

# **Economic Liberalization and Regional Disparities in India**

**Special Focus on the North Eastern Region**

**EDITORS**

**A C Mohapatra**

**Chitta Ranjan Pathak**

# Economic Liberalization and Regional Disparities in India

**A Focus on North Eastern Region**

ICSSR - NERC

**Complimentary Copy**

*With best wishes*



**Editors**

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A C Mohapatra  
Chitta Ranjan Pathak

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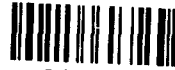
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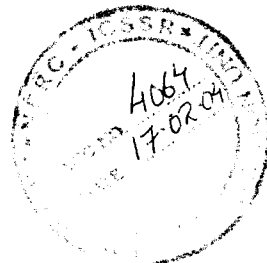


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# **National and Regional Growth Performance in the Indian Economy: A Sectoral Analysis**

*Ashok Mathur*

## **I Introduction**

This paper sets out to examine seven issues related to national and regional growth in the Indian economy. The main focus of attention is on growth performance during eighties and nineties. However, in order to view growth over the last two decades in background of the pattern of growth in earlier decades, a broad sweeping analysis of period since 1950–51 is undertaken on a decadal basis. Accordingly, section II presents decadal growth rates per annum at the national level for each of the three main sectors and the gross domestic product. Sections III and IV discuss regional growth rates, their ranks and the changes, if any, that have come about in the relative hierarchy of the state level growth rates. Section V analyses the impact of regional growth performance on state level economic development in terms of their per-capita incomes. Section VI is devoted to an examination of regional disparities in terms of state level per-capita incomes. Section VII discusses the impact of growth on sectoral structure of the economy, both at national and regional levels. Section VIII poses the question as to which sector can be considered to have been the ‘engine of growth’. Finally, a brief resume of the paper appears in Section IX.

## **II National Level Sectoral Growth Performance**

Growth performance in this section is examined in terms of two sets of data, covering the period 1950–51 to 1999–2000. Till recently the long term data for this period were available only in terms of national income data at 1980–81 prices from 1950–51 up to 1996–97. Data at 1993–94 prices have been available

since 1993–94 but in order to draw upon a single base period series for the maximum period possible, in what we have designated as A series, 1980–81 base year data have been used from 1950–51 to 1996–97 and 1993–94 base year data for the period from 1996–97 to 1999–2000. These data have been taken from the Government of India's Economic Survey (2000 and 2001) for the years 1999–2000 and 2000–2001. In the second, namely Series D, only Economic Survey 2000–2001 data have been used, making use of the recently released data at 1993–94 prices right from 1950–51 onwards. Series D at 1993–94 prices has the advantage over series A in so far as for the more recent period the 1993–94 prices and weight structure would be more appropriate to reflect the changing commodity/services composition of the national product whereas for the period prior to nineties the 1980–81 prices and weight structure would be more in tune with the earlier structure.

For examining the trend of growth rates over the last half a century or so one can periodise in terms of shorter time spans on the basis of alternative criteria. If one's focus were on comparing the growth scenario prior to and after a certain event, the dividing line between periods would have to be determined by dating of the event. Since in the present paper no such event/events have been kept as the primary concern, we have adopted decadal periodization. A quinquennial periodization could also be used, but a decadal period has been considered to have the advantage of longer periods. Further, a decadal periodization fits in automatically and exactly into periodization based on pre-reform and post-reform periodization, since the latter period commences from the beginning of the decade of nineties, i.e., 1991.

The decadal growth rates can be estimated by alternative methods. The simplest is to estimate compound growth rates between decadal terminal points at 1950–51, 1960–61, ... and 1999–2000, which is the latest year for which quick estimates are available. A more appropriate version of essentially the same method is to use 3 yearly average of data at terminal points since it eliminates, or at least reduces, the influence of fluctuations around terminal points on the decadal growth rates. A more accurate method is to fit semi-logarithmic time trend to annual data separately for each decade. The method, which has been used here for estimating decadal growth rates at the national level is different from all these three. It involves estimating average of annual growth rates for each decade and has the advantage of taking into account actual annual growth rate for each and every year within any decade (See Kakwani, 1997, for theoretical superiority of this method). The first step for this method was to obtain absolute data for each of the three sectors. The Annual Economic Surveys give aggregated data for the primary sector ("agriculture, forestry and logging, fishing, mining and quarrying"), the secondary sector ("manufacturing, construction, electricity, gas and water supply") and gross domestic product at factor cost. Tertiary sector gross domestic product estimates were derived by aggregating contributions of "transport, communication and trade", "banking and insurance, real estate and ownership of dwellings and

business services” and “public administration and defence and other services”. At the second stage, annual growth rates for the three sectors and GDP were obtained, from which the five decadal averages were derived. It may be borne in mind that the decadal growth rates for the nineties are derived by averaging nine annual growth rate observations and not ten, since data for the tenth year (2000–2001) are not yet available at the time of writing this paper.

Based on the above method, tables 1 and 2 give decadal growth rates derived on the basis of A Series and D Series data. Graph 1 depicts D Series. As may be observed, for GDP growth rates the decadal estimates show very little difference between the two sets of estimates for each of the five decades, the difference being only of the order of 0.08 at the most. But for sectoral estimates, growth rates based on D Series differ from A Series by a slightly greater margin.

**Table 1: Decadal Growth Rates (percent per annum)—A Series**

<i>Decadal Period</i>	<i>Sector</i>			<i>GDP</i>
	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>	
1. Fifties	3.17	6.27	4.14	3.94
2. Sixties	2.56	5.57	4.64	3.75
3. Seventies	1.93	4.03	4.34	3.16
4. Eighties	3.84	7.16	6.53	5.68
5. Nineties (at 80–81 prices up to 1996–97 and 93–94 prices thereafter)	2.60	6.03	8.20	5.82
6. 1951–2000	2.82	5.86	5.47	4.45

**Table 2: Decadal Growth Rates (per annum)—D Series (at 93–94 prices)**

<i>Decadal Period</i>	<i>Sector</i>			<i>GDP</i>
	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>	
1. Fifties	3.10	6.25	4.27	3.91
2. Sixties	2.37	5.59	4.77	3.70
3. Seventies	1.64	3.91	4.41	3.08
4. Eighties	3.73	6.96	6.72	5.62
5. Nineties (up to 1999–2000)	2.92	5.88	7.77	5.81
6. 1951–2000	2.92	5.77	5.55	4.44

Coming to the trend of decadal growth rates, four points need to be observed.

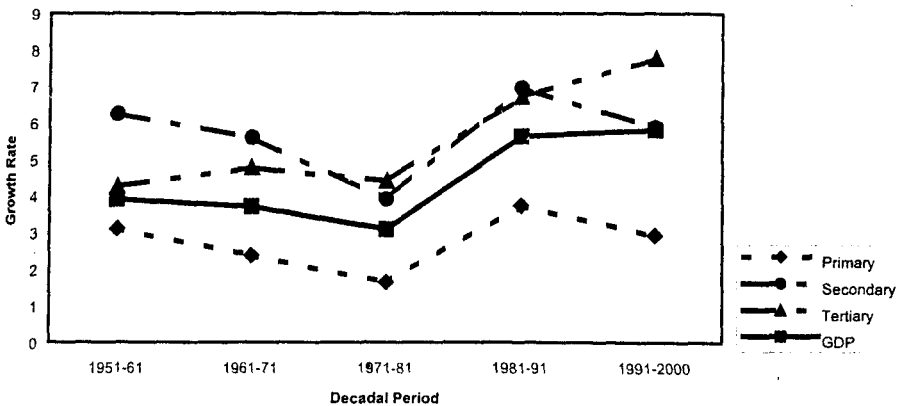
1. First, the aggregate growth of the economy decelerated from fifties till seventies but thereafter it registered a sharp increase during the eighties

from 3.16 to 5.68. During the nine years of nineties the average annual growth rate emerges to be slightly higher by 0.19% at 5.82% according to D Series, but according to A Series the increase in growth rate during nineties is only 0.14% p.a.

2. When one looks at the sectoral growth rates, both agriculture based primary sector and industry based secondary sector exhibit a declining trend from fifties till seventies. The tertiary sector exhibits a fluctuating pattern during the decades of fifties, sixties and seventies. However, during eighties all three sectors shared in the steep rise in growth rate from seventies to eighties.
3. From eighties to nineties, although the GDP growth rate may have registered a marginal increase from eighties to nineties, the behaviour depicted by sectoral growth rates is rather disquieting. Both primary and secondary sector reveal a visible decline in their growth rates. The magnitude and pattern of decline differs depending upon whether one uses series A or series D. In respect of the primary sector series A exhibits a steeper decline in growth rate than series D but in the secondary sector series D shows a steeper decline than series A.
4. It is only the tertiary sector, which exhibits a visible rise in the growth rate from eighties to nineties and has brought about a slight increase in the overall growth rate during the nineties. This is particularly so during the latter half of nineties. This is also the period during which recommendations of the Fifth Pay Commission were implemented.

But both the real production sectors based on agriculture and industry have registered a decline in their growth rates. The tertiary sector growth is essentially a reflection of rising factor incomes but without the backing of a

Graph 1: Decadal Growth Rate ( per annum ) : D Series ( at 93-94 prices )



corresponding rise in productive growth. The rise in tertiary sector incomes which have contributed to its growth has apparently been much more at the upper end of income distribution ladder than at the lower end since the organised activities have fared much better than unorganised ones (*See* Mathur, 2000a). The sectoral growth trends during the nineties thus do not provide a basis for feeling satisfied with the rise in overall growth rate during the nineties. In fact they are quite disturbing.

In the light of the picture, which emerges from a broad sweeping view of growth during the past five decades, one can discern a distinct break from the end of seventies. Whereas the first three decades display a faltering pace of growth, the next two decades exhibit a visible improvement. But in the light of comparative pattern of growth during eighties and nineties, eighties depicts a more robust pattern of growth since nineties shows up serious internal weaknesses in the sectoral pattern of growth.

### **III Regional Growth Performance: Level and Ranks**

We may now turn to regional growth performance. Estimates of regional growth for the period 1961–89 are based on author's earlier study (*See* Ashok Mathur, 1994). For the period 1980–81 to 1995–96 fresh estimates based on SDP Series at 1980–81 prices, brought together by CSO (*See* Central Statistical Organizations, 2000) from SDP estimates prepared by different State Statistical Bureaus, have been drawn upon.

It may be mentioned here that entire State level SDP data from 1980–81 to 1993–94 at 1980–81 prices were re-estimated at 1993–94 prices by splicing the series at 1980–81 prices and the State level series at 1993–94 prices, which have now become available for the period 1993–99. However, results based on 1980–81 price data and the estimates based on 1993–94 prices differed considerably for a number of variables. In the light of these two different sets of results, it has been decided to stick on in this paper to estimates based on 1980–81 price data. Analysis based on 1993–94 price based estimates from 1981–99 is (intended to be) presented in a separate paper subsequently.

#### **(A) 1961–89**

We may first present the scenario for the period prior to 1989. Table 3 gives the average of annual rates of growth of SDP at constant prices of different States during each decade since 1960, as also during the composite 3-decade period of 1961–89. While for sixties the growth rates are based on SDP data at 1960–61 base year prices, for seventies and eighties 1970–71 and 1980–81 constant price series of SDP have been used. The ranks of States in terms of their growth rates are given below (*See also* Dholakia, 1985; Ajit K. Singh, 1985).

Table 3: Average Annual Growth Rates (g) and their Variability (c.v.)

States	1961-70		1971-81		1981-89		1961-89	
	g	c.v.	g	c.v.	g	c.v.	g	c.v.
Andhra Pradesh	2.12	2.85	3.46	2.54	4.72	1.45	3.38	2.12
Rank	14	5	9	7	9	6	11	5
Assam	3.89	1.06	3.70	1.54	5.81	0.57	4.39	0.88
Rank	7	13	7	11	4	16	5	16
Bihar	1.55	4.05	3.20	1.29	4.57	1.07	3.05	1.67
Rank	15	3	14	13	12	9	14	9
Gujarat	5.16	1.15	4.38	3.28	5.80	2.33	5.06	2.27
Rank	4	11	4	5	5	2	3	4
Haryana	6.41	1.38	4.80	1.66	6.29	1.29	5.78	1.47
Rank	2	8	1	10	2	7	1	11
Himachal Pradesh	1.08	2.38	3.32	2.37	4.06	1.60	2.79	1.99
Rank	17	6	12	9	16	5	16	7
Jammu and Kashmir	3.72	2.28	4.34	1.08	4.12	0.69	3.68	1.54
Rank	8	7	5	15	15	14	9	10
Karnataka	4.32	1.37	3.38	2.38	5.25	0.79	4.25	1.46
Rank	5	10	11	8	8	13	6	12
Kerala	3.71	0.51	2.30	0.94	1.66	2.23	2.58	1.03
Rank	9	16	6	16	17	3	17	14
Madhya Pradesh	2.56	5.65	3.63	3.41	5.92	1.22	3.95	2.92
Rank	11	2	8	4	3	8	8	1
Maharashtra	2.93	1.05	4.51	1.13	4.57	0.80	4.00	1.00
Rank	10	12	3	14	11	12	7	15
Orissa	10.25	0.60	2.47	5.21	4.40	2.43	3.44	1.87
Rank	1	15	15	1	13	1	10	8
Punjab	5.55	0.46	4.64	0.61	5.64	0.42	5.24	0.51
Rank	3	17	2	17	6	17	2	17
Rajasthan	3.93	3.18	4.10	3.41	7.47	1.82	5.04	2.57
Rank	6	4	6	3	1	4	4	3
Tamil Nadu	2.23	0.99	2.10	4.38	5.64	1.03	3.19	2.40
Rank	13	14	17	2	7	10	13	6
Uttar Pradesh	1.16	8.46	3.39	2.96	4.58	0.61	3.00	2.76
Rank	16	1	10	6	10	15	15	2
West Bengal	2.55	1.38	3.23	1.51	4.31	0.88	3.33	1.22
Rank	12	9	13	12	14	11	12	13
<b>Coefficient of Correlation</b>	<b>0.61</b>		<b>0.23</b>		<b>0.27</b>		<b>0.25</b>	

Source: Ashok Mathur (1994)

It may be seen from Table 3 that during the three-decade period 1961-89, in terms of the rate of growth of SDP, it is the State of Haryana, which tops the list followed by Punjab, Rajasthan, Assam, Karnataka and Maharashtra. At the other end lie Kerala, Himachal Pradesh, U.P. and Bihar. When we look at decadal

growth rates, a large number of the States have not changed their rank ordering substantially. However, some significant changes which catch the eye have occurred in case of Andhra Pradesh, Madhya Pradesh, Rajasthan, Tamil Nadu and U.P., which have improved growth performance judged in terms of their ranks. On the other hand, Kerala shows a considerable sliding down in terms of growth performance. Punjab has also lost its high rank by four points during eighties. Orissa's steep descent in rank essentially reflects data inadequacies of sixties. Maharashtra in contrast reveals shifts in rank but in opposite direction.

## (B) 1981-96

Table 4 gives state-wise growth rates of SDP for the period from 1980-81 to 1995-96, which is the latest year for which SDP data were available for all the sixteen states at the time of preparing this paper. The annual growth rates in this table have been estimated as compound growth rates with 3 years averaging of SDP at the terminal points. The table also contains growth rates separately for the decade of eighties and the first half of nineties.

**Table 4: Regional Growth Rates of State Incomes**

<i>States</i>	<i>Growth Rate (1981-96)</i>	<i>Ranks</i>	<i>Growth Rate (1981-91)</i>	<i>Ranks</i>	<i>Growth Rate (1991-96)</i>	<i>Ranks</i>
Andhra Pradesh	5.49	1	5.86	4	4.66	1
Assam	2.91	15	3.52	15	1.56	10
Bihar	2.72	16	4.44	12	-1.04	16
Gujarat	4.26	7	4.69	11	3.30	3
Haryana	4.92	4	6.47	2	1.51	12
Himachal Pradesh	3.80	10	4.90	8	1.38	13
Karnataka	4.70	5	5.44	5	3.06	4
Kerala	3.29	13	3.42	16	2.99	5
Madhya Pradesh	3.42	12	4.09	13	1.93	9
Maharashtra	5.43	2	6.20	3	3.72	2
Orissa	2.99	14	4.07	14	0.61	15
Punjab	4.25	8	5.25	7	2.05	8
Rajasthan	5.08	3	6.70	1	1.51	11
Tamil Nadu	4.57	6	5.41	6	2.69	7
Uttar Pradesh	3.63	11	4.86	9	0.93	14
West Bengal	4.20	9	4.83	10	2.78	6

For the fifteen-year period as a whole (1990-91 to 1995-96), the highest growth rate (5.49) emerges to have been in the case of Andhra Pradesh,

followed closely by Maharashtra (5.43), Rajasthan (5.08) and Haryana (4.92). At the other end of the spectrum were Bihar (2.72), Assam (2.92), Orissa (2.99) and Kerala (3.29). The other eight States were in the middle category of growth with annual pace of expansion falling between 4.70 (Karnataka) and 3.42 (Madhya Pradesh). The categorization of states into high, low and middle categories remains roughly the same if one considers eighties by itself. But in the immediate post-reform period there was considerable reordering of the states. The top four category contained Andhra and Maharashtra as in eighties, but Gujarat and Karnataka also moved into this category. On the other hand, Haryana and Rajasthan, which were in the top-4 category during the eighties slumped to 12<sup>th</sup> and 11<sup>th</sup> ranks respectively during 1991–96. At the other end of the scale, whereas Bihar and Orissa were already in the lowest-4 growth rate category, in the nineties Uttar Pradesh and Himachal slumped into it from the middle category where they occupied 9<sup>th</sup> and 8<sup>th</sup> ranks respectively.

### (C) Variations in sectoral growth performance

Sectoral growth rate ranks (Table 5) were by and large not widely different from ranks in terms of overall growth rates. However, in case of some states the ranks of sectoral growth rates during 1981–96 differed from the rank of overall state growth rate by more than 3 ranks. The cases of such states is discussed below briefly.

1. Whereas Andhra Pradesh ranked at the top in terms of its overall growth rate, it occupied eleventh rank in terms of its primary sector growth rate, reflecting its weak agricultural growth during this period.
2. Whereas Gujarat ranked 7<sup>th</sup> in terms of overall growth rate, it was way down at 16<sup>th</sup> rank in terms of primary sector growth rate. Again, it was near the top occupying rank 1 in terms of its secondary sector growth rate. This shows essentially wide disparity between agricultural and industrial growth performance in case of Gujarat.
3. Kerala's overall growth rate rank was 13, but its agricultural growth performance was relatively much better with a rank of 8 in terms of its primary sector growth rate.
4. Maharashtra, which occupied 2<sup>nd</sup> rank in terms of overall growth, was 6<sup>th</sup> and 7<sup>th</sup> in terms of its primary and secondary sector growth performance. Since in terms of its tertiary sector growth it ranked at the top, it shows its growth superiority resting primarily on high growth of income in service incomes, rather than very high agricultural or industrial growth.
5. Although Orissa occupied low 14<sup>th</sup> and 15<sup>th</sup> ranks in terms of its overall and primary sector growth, it was relatively better at 10<sup>th</sup> rank in terms of its secondary and tertiary sector growth.

Table 5: Regional Growth Rates of Sectoral Incomes, 1981-1996

States	Primary		Secondary		Tertiary	
	Growth Rate	Rank	Growth Rate	Rank	Growth Rate	Rank
Andhra Pradesh	1.93	11	6.76	1	6.26	3
Assam	1.78	12	1.95	16	4.44	13
Bihar	1.19	14	4.11	12	4.02	15
Gujarat	0.40	16	6.66	2	5.74	6
Haryana	3.68	5	6.34	3	5.95	5
Himachal Pradesh	1.66	13	5.15	8	5.70	7
Karnataka	2.92	7	5.70	6	6.16	4
Kerala	2.39	8	3.45	14	4.03	14
Madhya Pradesh	2.20	10	4.17	11	5.11	9
Maharashtra	3.03	6	5.30	7	6.92	1
Orissa	1.14	15	4.60	10	4.93	10
Punjab	4.05	3	5.92	5	3.43	16
Rajasthan	3.78	4	5.97	4	6.56	2
Tamil Nadu	4.07	2	3.76	13	5.46	8
Uttar Pradesh	2.28	9	5.15	9	4.74	11
West Bengal	4.65	1	3.32	15	4.45	12

6. In case of Punjab again there was wide disparity in sectoral growth rates as in case of Gujarat. Whereas Punjab ranked 8<sup>th</sup> in terms of its overall growth, it maintained its relatively high relative primary growth position (3<sup>rd</sup>), although not number 1 position which it had almost invariably occupied since sixties. Where Punjab lost its rank badly was in terms of tertiary sector growth, occupying the lowest (16<sup>th</sup>) rank in this sector.
7. A similar sectoral growth disparity is also evident in case of Tamil Nadu, whose overall growth rank was 6<sup>th</sup>. But in primary growth it was 2<sup>nd</sup> from the top while in secondary sector growth it was 13<sup>th</sup>.
8. West Bengal depicts a similar position. Its overall growth rank was 9<sup>th</sup> but in terms of its agricultural growth performance it is known to have shown a very distinct resurgence giving it the 1st rank in terms of primary sector growth. But in terms of its secondary sector growth it ranked 15<sup>th</sup>, revealing a continuing weak position in terms of its industrial growth.

Thus distinct sectoral growth disparity appears to have existed in case of Gujarat, Punjab, Tamil Nadu and West Bengal, all of which have belonged to the category of well-developed states. Maharashtra also falls by and large in the same category.

## IV Changes in Growth Rates and their Ranks between 1980s and 1990s

Some idea about reordering in the hierarchy of states in terms of their growth ranks after the reforms was conveyed in section III (B). Another way of looking at changes in state-wise growth performance between pre- and post-reform periods is to examine state-wise change in the growth rates between eighties (1981–91) and nineties (1991–96) as well as change in growth ranks. For this purpose, the growth rates and their ranks for 1981–91 given in Table 4 have been subtracted from those for 1991–96. These changes are summarised in Table 6 for the overall growth rates as well as for each of the three sectors. A negative difference in growth rates obviously indicates a decline in growth rates from eighties to nineties and vice-versa. On the other hand, a negative change in ranks depicts improvement in rank position of that state and vice-versa.

The first thing which strikes one by a look at Table 6 is that not even a single state exhibited an increase in the aggregate growth rate from 1980s to first half of nineties. The same was by and large true of sectoral growth rates, except in case of primary sector growth rate which depicted a marginal increase in case of Karnataka (+0.91) and Gujarat (+0.72). The maximum decline in overall growth rate was in case of Bihar (–5.47) followed by Rajasthan (–5.19), Haryana (–4.96),

**Table 6: Change in Growth Rates Between Eighties and Nineties (90's–80's)**

<i>States</i>	<i>Overall</i>	<i>Rank</i>	<i>Primary</i>	<i>Rank</i>	<i>Secondary</i>	<i>Rank</i>	<i>Tertiary</i>	<i>Rank</i>
		<i>Change</i>		<i>Change</i>		<i>Change</i>		<i>Change</i>
Andhra Pradesh	-1.20	-3	-1.54	-1	-6.20	5	-6.11	8
Assam	-1.97	-5	-1.55	-1	-3.02	-1	-2.38	-6
Bihar	-5.47	4	-5.35	9	-7.94	7	-4.20	4
Gujarat	-1.39	-8	0.72	-6	-1.44	-5	-4.20	-1
Haryana	-4.96	10	-3.35	4	-7.70	11	-5.71	9
Himachal Pradesh	-3.52	5	-3.22	5	-1.28	-9	-5.91	7
Karnataka	-2.38	-1	0.91	-9	-4.98	4	-4.51	-1
Kerala	-0.43	-11	-0.43	-6	-0.08	-11	-0.72	-14
Madhya Pradesh	-2.16	-4	-0.11	-10	-4.25	-1	-4.43	2
Maharashtra	-2.48	-1	-1.69	0	-3.76	-4	-2.21	-3
Orissa	-3.45	1	-2.65	0	-6.42	5	-3.69	-3
Punjab	-3.20	1	-3.26	4	-3.55	-4	-3.00	-1
Rajasthan	-5.19	10	-4.66	11	-4.69	1	-6.53	8
Tamil Nadu	-2.72	1	-1.28	-3	-2.81	-3	-3.57	-3
Uttar Pradesh	-3.93	5	-1.83	1	-7.36	11	-5.08	5
West Bengal	-2.05	-4	-2.93	2	-1.27	-6	-1.92	-11

Uttar Pradesh (-3.93), Himachal Pradesh (-3.52), Punjab (-3.45) and Orissa (-3.20). It may be observed that a steep decline in growth rates was shared by well-developed states like Punjab and Haryana as well as relatively less developed states, but the less developed states were affected much more. The initial impact of reform process thus affected adversely the less developed states generally much more than in case of the more developed states. It may be noted that Montek S. Ahluwalia's (2000) results differ somewhat from these. This is presumably a consequence of his covering a longer period up to 1997-98, inclusion of 14 states as against 16 covered here and using 1990-91 as terminal year for first period but 1991-92, as the base year for the subsequent period.

When we look at change in ranks in terms of overall growth rates, if we ignore rank changes up to 3, the steepest deterioration took place in case of Haryana (-10) and Rajasthan (-10), followed by that in case of Uttar Pradesh (-5), Himachal Pradesh (-5) and Bihar (-4). At the other end of scale Kerala improved its rank position by 11, followed by Gujarat (8), Assam (5), Madhya Pradesh (4) and West Bengal (4).

The change in rank of sectoral growth rates was broadly in conformity with rank change for overall growth. But in a few cases, change in sectoral growth ranking differed visibly from the overall rank change. States where there were marked deviations were:

1. In case of Gujarat whereas the overall growth rate rank improved by 8, for tertiary sector it was only 1.
2. In Himachal Pradesh, while overall growth rate rank deteriorated by 5 positions, in case of secondary sector growth, there was improvement of 9 positions.
3. In case of Kerala, whereas overall growth rank improved by 11 positions, in case of the primary sector, although there was improvement in rank, it was only of the order of 6 positions.
4. In case of Madhya Pradesh, overall growth rank improved by 4 positions, but that in case of primary sector growth it improved by 10 positions while in case of tertiary sector growth it deteriorated by two positions, thus revealing divergent sectoral trends.
5. Rajasthan's overall growth rank deteriorated by 10 positions, but in the secondary sector growth some cushion seems to have operated since the rank decline was only 1.
6. In Uttar Pradesh overall growth rate decline was 5 but in the secondary sector the decline was 11.
7. West Bengal depicted reverse type of situation since its overall growth rank improved by 4 but in tertiary sector growth the improvement was by eleven. On the other hand, its primary sector growth rank, which was at the top (1) during the eighties declined by 2 to yield 3<sup>rd</sup> rank during 1991-96.

## V Impact on Regional Development: Levels, Ranks and Relatives

What has been the impact of growth on the levels of regional development? This is the theme to which this section is addressed. The level of economic development of different states is taken to be measured in terms of state domestic product (SDP) per-capita, which in brief shall be referred to as income per-capita. At first changes in it during the period 1951–1981 are presented (Table 7). These results are based on an earlier study by the present writer (1994). The estimates for 1950–51 and 1980–81 are based on data at 1960–61 prices and 1970–71 prices, respectively.

As may be observed, the top four states in 1950–51 consisted of West Bengal (1), Punjab (2), Gujarat (3) and Maharashtra (4) while the bottom four were Bihar (16), Orissa (15), Madhya Pradesh (14) and Uttar Pradesh (13). By 1980–81 there were only two visible changes in ranks and both of these were in the direction of deterioration. These were slide down in the position of West Bengal and Uttar Pradesh, both of which lost their position by four ranks. In case of West Bengal the slide-down was of course at a much higher level of development than in the case of Uttar Pradesh. The decline in the case of West Bengal was to a considerable extent a consequence of its industrial decline, which started with the 'Gherao' movement of nineteen sixties.

When comparing the levels of development of 1980–81 and 1995–96 on the basis of per-capita income at 1980–81 prices (Table 8), it may again be observed that there was very little change over the period in terms of ranks of top four and bottom four states, the top four being Punjab, Maharashtra, Haryana and Gujarat in 1980–81. In 1995–96 the top four were again the same, the only difference being that Punjab and Maharashtra had switched places. Similarly in case of the lowest ranking states there was only slight shift of ranks.

The absolute magnitude of change in per-capita incomes between 1980–81 and 1995–96 and their ranks, have been given in Table 9. The change has been measured as 1995–96 minus 1980–81 income per-capita. Thus, a positive change indicates an increase in per-capita income and vice-versa. As may be observed, the maximum increase over this period took place in case of Maharashtra, followed by that in case of Gujarat, Punjab, Tamil Nadu and Haryana, all of which are the developed states and occupied top five ranks in 1995–96. In 1980–81 also this ranking was broadly true except that Tamil Nadu occupied the 9<sup>th</sup> rank. At the other end of the scale are Bihar, Assam, Orissa, Uttar Pradesh and Madhya Pradesh, in whose case income change was the least. All of these belong to the less developed category and four of these fall within the 'BIMARU' category. Thus relative improvement in overall developmental level has been the fate of the better off while decline or meagre improvement has fallen to the share of those lagging.

Table 7: State per-capita Incomes and their Ranks

States		1950-51 at 60-61 prices NCAER	1960-61 at 60-61 prices NCAER	1970-71 at 70-71 prices SSB <sup>N</sup>	1980-81 at 70-71 prices SSB
Andhra Pradesh		258	289	585	647
	Rank	11	13	10	8
Assam		335	428	535	558
	Rank	6	7	13	12
Bihar		181	222	402	441
	Rank	17	15	17	17
Gujarat		381	403	829	904
	Rank	3	4	3	4
Haryana		364	396	877	1060
	Rank	5	5	2	2
Himachal Pradesh		270	295	651	711
	Rank	10	10	6	6
Jammu and Kashmir		227	248	548	642
	Rank	16	16	12	10
Karnataka		287	313	641	687
	Rank	8	9	8	7
Kerala		304	326	594	621
	Rank	7	8	9	9
Madhya Pradesh		236	293	484	517
	Rank	15	11	16	15
Maharashtra		373	480	783	957
	Rank	4	2	4	3
Orissa		252	268	485	477
	Rank	13	15	15	16
Punjab		444	485	1070	1354
	Rank	2	1	1	1
Rajasthan		256	272	645	537
	Rank	12	14	7	13
Tamil Nadu		245	344	581	584
	Rank	14	6	11	11
Uttar Pradesh		271	292	486	519
	Rank	9	12	14	14
West Bengal		471	462	722	793
	Rank	1	3	5	5

Note: Estimates of per-capita income of Himachal Pradesh, Jammu and Kashmir, Haryana and Punjab for 1950-51 and 1960-61 have been derived by assuming that the same relative distance existed between them in 1950-51 and 1960-61, as in 1970-71. Admittedly, estimates for these States for the first two periods are less reliable. Assumptions also had to be made for estimating figures for 1989-90 in respect of Madhya Pradesh, for which data are available only at 1970-71 prices, and for four States for which 1989-90 data were not available.

Source: Ashok Mathur (1994)

Table 8: Per Capita Incomes and Ranks in 1981 and 1996

<i>States</i>	<i>1980-81</i>	<i>Rank</i>	<i>1995-96</i>	<i>Rank</i>
Andhra Pradesh	1379.87	10	2407.02	9
Assam	1284.47	13	1601.98	15
Bihar	916.96	16	983.40	16
Gujarat	1939.75	4	3516.75	4
Haryana	2370.10	3	3679.06	3
Himachal	1703.56	6	2518.17	8
Karnataka	1520.36	7	2558.37	7
Kerala	1507.56	8	2200.05	10
Madhya Pradesh	1357.55	11	1854.20	12
Maharashtra	2435.25	2	4635.13	1
Orissa	1313.50	12	1633.81	14
Punjab	2674.15	1	4176.13	2
Rajasthan	1221.67	15	1973.76	11
Tamil Nadu	1498.04	9	2819.66	5
Uttar Pradesh	1277.55	14	1654.34	13
West Bengal	1773.38	5	2703.67	6

Table 9: Per Capita Overall and Sectoral Income Change (1996-1981)

<i>States</i>	<i>NSDP</i>	<i>Rank</i>	<i>Primary</i>	<i>Rank</i>	<i>Secondary</i>	<i>Rank</i>	<i>Tertiary</i>	<i>Rank</i>
Andhra Pradesh	1027.15	-7	125.77	-9	340.54	-6	560.83	-6
Assam	317.52	-15	-14.08	-13	40.03	-16	291.57	-11
Bihar	66.44	-16	-121.94	-16	80.08	-15	108.29	-16
Gujarat	1577.00	-2	-110.38	-15	959.84	-1	727.54	-3
Haryana	1308.96	-5	223.38	-4	460.21	-4	625.37	-4
Himachal Pradesh	814.61	-9	58.57	-10	319.36	-7	436.68	-8
Karnataka	1038.01	-6	163.37	-6	288.18	-8	586.46	-5
Kerala	692.48	-11	127.98	-8	156.37	-12	408.13	-9
Madhya Pradesh	496.65	-12	57.87	-11	186.24	-10	252.54	-14
Maharashtra	2199.88	-1	150.02	-7	802.83	-2	1247.03	-1
Orissa	320.31	-14	-41.66	-14	92.90	-14	269.06	-13
Punjab	1501.98	-3	548.79	-1	608.03	-3	345.15	-10
Rajasthan	752.08	-10	243.56	-3	235.59	-9	272.94	-12
Tamil Nadu	1321.62	-4	181.56	-5	405.33	-5	734.73	-2
Uttar Pradesh	376.78	-13	28.84	-12	122.02	-13	225.93	-15
West Bengal	930.29	-8	286.09	-2	178.69	-11	465.51	-7

When one looks at the scenario in terms of sectoral per-capita income change, one is struck by the fact that whereas secondary and tertiary sector, as well as overall per-capita incomes recorded an increase in case of all states over the period 1981-96, in case of per-capita primary income there was a decline in case of four states (Assam, Bihar, Orissa and Gujarat). However, the relative per-capita sectoral change has by and large been in conformity with overall per-capita income change, as may be observed from Table 8. The ranks of sectoral income change are generally 2-3 or at the most 4 places away from that of overall per-capita income change. But in case of a few states there has been visible divergence between performance of certain sectors and the overall per-capita income change. States where there have been such noticeable deviations are discussed below.

1. In case of Gujarat, whereas overall per-capita income change is among the highest, per-capita primary sector income change is second from the bottom. In fact, in case of Gujarat there was a decline in per-capita primary income, as mentioned shortly back. Thus, agricultural performance has been a weak spot amidst commendable overall economic performance in case of Gujarat.
2. Similarly in case of Maharashtra as well, amidst overall and secondary as well as tertiary sector economic performance of a top-level magnitude, primary sector per-capita income change falls in the middle category. It has, however, not been as disturbing a picture as in the case of Gujarat's primary sector.
3. In case of Punjab whereas overall as well as primary and secondary sector per-capita income change were among the top three, in case of tertiary sector incomes the change has been of 10<sup>th</sup> rank.
4. The case of Rajasthan was of the reverse type. Its overall, secondary and tertiary per-capita income changes were relatively poor, their ranking belonging to the lower middle category. But in terms of its primary sector income change, its position was third from the top, reflecting essentially a resurgence in its agricultural growth.
5. West Bengal presents a picture of sectoral contrasts. Whereas, its overall and tertiary income increase belonged to middle category, in terms of its primary sector income increase it was second from the top reflecting very commendable agricultural performance during the eighties. On the other hand, per-capita secondary income increase was very poor, occupying 11<sup>th</sup> rank.

Development ranks in terms of per-capita income hide the exact magnitude of difference between incomes of different states. Moreover, they do not allow one to observe a state in relation to overall development of the country. In order to overcome these limitations, we have estimated state income relatives (See K. R. G. Nair, 1982) for the four quinquennial points of time during eighties and nineties (Table 10). Here state per-capita incomes have been expressed as a percentage of the all-India average, both for overall state income as well as sectoral per-capita

incomes. A value more than 100 indicates states which are more developed than the country as a whole and vice-versa.

As may be observed from Table 10, last row, whether one considers overall or sectoral development, the number of states above the country average is much less than those below it. In terms of overall per-capita income, 4-6 states belong to the above average against 10-12 below it. By and large a similar position exists in respect of the sectors, except that in case of tertiary sector the number of 'above average states' has increased progressively from 6 to 8.

If one tries to categorize states according to whether their index value has risen, fallen or fluctuated, it may be noted that:

1. Only 5 states have shown a continuous or almost continuous rise in their index. This group includes Andhra, Gujarat, Karnataka, Maharashtra and Tamil Nadu.
2. In contrast, those, which have shown by and large a continuous decline in their overall index, are Bihar, Madhya Pradesh, Orissa and Uttar Pradesh, which have formed almost a perennial backward group.
3. The remaining seven states (Assam, Haryana, Himachal, Kerala, Punjab, Rajasthan, West Bengal) have shown fluctuations in the value of their index, which in some cases have been small fluctuations while in others fluctuations have been quite wide as in Haryana, Punjab and Rajasthan.

**Table 10: State Per-Capita Income Relatives**

State	Part A: Primary Sector Relatives				Part B: Secondary Sector Relatives			
	1986-81	1985-86	1996-91	1995-96	1986-81	1985-86	1996-91	1995-96
Andhra Pradesh	88.61	88.42	87.22	92.41	59.25	64.89	79.24	79.25
Assam	94.41	94.79	83.93	80.66	38.32	40.95	29.89	26.19
Bihar	69.76	72.69	68.32	46.20	41.10	52.78	47.60	33.25
Gujarat	109.04	91.30	89.26	81.85	136.59	162.20	157.61	207.00
Haryana	178.27	191.15	196.36	182.35	116.26	146.09	141.97	126.57
Himachal	118.16	108.19	112.05	110.11	95.42	84.81	88.33	95.76
Karnataka	96.46	90.02	86.86	103.78	81.60	79.68	83.65	83.99
Kerala	81.47	74.58	79.98	86.45	94.96	79.09	74.86	72.85
Madhya Pradesh	104.03	103.52	100.71	97.70	64.43	51.63	61.02	60.57
Maharashtra	94.28	83.93	96.64	100.27	220.90	212.47	209.79	230.53
Orissa	100.12	106.03	73.35	82.33	52.44	46.05	45.55	41.14
Punjab	182.36	224.06	220.66	225.02	127.70	145.61	144.94	153.28
Rajasthan	87.95	90.73	115.67	105.99	56.94	57.27	61.81	63.40
Tamil Nadu	53.48	61.07	64.13	68.47	129.68	126.48	127.64	126.15
Uttar Pradesh	92.06	88.68	87.54	83.77	50.61	55.20	56.37	44.21
West Bengal	79.64	86.87	82.16	103.85	134.23	114.63	101.01	97.08
States >A-I	6	5	5	6	6	6	6	5
States <A-I	10	11	11	10	10	10	10	11

State	Part C: Tertiary Sector Relatives				Part D: Per Capita Income (NSDP) Relatives			
	1986-87	1985-86	1996-97	1995-96	1986-87	1985-86	1996-97	1995-96
Andhra Pradesh	90.39	92.92	103.02	100.08	82.42	84.41	91.20	91.92
Assam	80.32	92.47	79.45	69.56	76.72	81.05	68.34	61.18
Bihar	44.81	44.30	42.08	33.71	54.77	57.63	52.99	37.56
Gujarat	110.41	116.23	115.70	126.22	115.87	117.32	116.90	134.30
Haryana	111.56	121.86	125.39	117.26	141.57	155.24	155.31	140.50
Himachal	84.92	88.85	94.35	85.57	101.76	95.58	99.20	96.17
Karnataka	89.86	91.93	97.88	102.20	90.81	88.24	90.24	97.70
Kerala	97.76	88.98	84.42	89.65	90.05	80.88	80.36	84.02
Madhya Pradesh	62.91	60.84	60.24	56.74	81.09	75.62	75.07	70.81
Maharashtra	159.66	167.96	171.33	200.80	145.46	145.18	154.20	177.01
Orissa	68.38	66.62	60.30	61.17	78.46	77.38	61.23	62.39
Punjab	152.55	138.80	126.00	112.56	159.73	174.36	165.09	159.48
Rajasthan	64.66	60.61	74.10	59.57	72.97	71.80	85.98	75.38
Tamil Nadu	108.34	115.60	112.82	125.81	89.48	96.50	99.02	107.68
Uttar Pradesh	73.66	69.74	70.75	59.90	76.31	73.79	73.13	63.18
West Bengal	120.42	114.47	102.96	106.94	105.93	103.53	94.94	103.25
States > A-I	6	6	7	8	6	5	4	6
States < A-I	10	10	9	8	10	11	12	10

## VI Impact on Regional Income Disparities

Having examined the level of state per-capita incomes in the previous section, this section focuses on inter-temporal behaviour of disparity among the states in terms of their per-capita income levels. Theoretical models dealing with this theme have provided divergent conclusions. The neo-classical models developed along the lines of Solow's work postulate a long-term trend towards income convergence among the spatial units. Neo-classical theoretical expectations lead to this conclusion within the framework of factor mobility among the spatial units as well as without inter-spatial factor mobility. The latter conclusion emerges from application of the Heckscher-Ohlin theorem to inter-regional framework. In contrast to the neo-classical formulation, dissident views emerging from the works of Gunnar Myrdal, Raul Prebisch and Andre Gunder Frank postulate primarily divergence among regions during the process of development of the developing regions. The third brand of formulations and their empirical verification lead one to expect a divergence among regions up to some stage of development but an ultimate trend towards convergence, resulting in an inverted U-shaped curve of regional disparities. Albert Hirschman's work and empirical study of J. G. Williamson belong essentially to this category.

There have been a large number of studies of this theme for the Indian economy. An overview of some of the major studies up to the eighties was provided in K. R. G. Nair's Survey of Regional Economics for the ICSSR (1994). Present author's two earlier studies (1983 and 1994) on this theme as also some

of the other works indicated that in the initial phase of post-independence development, there was some evidence to suggest a tendency towards narrowing down of regional income disparities. But since mid-sixties, particularly in the wake of the Green Revolution, disparities had started mounting. This trend has continued unabated.

The inter-regional behaviour of regional income disparities can be viewed from two perspectives. One of these is to examine the time trend of some measure of regional income differentials. In this section disparities have been measured in terms of the coefficient of variation of state level per-capita incomes. The second approach is to consider state-wise growth over a certain period of time in relation to the initial per-capita income of those states at the beginning of that period of time. In case the higher income states, (more developed), systematically reveal a higher pace of growth and vice-versa, it obviously implies an "income widening" tendency among the states. A negative correlation between these two variables, on the other hand, indicates income convergence tendency. These are essentially parallel to what has been called by Barro, Xavier Salai-Martin (1995) and Quah (1996) as  $\beta$  and  $\sigma$  convergence.

### (A) Coefficient of variation test

We may first turn to inter-temporal behaviour of coefficient of variation (CV) of state level per-capita incomes or to be more precise per-capita SDP. Table 11, which is taken from present author's earlier paper (1994), presents weighted CV from 1950-51 to 1980-81. Estimates of CV (un-weighted) for the period 1981-96, based on state level SDP data at 1980-81 prices, brought together by C.S.O. from various State Statistical Bureau estimates, are given in Table 11. As may be seen, CV showed a tendency towards decline till mid-sixties but thereafter there has been almost a continuous increase. It is this type of behaviour, which had prompted the present writer to conjecture in his earlier article (1983) that the Indian experience appeared to suggest movement along a U-shaped curve of regional disparities rather than an inverted U-shaped one.

**Table 11: Spatial Variability of Inter-State Per Capita Incomes (SDP)  
Estimates of Weighted Coefficient of Variation (C.V.)**

<i>Year</i>	<i>C.V at 1960-61 Prices</i>	<i>Based on</i>
1950-51	26.7	NCAER data
1955-56	23.5	NCAER data
1960-61	24.2	NCAER data
1964-65	19.6	CSO data
1965-66	24.6	SSB data
1970-71	24.7	SSB data
1975-76	27.2	SSB data
1980-81	30.2	SSB data

*Source:* Ashok Mathur (1994)

In order to delve into factors operating behind this contrary path of movement, movements in sectoral per-capita income disparities for the period 1951-76 had been examined in the earlier study by the present author (1983). The analysis suggests an inverted U-shaped curve in case of the primary sector, the rising part primarily coinciding with the inequitable consequences emerging from the new agricultural strategy associated with the onset of the green revolution. In contrast, the secondary sector regional disparities revealed some tendency towards a decline of per-capita income disparities. Tertiary sector per-capita income disparities, on the other hand followed a path somewhat similar to that of the primary sector regional disparities.

**Table 12: Coefficients of Variation of Overall and Sector Income Per-Capita (1980-81 to 1995-96)**

<i>Period</i>	<i>Overall</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>
1980-81	29.98	33.55	51.92	33.09
1985-86	33.54	41.37	53.23	33.75
1990-91	34.74	42.55	52.15	33.47
1995-96	39.43	41.74	61.90	42.22

For extending the sectoral analysis of regional disparities into the more recent period, Table 12 gives quinquennial estimates of sectoral coefficients of variation from 1980-81 to 1995-96, all based on SDP data at 1980-81 prices. What emerges from this table is a perceptible deviation from the earlier sectoral regional disparities trend. The rising primary sector regional disparities show some tendency to get arrested, to a considerable extent a consequence of much improved agricultural performance of the agriculturally lagging Rajasthan and West Bengal. But the secondary and tertiary sector disparities show a disturbing trend after the eighties. Between 1990/91 and 1995-96 there was a substantial rise in the coefficient of variation of the secondary and tertiary sectors from 52.15% to 61.90% and from 33.47% to 42.22%. There is therefore indication that in the post-reform period industrial investments have tended to move in the direction of the better-developed regions, shying away from the less developed ones. Service sector incomes have followed the direction of secondary sector growth, as normally one would expect.

## **(B) Correlation test**

In order to examine as to what degree the above tendency is borne out in terms of the second mode of assessing the pattern of movement of regional disparities, we may now turn to correlation of overall and sectoral rates of growth with the initial levels of state per-capita income. For this purpose state-wise compound rates of growth of SDP and sectoral incomes which were discussed for the fifteen

year period of eighties and first half of nineties in section II (b), have been correlated with the initial per capita income existing in 1980–81 (see Section IV). In addition, in order to view the scenario separately for the eighties and nineties, state-wise compound growth rates were estimated separately for the periods 1980–81/82–83 to 1989–90/91–92 and 1989–90/91–92 to 1993–94/95–96. These growth rates were correlated with respective state-wise per capita incomes of 1980–81 and 1990–91. The resulting correlations for the overall economy and each of the three sectors for 1981–96, 1981–91 and 1991–96 are presented in Table 13.

**Table 13: Coefficients of Correlation of Growth with Initial Per-Capita Income**

<i>Period</i>	<i>Overall</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>
1981–96	0.49	0.16	0.20	0.10
1981–91	0.40	0.19	-0.03	-0.10
1991–96	0.41	0.10	0.57	0.61

As may be observed from Table 13, for the composite period 1981–96 the correlation for the overall economy is +0.49, which indicates an income-widening tendency. The value of correlation coefficient, though positive and fairly high, is a little bit below 10 per cent significance level since the number of observations in terms of the states included for analysis (16) is not very large. But it does broadly corroborate the finding of an increase in overall regional income disparity in terms of the coefficient of variation criterion. However, when one looks at the sectoral correlations, though all the three correlations are positive, they are very poor and too low either to confirm or contradict the conclusions based on coefficient of variation.

By and large similar conclusions emerge in respect of correlations for the eighties (1980/81 to 1990/91). However, when one comes to the post-reform period of 1991–96, the results are rather revealing. Although the overall economy correlation is +0.41, but those for the secondary and tertiary sector reveal significant positive correlation values. In case of these two sectors during 1991–96 both the coefficient of variation test and the correlation coefficient tests lead to identical conclusion of a rise in regional disparities in the industrial and tertiary activities. Thus some of the misgivings concerning the likely adverse impact of reforms on regional disparities in industry appear to have got borne out during the first half of nineties. One would have to wait for fuller results to become available at regional level before being in a position to reach definitive conclusions regarding the whole of the decade of nineties.

**(C) Disparities within state sub-categories**

It would be useful to refer to some interesting results of a 'convergence' hypothesis study by Tushar Kanti Das (1998). In the light of the Tenth Finance Commission's suggestion that states should be categorized into the High Income, Middle Income and Low Income States, the convergence hypothesis has been tested separately for the three groups of states in terms of the  $\beta$  and  $\sigma$  convergence tests. These tests have been applied separately for the period 1960-94 as well as for the sub-periods 1960-65, 1966-82 and 1983-94. A negative  $\beta$  coefficient indicates negative relationship between regional growth over a period of time and the initial levels of per-capita income thus pointing to convergence, while a positive  $\beta$  coefficient shows divergence among the states. Similarly, a decline in  $\sigma$  coefficient indicates convergence tendency and vice-versa. If both  $\beta$  and  $\sigma$  tests indicate convergence, the situation is referred to as that of "Absolute Convergence"; if both indicate divergence, it is called "Absolute Divergence". If  $\sigma$  test reveals divergence but  $\beta$  test indicates convergence, it is referred to as conditional convergence.

**Table 14: Divergence-Convergence among the States**

	1966-94	1960-65	1966-82	1983-94
<i>14 Major States</i>				
<b><math>\beta</math> Coefficient</b>	Positive	Negative	Positive	Positive
<b><math>\sigma</math> Coefficient</b>	Increase	Decrease	Increase	Increase
<b>Overall Trend</b>	Absolute Divergence	Absolute Convergence	Absolute Divergence	Absolute Divergence
<i>High Income States</i>				
<b><math>\beta</math> Coefficient</b>	Negative	Negative	Positive	Positive
<b><math>\sigma</math> Coefficient</b>	Increase	Decrease	Increase	Increase
<b>Overall Trend</b>	Conditional Convergence	Absolute Divergence	Absolute Divergence	Absolute Divergence
<i>Middle Income States</i>				
<b><math>\beta</math> Coefficients</b>	Negative	Negative	Negative	Negative
<b><math>\sigma</math> Coefficients</b>	Decrease	Decrease	Decrease	Increase
<b>Overall Trend</b>	Absolute Convergence	Absolute Convergence	Absolute Convergence	Absolute Convergence
<i>Low Income States</i>				
<b><math>\beta</math> Coefficients</b>	Positive	Negative	Negative	Negative
<b><math>\sigma</math> Coefficients</b>	Increase	Decrease	Increase	Increase
<b>Overall Trend</b>	Absolute Divergence	Absolute Convergence	Conditional Convergence	Conditional Convergence

Source: Tushar Kanti Das (1998)

The high-income states in T.K. Das's study include Punjab, Maharashtra, Haryana and Gujarat; middle category includes Tamil Nadu, Karnataka, West Bengal, Kerala and Andhra Pradesh while the low-income group covers Madhya Pradesh, Rajasthan, Orissa, Uttar Pradesh and Bihar, making up 14 major states. The results for the overall period and three sub-periods for all the states as well as the three sub-categories have been summarized in Table 14. For the 14 states considered together, there is absolute divergence for the period as a whole, as well as for the two major sub-periods, viz. 1966–82 and 1983–94. There was Absolute Convergence only during 1960–65 and that was true of each sub-category of states. This is broadly in conformity with the main conclusions of the two earlier studies of the present author referred to earlier in this paper.

What is of interest to note is that for the middle-income states there was Absolute Convergence for the period as a whole as well as for each sub-period. It is the high-income states as well as low-income states, which displayed either Absolute Divergence or Conditional Convergence during the overall periods and sub-periods except 1960–65. This does underscore the need for policy to incorporate special measures to uplift the sagging pace of development in the lagging regions.

## VII National and Regional Economic Structure

State per-capita income provides only one indicator of State level development, although it can be designated as the most important single indicator of development. Sectoral structure of income can be considered as the second most important indicator of development. In line with the Colin Clark-Kuznets-Fisher hypothesis, with a rise in the level of development the share of non-primary activities generally increases at the cost of primary sector. A decline in the share of primary sector is counterbalanced by a rise in the share of secondary and tertiary activities. As to which of these two sectors is more positively related to development, needs to be assessed.

### (A) All India sectoral change

We may first look at national level sectoral structure and change in it over the five decades from 1950–51 to 1999–2000, the latest year for which sectoral data are available at present. For this purpose the All-India sectoral structure has been estimated from national income data at 1993–94 prices as given in the Economic Survey, 2001 (Appendix Table 1.3, page 5-5). Estimates of the share of primary, secondary and tertiary section as given in Table 15 (A and B) show a substantial decline in the share of primary sector over the five-decade period (–31.96), which is counterbalanced by maximum rise in the share of tertiary sector (+19.83) followed by that of the secondary sector (+11.34), as may be seen from the last row of Table 15(B). The share of primary sector has declined to 27.23 per cent, which is less than half of what it was in 1950–50 (59.19 per cent).

**Table 15: All-India sectoral Structure and Structural Changes (1951–2000)****(A) Sectoral Percentages**

<i>Year</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>
1950–51	59.19	13.29	28.04
1960–61	54.75	16.61	29.02
1970–71	48.12	19.91	32.18
1980–81	41.82	21.59	36.59
1990–91	34.92	24.49	40.59
1999–2000	27.23	24.63	47.87

**(B) Change in Sectoral Percentage:  $S(t) - S(t - 1)$** 

<i>Period</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>
1950/51–1960/61	-4.45	3.32	0.98
1960/61–1970/71	-6.63	3.30	3.16
1970/71–1980/81	-6.30	1.68	4.41
1980/81–1990/91	-6.90	2.90	4.00
1990/91–2000	-7.69	0.14	7.28
1950/51–2000	-31.96	11.34	19.83

Total magnitude of sectoral structural change over the 5-decade period, however, hides considerable decadal variations in the magnitude of sectoral shift in some of the sectors. The magnitude of primary sector decline has risen every decade except for a slight dip from -6.63 in sixties to -6.30 in seventies. In the reverse direction, the magnitude of increase in the share of tertiary sector has gone up in every decade except for a slight decrease in the magnitude of increase from +4.41 in seventies to +4.00 in eighties. In contrast, structural enhancement in the direction of secondary sector has been much less than in the direction of tertiary sector. But in addition, there have been considerable variations in the decadal magnitude of secondary sector shift. There was a major decline in the magnitude of shift from +3.30 in sixties to +1.68 during seventies; but the decline in nineties to +0.14 from +2.90 in eighties has been very phenomenal and disturbing. It is again indicative of weak health of the industrial sector during the nineties to which attention was drawn in the opening section of this paper.

**(B) State level sectoral structure**

We may now look at the state level picture. Table 16 gives the percentage share of primary, secondary and tertiary sectors in NSDP as well as the ranks of states in terms of these three shares for 1980–81 and 1995–96. For the purpose of comparison, rank of the states in terms of per-capita NSDP is also given for 1980–81. As may be observed, there does not exist a very close inverse relationship between the level of development as reflected in per-capita NSDP

Table 16: Sectoral Income Structure (State Level)

## (A) 1980-81 Percentages

<i>States</i>	<i>Primary</i>	<i>Rank</i>	<i>Secondary</i>	<i>Rank</i>	<i>Tertiary</i>	<i>Rank</i>	<i>Per capita Income ranks (1996-91)</i>
Andhra Pradesh	46.62	10	16.61	13	36.77	4	11
Assam	53.36	5	11.54	16	35.10	6	8
Bihar	55.23	3	17.34	12	27.43	14	16
Gujarat	40.81	12	27.24	4	31.95	10	4
Haryana	54.60	4	18.98	8	26.42	15	2
Himachal	50.35	8	21.67	6	27.98	13	3
Karnataka	46.06	11	20.76	7	33.18	7	7
Kerala	39.23	13	24.37	5	36.40	5	13
Madhya Pradesh	55.63	1	18.36	10	26.01	16	5
Maharashtra	28.10	15	35.09	1	36.80	3	9
Orissa	55.33	2	15.45	14	29.22	12	6
Punjab	49.50	9	18.47	9	32.02	9	1
Rajasthan	52.26	7	18.03	11	29.71	11	12
Tamil Nadu	25.92	16	33.49	2	40.60	1	15
Uttar Pradesh	52.31	6	15.33	15	32.36	8	10
West Bengal	32.60	14	29.28	3	38.12	2	14

## (B) 1995-96 Percentages

<i>States</i>	<i>Primary</i>	<i>Rank</i>	<i>Secondary</i>	<i>Rank</i>	<i>Tertiary</i>	<i>Rank</i>
Andhra Pradesh	31.95	13	23.67	10	44.38	4
Assam	41.90	6	11.75	16	46.35	2
Bihar	39.10	8	24.31	8	36.59	11
Gujarat	19.37	15	42.32	1	38.31	10
Haryana	41.25	7	24.73	7	34.02	13
Himachal	36.39	9	27.34	4	36.27	12
Karnataka	33.76	10	23.60	11	42.64	6
Kerala	32.70	11	23.81	9	43.49	5
Madhya Pradesh	43.85	3	23.49	12	32.66	14
Maharashtra	18.00	16	35.76	2	46.24	3
Orissa	41.93	5	18.10	15	39.96	8
Punjab	44.84	1	26.39	5	28.77	16
Rajasthan	44.69	2	23.10	13	32.22	15
Tamil Nadu	20.21	14	32.17	3	47.63	1
Uttar Pradesh	42.14	4	19.21	14	38.65	9
West Bengal	31.96	12	25.82	6	42.22	7

**Table 17: Correlation of State Sectoral Structure and Per-Capita Income**

Sector	Value of Correlation Coefficients		
	1980-81	1990-91	1995-96
Primary	-0.33	-0.24	-0.49
Secondary	0.42	0.49	0.67
Tertiary	0.09	-0.17	-0.03

and ranks of primary sector share. Similarly, although there appears to be a broad positive relationship between ranking of per-capita incomes and that of the share of other two sectors, it is not a very perfect positive one. In order to examine whether a rise in the level of development as reflected in per-capita income is more closely related to the share of secondary or tertiary sector or decline in the share of primary sector, these three shares have been correlated with the level of per-capita income for three points of time (1981, 1991 and 1996). The value of correlation coefficients is summarized in Table 17.

A look at correlation coefficients shows that it is industry based secondary sector, which is much more closely related in a positive direction to per capita income than the tertiary sector. Similarly, the positive correlation of secondary sector is stronger than the negative correlation of the primary sector activities. In fact the relationship with tertiary sector is not only much more feeble but erratic as well as being mildly negative in 1991 and 1996. On the other hand, the positive relationship with secondary sector has been gaining in strength over the years, the correlation coefficient values having risen from +0.42 in 1981 to +0.67 in 1996. The latter value is significant at 0.01 level. It appears therefore that despite the fact that improvements in overall growth of the economy have come about mainly as a consequence of growth in the tertiary sector incomes, the kingpin of development continues to be the industry based secondary sector activities.

### (C) State level sectoral structural change

Share of the different sectors in SDP conveys only a static picture of sectoral structure of the regional economies. An equally important facet is to obtain the dynamic picture by examining the magnitude of structural change in different economies and to see whether structural change bears any systematic relationship to either the pace of growth or the level of development of different regional economies.

For this purpose, Table 18 gives the magnitude of structural change from 1980-81 to 1995-96 in terms of the share of each of the three sectors in 1996 minus the share in 1981, i.e.,

Table 18: State-wise Change in Sectoral Percentages (1996-1981)

States	Primary	Rank	Secondary	Rank	Tertiary	Rank
Andhra Pradesh	-14.67	14	7.06	3	7.61	7
Assam	-11.45	8	0.21	13	11.24	1
Bihar	-16.13	15	6.97	4	9.16	5
Gujarat	-21.44	16	15.08	1	6.36	12
Haryana	-13.35	11	5.76	5	7.60	8
Himachal	-13.96	13	5.67	6	8.29	6
Karnataka	-12.30	10	2.84	10	9.46	3
Kerala	-6.53	4	-0.56	14	7.09	9
Madhya Pradesh	-11.78	9	5.13	7	6.65	11
Maharashtra	-10.10	6	0.67	12	9.44	4
Orissa	-13.40	12	2.66	11	10.74	2
Punjab	-4.66	2	7.92	2	-3.25	16
Rajasthan	-7.57	5	5.07	8	2.51	15
Tamil Nadu	-5.71	3	-1.32	15	7.03	10
Uttar Pradesh	-10.17	7	3.88	9	6.29	13
West Bengal	-0.64	1	-3.47	16	4.10	14

$$R(i) = R(i)_{96} - R(i)_{81}$$

where,  $i$  = Primary, Secondary and Tertiary sectors.  $R$  indicates a sector's percentage share in NSDP.

As may be observed from Table 18, the share of primary sector decline during 1981 and 1996 was the maximum in Gujarat, followed by Bihar, Andhra Pradesh, Himachal, Orissa, Haryana and Karnataka. The counterbalancing rise in the share of secondary sector was the maximum in Gujarat, followed by that in Punjab, Andhra Pradesh, Bihar, Haryana, Madhya Pradesh and Rajasthan.

When one comes to the tertiary sector, the maximum shift towards this sector occurred in Assam, whose secondary sector change in rank was among the lowest at 13, which is rather intriguing. The second largest change in the tertiary sector was that in case of Orissa, followed by Karnataka, Maharashtra and Bihar. When we look at the other end of the scale, the slowest pace of shift towards the secondary sector was in West Bengal followed by Tamil Nadu, Kerala, Assam and Maharashtra. It may thus be seen that it is not always in the more developed states that the shift towards secondary or tertiary sector has been substantial. For example, it was found to be high in Bihar, in Assam and Orissa in respect of the tertiary sector and in the medium high range in respect of the secondary sector in case of Madhya Pradesh and Rajasthan. On the other hand, in some of the advanced states like West Bengal and Tamil Nadu, secondary sector structural change has in fact been negative. It was very low even in Maharashtra. Similarly, in Gujarat and Tamil Nadu, tertiary sector change was

very low. Thus the relationship between the extent of structural change does not appear to be very systematically related to the level of development.

In order to assess the strength of relationship between structural change and the level of development, Table 19 gives values of correlation between per-capita income in 1980–81 and structural change during 1981–91, while Table 19(B) gives correlation between per-capita Income in 1990–91 and structural change during post-reform period 1991–96. As conjectured in the previous paragraph, the correlation values are rather poor. In eighties the maximum strength of relationship existed in the tertiary sector ( $r = -0.38$ ) and that was also the reverse of expected direction. During 1991–96 the relationship in tertiary sector was again negative, but in the secondary sector it was in the expected positive direction and highest. However, the positive value was only  $+0.31$ , which is significant only at about 25 per cent level.

**Table 19: Correlation of State-wise Structural Change with Initial Per-Capita Income**

<i>Period</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>
1981–96	0.18	0.14	0.44
1981–91	0.28	0.01	0.38
1991–96	-0.18	0.31	-0.2

Similarly, the correlation between state level growth rates and structural change during 1981–91 was studied. The results are reported in Table 20. As in the case of relationship of structural change to the level of development, these relationship are even more feeble and not always in the expected direction.

**Table 20: Correlation Between State-wise Growth Rates and Initial Per-Capita Income**

<i>Period</i>	<i>Primary</i>	<i>Secondary</i>	<i>Tertiary</i>
1981–91	0.10	0.08	-0.22

## VIII Which sector has been the 'Engine of Growth'?

Having examined sectoral levels of development and pace of growth, both in the national and regional context, can some sector be considered to have been the kingpin in the process of growth in the Indian economy? This was among the main issues examined as a part of the Kaldorian Growth Laws (See Kaldor,

1966 and 1973; Thirlwall, 1983). Kaldor considered this issue in the context of growth in mature capitalist economies and came to the conclusion that growth of the industrial sector acted as the 'engine of growth'. Could the same be true for a developing economy, which in the present context is the Indian economy?

Kaldorian postulate can be considered as resting upon a few propositions. Among these, one is the high correlation between the rates of growth of Industrial sector and of overall economic growth observed in case of the industrially advanced countries, considered by Kaldor as also by other scholars. Since in advanced capitalist economies industrial output forms a major component of domestic output, correlation between growth of the secondary sector and overall output growth is bound to be high. Caution about this correlation has also been expressed by Gomulka (1983) and McCombie and John R. de Ridder (1983). For that very reason, in the developing countries since it is the primary sector, which forms the dominant component of national output, one would expect a high correlation to exist between growth of the primary sector and overall rate of economic growth. But it raises the question that in case this expectation is empirically borne out, could we assign the role of "engine of growth" to the primary sector in case of developing countries?

In the light of the above-mentioned limitation, there is another channel through which industrial growth could be viewed as being related to overall growth. The channel we have in mind here is the input-output linkages of the secondary sector—both of the forward and backward type (*see* Hirschman, 1958)—with the primary and tertiary sectors and through these the influence of secondary sector growth on the overall growth rate. A good bit of the tertiary sector income is generated through the input of its services in the industrial sector though a part of the services also get utilised in primary sector production and within the tertiary sector itself. On the other side, with the process of development, a rising volume of secondary sector output finds its outlet in the primary sector in the form of inputs like fertilisers, electricity, improved agricultural implements, other capital goods like tractors and manufactured consumer goods. As to how important this third channel is in explaining the relationship of overall economic growth and secondary sector growth, can be revealed only by empirical analysis of the relationship of secondary sector growth rate with rates of growth of the primary and tertiary sector incomes.

It is with this perspective that we now turn to empirical analysis of the Kaldorian postulate in context of the Indian economy. Inter-sectoral growth relationships have been analysed from two angles—first with the help of time series analysis at the all-India level covering a span of nearly five decades (1950–51 to 1998–99) and then through cross-sectional growth analysis using regional data of major Indian states. Empirical estimates have been derived separately for the period up to and beyond 1980–81, using C.S.O. (1979 and 1984) and the Economic Survey (1998 and 2000) data. Results up to 1980–81, along these lines have been obtained by the present writer in another paper (*see* Mathur, 2001), whereas for the period 1981–96 they have been estimated here.

**(A) National level inter-temporal analysis**

First let us look at the national level correlations between annual growth rates of income generated in each of the three sectors with annual growth rates of aggregate domestic product (Table 21). The correlation of growth of secondary sector with that of aggregate domestic output is positive, statistically significant, and free of auto-correlation at 1 per cent level of significance for the period 1951–81, thus reaffirming Kaldor's results obtained for advanced industrial countries. But what is important to note is that the correlation coefficients of both other sectors are higher than that of the secondary sector, thus confirming the doubt that these correlations may essentially be a reflection of the weight occupied by each of the three sectors in national output. The highest correlation during 1951–81 emerges in the case of the primary sector, which accounted for about 50 per cent of the national output. The proportional output contributed by the secondary sector during much of this period had been the least at about 20 per cent, and so also is its correlation coefficient (+0.42), though it is statistically significant.

**Table 21: Regression of Aggregate Growth on Sectoral Growth**

<b>(A): 1950–51 to 1980–81</b>		
Primary Sector	$g_y = 2.20 + 0.54^{***} g_p$ (20.70)	$r = 0.97^{***}$ DW= 1.53
Secondary Sector	$g_y = 1.33 + 0.43^{***} g_s$ (2.44)	$r = 0.42^{***}$ DW= 2.66
Tertiary Sector	$g_y = -2.34 + 1.19^{***} g_t$ (3.06)	$r = 0.50^{***}$ DW= 2.50
<b>(B): 1980–81 to 1998–99</b>		
Primary Sector	$g_y = 4.51 + 0.36^{***} g_p$ (5.17)	$r = +0.79^{***}$ DW= 1.19
Secondary Sector	$g_y = 2.22 + 0.52^{***} g_s$ (4.39)	$r = 0.74^{***}$ DW= 2.43
Tertiary Sector	$g_y = 2.32 + 0.49 g_t$ (1.47)	$r = +0.34$ DW= 2.46
<b>(C): 1950–51 to 1998–99</b>		
Primary Sector	$g_y = 3.03 + 0.48^{***} g_p$ (13.37)	$r = 0.89^{***}$ DW= 1.09
Secondary Sector	$g_y = 1.16 + 0.56^{***} g_s$ (4.88)	$r = +0.58^{***}$ DW= 2.55
Tertiary Sector	$g_y = -0.67 + 0.95^{***} g_t$ (4.54)	$r = +0.56^{***}$ DW= 2.79

$g_y$  is annual rate of growth of net national income  
 $g_p$  is annual rate of growth of primary sector income  
 $g_s$  is annual rate of growth of secondary sector income  
 $g_t$  is annual rate of growth of tertiary sector income  
 $t$  values are given within parenthesis

Results for the period subsequent to 1980, that is 1980–81 to 1998–99, as may be observed from Table 21(B), differ from that for the earlier period in two respects. First, for this period the relationship of secondary sector growth to aggregate growth emerges to be much stronger than what it was during 1951–81. Moreover, the correlation coefficient of secondary sector growth emerges to be higher than that of tertiary sector. These changes are a reflection of growing prominence of industrial sector in India compared to the initial position in which India was a small industrial base economy. Simultaneously, the correlation of primary sector growth to aggregate growth declined from 0.97 during 1951–81 to 0.79. It may, however, be noted that the D.W. value (1.19) for correlation of primary sector growth does not confirm absence of auto-correlation, although it does not fall within the critical range.

The statistical tests reveal that correlation coefficient of each sector is significant and that of the primary sector had an edge over that of the secondary sector during the period 1951–81. But in view of the fact that their hierarchy is basically dependent upon the existing sectoral structure of the economy, particularly for the period 1951–81, on the basis of direct correlations between sectoral growth rates and the overall growth rate it is difficult to designate any one of the three sectors as having been the “engine of growth” or to attribute a higher causal role to either sector in the growth process.

This brings us to the channel of input-output relations among the three sectors, which has been referred to earlier. Here, instead of basing ones conclusions on direct correlations between growth of individual sectors and overall growth, inter-sectoral growth correlations are studied. Two sets of relationships are examined, the first one of which considers secondary sector to be at the apex of growth process and the second one, which visualises primary sector to be in the key role. These correlations are between:

1. Growth of the secondary sector and growth of the primary sector on the one hand, and growth of the secondary sector and growth of the tertiary sector on the other. Since overall growth is nothing but that derived through aggregation of sectoral data, if these two correlations are positive and significant, the role of secondary sector as the “engine of growth” would stand vindicated.
2. Growth of the primary and growth of the secondary sector on the one hand, and growth of the primary and growth of the tertiary sector on the other. If both these correlations are positive and significant, the primary sector could be viewed as playing the key role. If it is possible for (a) and (b) to be simultaneously valid, which would show strong interdependence between all three sectors in the growth process without signifying greater relative importance of one sector over the other in generating growth.

These two sets of relationships based on annual growth rate series are portrayed in diagrams 1(a)–1(b) for 1951–99, 1(c)–1(d) for 1951–1981 and 1(e)–1(f) for 1981–1999. The corresponding regression equations are given in Table 22.

DIAGRAM 1: NATIONAL LEVEL SECTORAL GROWTH RELATIONSHIPS

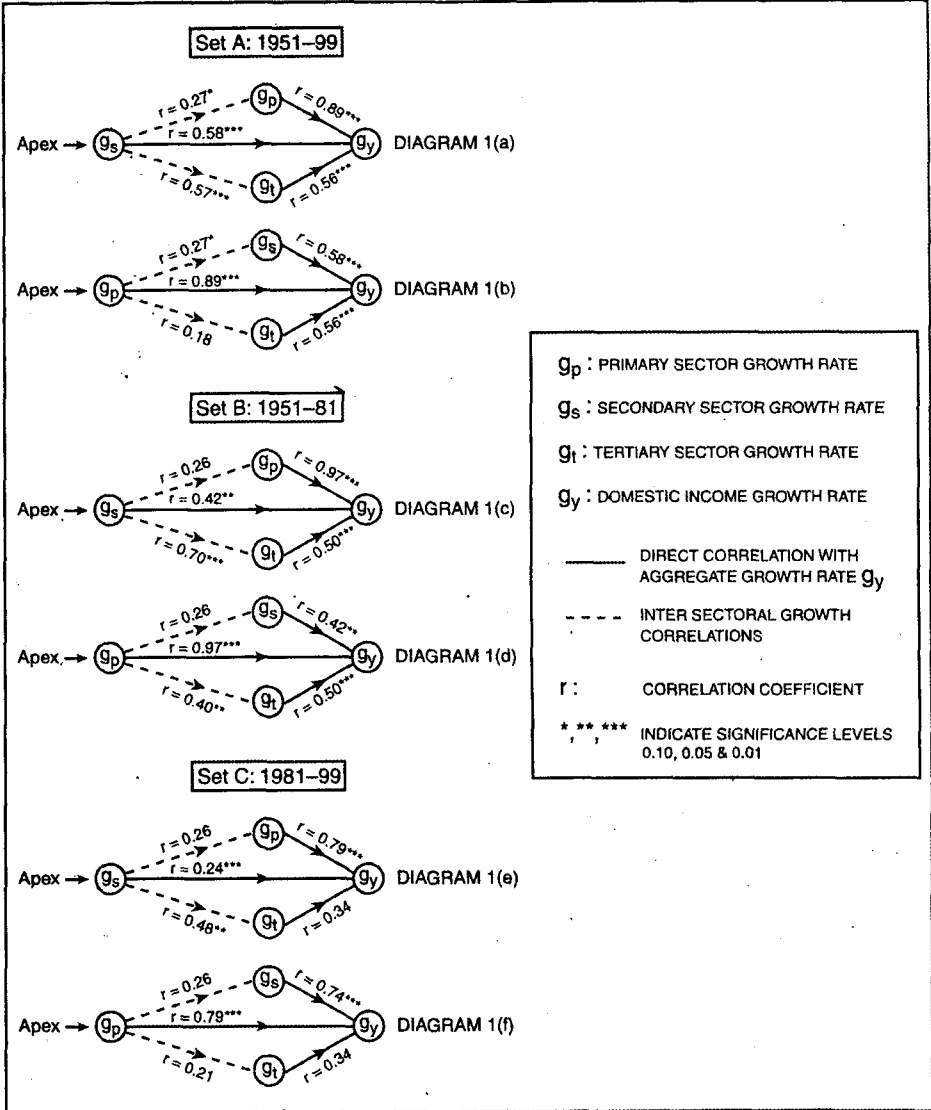


Table 22: Inter-Sectoral Growth Relationships

(A): 1951-1981	
$g_p = -0.11 + 0.50 g_s$ (1.44)	$r = 0.26$ DW = 2.75
$g_s = 3.02 + 0.26^{***} g_p$ (5.23)	$r = 0.70^{***}$ DW = 1.86
$g_s = 4.94 + 0.14 g_p$ (1.44)	$r = 0.26$ DW = 1.43
$g_s = 4.18 + 0.08^{**} g_p$ (2.32)	$r = 0.40^{**}$ DW = 1.19
(B): 1981-1999	
$g_p = 0.68 + 0.40 g_s$ (1.08)	$r = 0.26$ DW = 2.80
$g_s = 0.54 + 0.24^{**} g_p$ (2.17)	$r = 0.48^{**}$ DW = 1.35
$g_s = 6.18 + 0.16 g_p$ (1.08)	$r = 0.26$ DW = 1.47
$g_s = 7.28 - 0.07 g_p$ (0.84)	$r = 0.21$ DWG = 0.89
(C): 1951-1999	
$g_p = 0.10 + 0.48^* g_s$ (1.89)	$r = 0.27$ DW = 2.82
$g_s = 3.50 + 0.32^{***} g_p$ (4.75)	$r = 0.57^{***}$ DW = 0.88
$g_s = 5.40 + 0.15^* g_p$ (1.89)	$r = 0.27^*$ DW = 1.44
$g_s = 5.22 + 0.06 g_p$ (1.23)	$r = 0.18$ DW = 0.67

Three main points emerge from these correlations. First, correlation between growth of the primary and the secondary sector, though positive, is feeble. This is contrary to what may be envisaged, the possible reasons for which formed one of the themes of an earlier article of the present author (1990). Secondly, growth of the services sector is closely interlinked to the pace of expansion of the Industrial sector. This is true for 1951-99 period as a whole as also separately for its two sub-sets. It should, however, be noted from regression equations given in Table 22 that DW values indicate the presence of auto-correlation for some of the regressions during 1951-99. It is absent for the sub-period 1951-81 and is within the indeterminate range for 1981-99.

In contrast, growth of the primary sector does not appear to be exercising that important an influence on the pace of expansion of the services sector. It follows from this that if one is viewing national growth process of the past five decades in terms of inter-action of the three main sectors, the influence of secondary sector through its repercussion on the growth of tertiary sector stands out more prominently than that of the primary sector, which does not reveal its role in

terms of its correlation either with growth of secondary sector or with growth of the tertiary sector. Therefore, if one goes by this criterion, the secondary sector does emerge to have played a stronger "engine of growth" role than that of the primary sector, despite the fact that its direct correlation with growth of national income was the least during 1951–81 and was less than that of primary sector during 1981–99.

## **(B) Regional level cross-sectional analysis**

We now turn to inter-sectoral relations revealed by cross-sectional analysis of sectoral growth in major Indian states. For this purpose, two sets of cross-sectional correlations have been derived for period prior to 1980–81 and one set for the period 1981–96. Set A pertains to the period 1951–81, set B pertains to 1961–81 while set C covers the subsequent fifteen years from 1980–81 to 1995–96. The data for regional analysis of growth during 1951–81 are based on linking of three series whose details have been spelt out in Mathur (1983). For estimating regional compound growth rates during these thirty years, single year data at the terminal points 1950–51 and 1980–81 have been used. This is necessitated by data availability constraints for earlier years. Moreover, for a span as wide as 3-decade period, one hopes that erratic nature, if any, of a terminal year would get substantially overshadowed by the quantum of growth.

In case of set B, only twenty year period from 1960–61 to 1980–81 is covered but sectoral domestic products of the first three and last three years have been averaged for estimating regional growth rates in order to reduce the influence of erratic behaviour of annual data on growth rates. This methodology could not be applied to the thirty-year period 1951–81 since in the case of nineteen-fifties, initial regional data are available only for one year (1950–51). Thus, while set B has the advantage of terminal averaging procedure, set A has the advantage of covering a longer span of time. Set C which covers the period from 1980–81 to 1995–96, is based on State Statistical Bureaus' data at 1980–81 prices. Compound Growth Rates have been estimated using the same methodology as for set B.

Table 23 and diagrams 2(a)–2(f) give estimates of regressions and correlation coefficients across states for the three periods. As may be observed from Table 23, the direct correlations of sectoral growth with overall growth for pre-1980 period broadly follow the same pattern as in case of time series analysis at the national level. The slopes of all three regression lines are also less than unity.

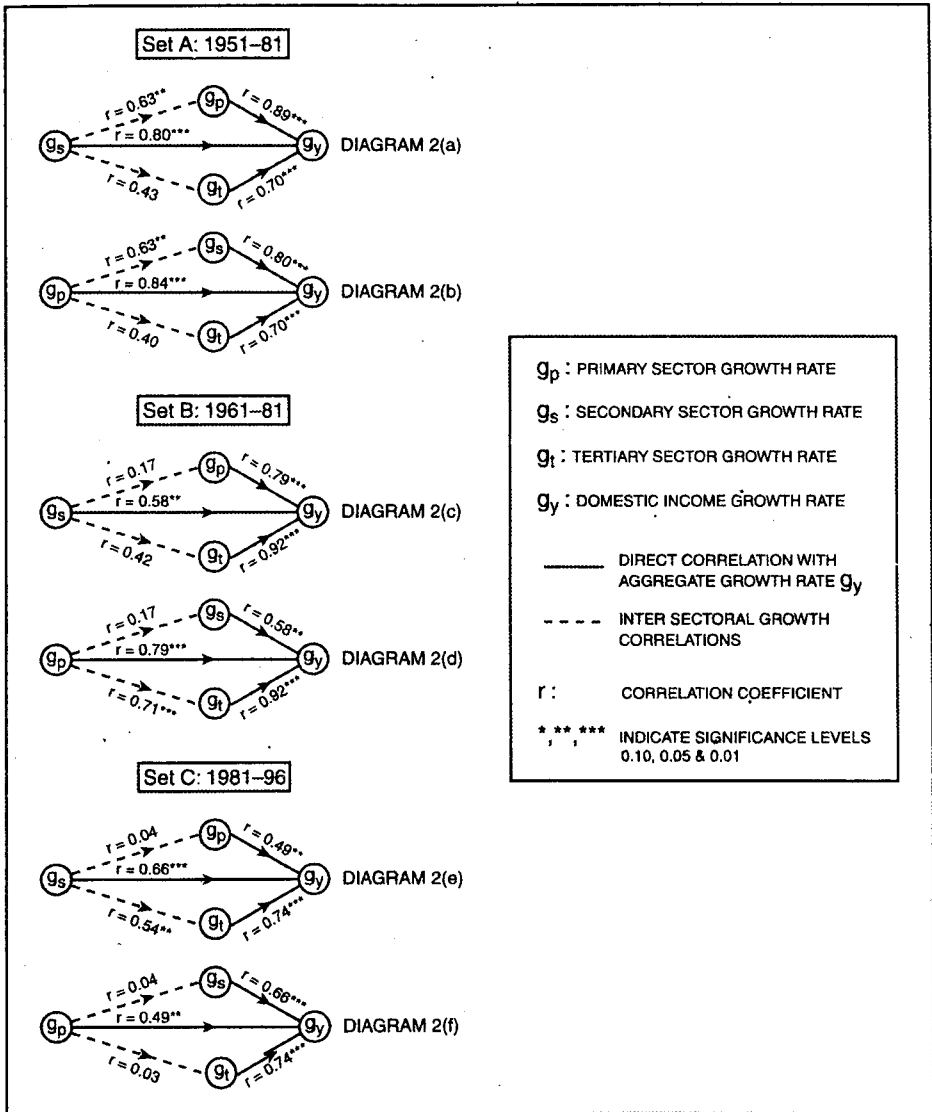
When one shifts attention to regressions based on regional growth rates during the post-1980 period covering the phase 1981–96 (set C), one can again observe broad similarity to changes in the post-1980 period indicated on the basis of national level inter-temporal regressions. But it may be noted that the strength of correlation coefficient of secondary sector growth with aggregate growth as well as its regression coefficient is higher during 1981–96 compared to that during 1961–81. These characteristics do point to the growing significance of industrialization in the process of regional economic growth.

Inter-sectoral growth relationships across regions for 1981–96 reveal a somewhat different pattern than that for 1951–81 (diagram 2). Both set A and set B results indicate that regional tertiary sector growth is much more closely linked to growth of the primary sector than was revealed by time series analysis at the national level. However, results for 1981–96 are much more in alignment with the inter-temporal relationships observed at the national level. Among the inter-sectoral growth relationships across regions for 1981–96, the strongest is that of secondary sector growth with tertiary sector growth. The relationships of secondary sector growth to primary sector growth and that of primary sector growth to tertiary sector growth are both feeble. The growing significance of secondary sector growth in the development process via its relationship to tertiary sector growth thus reaffirms emerging role of the industry based secondary sector growth as the “engine of growth” in the Indian economy. Attention to this facet was also drawn earlier in the paper, both on the basis of national level inter-temporal correlations and direct correlation of secondary sector growth to aggregate growth across regions. However, designating a sector as the ‘engine of growth’ does not imply that the process of growth can be generated without sustained growth in other sectors of the economy, each of which has a role to play a supporting overall growth of the economy.

**Table 23: Regional Regression Results**

Set A (1951–1981)		
Primary Sector	$g_y = 1.11 + 0.94^{***} g_p$ (1.85)	$r = 0.84^{***}$
Secondary Sector	$g_y = 0.69 + 0.59^{***} g_s$ (4.57)	$r = 0.80^{***}$
Tertiary Sector	$g_y = 1.08 + 0.52^{***} g_t$ (3.35)	$r = 0.70^{***}$
Set B (1961–81)		
Primary Sector	$g_y = 1.41 + 0.86^{***} g_p$ (4.40)	$r = 0.79^{***}$
Secondary Sector	$g_y = 1.79 + 0.34^{**} g_s$ (2.46)	$r = 0.58^{**}$
Tertiary Sector	$g_y = 0.34 + 0.68^{***} g_t$ (8.22)	$r = 0.92^{***}$
Set C (1981–1996)		
Primary Sector	$g_y = 3.19 + 0.36^{**} g_p$ (2.10)	$r = 0.49^{**}$
Secondary Sector	$g_y = 1.98 + 0.66^{**} g_s$ (3.29)	$r = 0.66^{***}$
Tertiary Sector	$g_y = 0.67 + 0.66^{***} g_t$ (4.15)	$r = 0.74^{***}$

DIAGRAM 2: REGIONAL GROWTH RELATIONSHIPS



An increased role of industrialisation in generating growth, but a sluggish pace of industrial expansion which was observed in section II, represents an incongruent situation. Policy for sustaining the tempo of industrialisation and the related tertiary growth shall have to devise an appropriate blend of measures which provide support to domestic industry based on the Kaldorian concept of 'dynamic increasing returns', but within the framework of a more open and competitive economy (also see Young, 1928; Weiss, 1988; Mathur, 2000a).

## IX Main Conclusions

This paper has examined a few key facets of national and regional economic growth in India over the past five decades, but with a focus on the eighties and nineties. The main points, which emerge from this analysis, are now put together in what follows:

1. There is a distinct break in the eighties from the declining growth momentum of the seventies. The higher plateau of the overall pace of growth in the eighties was marginally improved upon in the decade of nineties (up to 1999–2000). But the nineties witnessed the emergence of a very disturbing trend. This was a decline in the growth rate of the two real production sectors, that is the primary and secondary sectors. A rise in the rate of tertiary sector growth during the nineties without the backing of real production is an imbalance, which cannot be justified or sustained, in the longer run perspective.
2. The top six states in terms of their overall growth rate during the period 1961–89 were Haryana, Punjab, Gujarat, Rajasthan, Assam and Karnataka. If one considers eighties by itself, the new group of top six states contains Rajasthan, Haryana, Maharashtra, Andhra Pradesh, Karnataka and Tamil Nadu (Table 4). In post-reform period of the first half of the nineties there was considerable reordering, with Kerala and West Bengal as the two main new entrants in the top-six growth rate category, while Haryana and Rajasthan slumped to the lowest growth category states. Andhra, Maharashtra and Gujarat emerged as the three fastest growing states.
3. Considerable sectoral growth rate disparity could be witnessed in case of some of the well-developed states during the eighties and nineties. Notable among these were Andhra and Gujarat, both of which displayed very poor primary growth performance as against their high growth rank in the other two sectors. On the other hand, a well-placed Punjab displayed the lowest tertiary sector growth in contrast to its high growth rank in case of the primary and secondary sector growth. Similarly, whereas West Bengal had bounced up to the top in terms of primary sector growth, in the secondary and tertiary sector growth it had the lowest ranks.
4. The impact of growth on change in state per-capita incomes between 1981 and 1996 shows that the five maximum levels of increase took place in case of Maharashtra, Gujarat, Punjab, Tamil Nadu and Haryana, all of which are well developed states. The lowest level of change on the other hand occurred in Bihar, Assam, Orissa, U.P. and Madhya Pradesh, all of which belong to the relatively backward category.
5. State Income Relatives, (i.e. index of state-wise regional development) reveal that over the period 1981–96 only 4–6 states fall in the above all-

India average category as against 10–12 below it, showing concentration of high development only within a few states. Moreover, over the period 1981–96 continuous rise in the index occurred in case of five developed states (Gujarat, Maharashtra, Karnataka, Tamil Nadu and Andhra) while continuous decline occurred in case of the least developed states (Bihar, Madhya Pradesh, Orissa and U.P.).

6. The above tendencies have inevitably brought about a rise in overall regional income disparities as reflected in steep acceleration in the rise of coefficient of variation of per-capita incomes during 1991–96 (Table 10). Sectoral trends reveal that whereas rising primary sector disparities have tended to get arrested during the nineties, it is basically secondary and tertiary sector disparities, which have tended to widen sharply during the nineties.
7. Whereas within the middle-income states there has been a tendency towards convergence, it is the high and low-income states that have been characterised by income divergence and have primarily been responsible for overall regional income divergence in the country.
8. Structural Income Change at the all-India level during the five-decade period 1951–2000 shows the shift towards secondary sector to have been the least (+11.34). Moreover, unlike almost a unidirectional change in case of the primary and tertiary sector shifts (Table 14), there have been substantial decadal fluctuations in case of the secondary sector shift. There was a major dip from +3.30 in sixties to +1.68 in seventies. But the decline in the shift from +2.90 in eighties to a meagre +0.14 during the first half of nineties in nineties has been much more substantial, pointing to shaky health of the industrial sector during the nineties.
9. Correlation of state-wise sectoral percentages with the level of development as reflected in per-capita incomes shows secondary sector to be the most strongly correlated to the level of development in a positive direction. Moreover, this relationship has been gaining in strength from 1981 to 1996 (Table 17), indicating that development of the secondary sector continues to occupy a strategic position despite phenomenal rise of the tertiary sector during the nineties.
10. Rise in the share of secondary sector during 1981–96 was the maximum in Gujarat, followed by that in Punjab, Andhra, Bihar, Haryana, Madhya Pradesh and Rajasthan. But the magnitude of this shift bore very feeble relationship ( $r = +0.14$ ) to the level of development of the states (Table 19).
11. The issue as to which sector has been the 'engine of growth' was examined within a modified Kaldorian framework. The main criticism of the Kaldorian methodology of directly correlating a sector's growth with aggregate growth of the economy has been that the value of correlation coefficient would be closely dependent upon the weight of that sector in the GDP. In order to overcome this criticism, the methodology adopted

here considers two hypotheses. The first one is that in a developing country primary sector growth is the kingpin of the process of growth; and second one is that, secondary sector is the kingpin. For this purpose, instead of directly correlating sectoral growth with GDP growth, for the first hypothesis the relationship of primary sector growth and GDP growth is inferred by looking at relationship of primary sector growth with growth of the other two sectors. Similarly, for the second hypothesis secondary sector growth is correlated with primary and tertiary sector growth.

The above-mentioned relationships were examined with the help of inter-temporal data at the all-India level and cross-sectional data at the regional level. The inter-temporal relationships at the national level and inter-regional relationships for 1981–96 both reveal that the influence of secondary sector growth through its repercussion on growth of the tertiary sector stands out more prominently than that of the primary sector, which does not exhibit its role that strongly in terms of its correlation either with growth of secondary sector or with growth of the tertiary sector. Therefore, the secondary sector, in conjunction with tertiary sector growth, does emerge to have played a stronger 'engine of growth' role than that of the primary sector.

12. In order to overcome weak position of industrial growth during the nineties, and keeping in mind the pivotal position of its role as the 'engine of growth' despite growing significance of *tertiarization*, the reform measures through which industrial growth has been addressed during the nineties need to be examined afresh.

*Keeping in mind the points which have emerged from preceding view of the national as well as regional scenarios from different angles, it is doubtful whether a high pace of overall growth can be sustained in the long run on the basis of a high pace of tertiarization without the backing of equally vibrant industrial and agricultural expansion and policies to support these.*

## References

- Ahluwalia, Montek S. (2000):** "Economic Performance of States in Post-Reforms Period", *Economic and Political Weekly*, Vol. XXXV (19).
- Barro, Robert J. and Xavier Sala-i-Martin (1995):** *Economic Growth*, Mc-Graw Hill, New York.
- Das, Tushar Kanti (1998):** 'Convergence' and 'Catch-Up': *An Empirical Analysis with Fourteen Major States of India*, Department of Economics, Utkal University, Utkal University, Bhubaneswar (mimeo.).
- Dholakia, Ravinder (1985):** "Interstate Variation in Economic Growth and State Income Inequality in India", in G. P. Mishra and A. Joshi (eds.), *Regional Structure of Development and Growth in India*, Ashish Publishing House, New Delhi.
- Frank, Andre, Gunder (1967):** *Capitalism and Underdevelopment in Latin America*, Monthly Review Press, New York.

- Gomulka, S. (1971):** *Inventive Activity and Stages of Economic Growth*, Institute of Economics, Aarhus.
- Government of India (2000 and 2001): *Economic Survey*, Ministry of Finance, New Delhi.
- Hirschman, Albert O. (1958):** *The Strategy of Economic Development*, Yale University Press, New Haven.
- Kakwani, Nanak (1967):** "Problems of Industrialization in Underdeveloped Countries", in his *Strategic Factors in Economic Development*, Cornell University Press, Ithaca.
- (1997): "Growth Rate of Per-Capita Income and Aggregate Welfare: And International Comparison", *Review of Economics and Statistics*, June.
- Kaldor, Nicholas (1966):** *Causes of the Slow Rate of Economic Growth of the United Kingdom*, An Inaugural Lecture, Cambridge University Press, Cambridge.
- Mathur, Ashok (1983):** "Regional Development and Economic Disparities in India: A Sectoral Analysis", *Economic Development and Cultural Change*, April.
- (1990): "The Interface of Agricultural and Industrial Growth in the Development Process: Some Facets of the Indian Experience", *Development and Change*, Vol. 22.
- (1994): "Regional Economic Development and Policy in India", in G. K. Chaddha (ed.), *Policy Perspectives in Indian Economic Development*, Har-Anand Publications, New Delhi.
- (2000a): "Industry" Chapter in *Alternative Economic Survey: 1998–2000*, Rainbow Publishers, Delhi.
- (2000b): "Reformed Swadeshism, Liberalization and Economic Theory: A Developmental Perspective", *Social Sciences Research Journal*, Vol. 7 (2) (Panjab University).
- (2001): "Kaldor's Laws and Economic Growth in India : Some Conceptual Issues and Empirical Evidence" in Raj Kumar Sen and Biswajit Chatterjee (eds.), *Indian Economy: Agenda for the 21<sup>st</sup> Century*, Essays in Honour of Professor P. R. Brahmananda (forthcoming).
- McCombie, John S. L. and John R. de Ridder (1983):** "Increasing Returns, Productivity and Output Growth : The Case of the United States", *Journal of Post-Keynesian Economics*, Spring Issue.
- Nair, K. R. G. (1994):** *Regional Economics: A Survey*, an ICSSR Research in Economics Monograph No. 7, New Delhi.
- (1982): *Regional Experience in a Developing Economy*, Wiley Eastern, New Delhi.
- Prebisch, R. (1984):** "Five Stages in My Thinking on Development", in G. M. Meier and D. Seers (eds.), *Pioneers in Development*, Oxford University Press, New York.
- Singh, Ajit Kumar (1985):** "Inter-State Differences in Levels and Rates of Growth of Income in India: 1951–81", in G. P. Mishra and A. Joshi (eds.), *Regional Structure of Development and Growth in India*, Ashish Publishing House, New Delhi.
- (1999): "Inter-State Disparities in Per-Capita SDP: Trends and Causes", *Arth Vijnana*, Vol. XLI (2).
- Thirlwall, A. P. (1983):** "A Plain Man's Guide to Kaldor's Growth Laws", *Journal of Post-Keynesian Economics*, Spring Issue.
- Weiss, John (1988):** *Industry in Developing Countries: Theory, Policy and Evidence*, Croom Helm, London.
- Williamson, J. G. (1965):** "Regional Inequality and the Process of National Development: A Description of the Patterns", *Economic Development and Cultural Change*, Vol. 13 (4), Pt. 2.
- Young, Allyn (1928):** "Increasing Returns and Economic Progress", *Economic Journal*, Vol. XXXVIII (152).