This fact, when combined with the fact that the relative position of the states seems to be fairly similar over the years, must be noted with caution. This implies that the fruits of development are being enjoyed by few top states while the bottom ones are languishing. The difference between these two groups is increasing recently, indicating that perhaps the post-liberalization era has affected different sets of states in different manner - rewarding the better-off ones and neglecting the weaker ones. The fact that disparities in Agricultural development showed an increasing trend during the early seventies means that the period of Green Revolution was also accompanied by regional inequality. The effort towards augmenting growth therefore

seems to be associated with rising regional inequality in India. However, this does not translate into concluding that there is a strong trade-off between growth and equity in India where sacrificing the latter have ushered in the former. Rather, the spurts in growth have remained sporadic and short-lived. Rising regional inequalities have stifled growth and there has been 'sharing of underdevelopment' rather than 'sharing of growth'.

Two major factors seem to be operating. Firstly, efforts towards high growth with emphasis on private decision makers have been lopsided. Rational private decision makers tend to concentrate around centres where facilities and ready markets are available. High inequality in infrastructural facilities and market conditions led to concentration of private players in few regions - both during the Green revolution in the agricultural sector and in the post-reform liberalised industrial sector. This has accentuated regional disparity in the respective sectors. Secondly, to counterbalance rising social and political unrest against regional disparity, the authorities have gone slow on the growth front lest things go 'out of control.' Efforts for achieving high growth have been half-hearted and the 'Big Push' thus never came. The economy thus remained trapped within a moderate long run growth rate but with an increased disparity. Against this backdrop, the current Tertiary sector revolution has to be thus monitored cautiously lest it brings about a fresh wave of Inequality among states.

A few possible solutions to this problem may also be indicated. It is now accepted that henceforth the State will have a less active role to play. It should therefore turn its attention, resources and emphasis towards being a facilitator rather than a producer. Providing adequate infrastructural facilities in the hitherto lagging regions will work better rather than directing investors to those places. This in itself will be a major step towards equitable regional development. Secondly, there must be a shift from Central Planning to Multilevel Planning. The District Development Authorities must be made fully functional with the responsibility and power to draw up local plans, arrange for finance and implement those projects. The potential of these local bodies for effective implementation of development programmes can be realised only when the local information base and decision-making capacities are substantially improved. The national development agencies must, therefore, accord priority to supporting 'citizen participatory processes'. Investment in

training and motivating the people managing these institutions is as important as the creation of infrastructure and human capital. Well-focused, well-managed and pro-active local institutions would be best placed to eradicate inequality. Devolution of political, administrative *and* financial power to the grass-root level is the need of the hour.

Finally it must be pointed out that development process in India has suffered from the misplaced view that high growth can be attained only at the cost of regional inequality. The empirical association between periods of growth and inequality is because none of these issues were given due attention and whole hearted effort, rather than one causing the other. The fact is that there is no trade-off in the importance to be attached to each of the arenas of action as they are interrelated and mutually reinforcing. Future development efforts should be shaped in the light of this experience. Only then can we have both a bigger cake and a more equitable regional shares of it.

Endnotes

¹ For the Data sources see Appendix.

² For comparative studies see Kundu and Raza (1982), Chattopadhyaya and Pal (1972), Chattopadhyaya and Raza (1975) and Kothari, C.R. (1988).

³ For a precise analytical study of various methods of construction of composite indices see Kundu, A. (1980) and Kundu and Raza (1982).

⁴ Kundu, A. (1980).

⁵ This MODPCA method has been evolved by Amitabh Kundu *et al.* Refer to Kundu, A. (1980).

⁶ It is often argued that the mean used should not be the simple average of the indicators, but an weighted average of them, the weights being either area or population of the observations (districts or states), depending on which factor the indicator was standardized by. However here the purpose is to make the variables scale-free and express them relative to a common factor. Hence simple mean will serve our purpose.

⁷ Williamson (1968), Williamson (1965).

⁸ Mathur (1983) obtained such U-shaped pattern for the 1950-51 - 1975-76 period in India for Aggregate Per Capita State Income, and also for Per Capita State Income from Primary, and Tertiary sectors. For Secondary sector he obtained an Inverted-U shaped pattern. Other studies include Rao (1973), Sampath (1977), Mohapatra (1978) and Nair (1982).

⁹ The states in the 3 groups were found to more or less same for all the five quinquennas. Bihar, Uttar Pradesh, Orissa, Madhya Pradesh, Andhra Pradesh, Rajasthan in low income group; Himachal Pradesh, Karnataka, Tamil Nadu in middle income group; and Punjab, Maharashtra, Delhi in high income group all throughout. Haryana and Gujarat had been in middle group initially but replaced West Bengal and Kerala from high income group in later years.

Appendix - Data Sources

CSO - Annual Survey of Industries - Summary Results for Factory Sector, Various Years

CSO - Economic Census - State/District wise Aggregate of Principal Characteristics of Enterprises, *Min. of Planning and Programme Implementation, GOI*, 1980, 1990

CSO - Statistical Abstract of India, Various Years

GOI - Basic Road Statistics, *Min. of Surface Transport, GOI*, Various Years

GOI - Education in India, *Dept. of Education, Min. of HRD, GOI*, Vol. I (s) and II (c), Various Years

GOI - Health Statistics in India, *Min. of Health and Family Planning, GOI*, Various Years

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- GOI - Identification of Backward Areas : Report of the Working Group, *Planning Commission*, February, 1969
- GOI - Indian Agricultural Statistics, *Dept. of Agriculture and Co-operation, Ministry of Agriculture, GOI*,
- GOI - Selected Educational Statistics, *Dept. of Education, Min. of HRD, GOI*, Various Years
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- GOI - The India Infrastructure Report, *NCAER*, 1996
- NSSO - Survey on Employment and Unemployment, *Min. of Planning and Programme Implementation, GOI*, Various Rounds
- RBI - Banking Statistics - Basic Statistical Returns, Various Years
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- Registrar General of India - B-series Tables - General Economic Tables, *Census of India, GOI*, 1971,1981,1991
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- Registrar General of India - District Census Handbook, Town Directory, *Census of India, GOI*, 1971,1981,
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