Chapter 17
Interstate Variations in Levels and Growth of Industry: Trends During the Last Three Decades

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1 Introduction

Inter-regional disparity in the levels of economic development and per capita income has been a major issue in development debate and policy in India. There are large variations in the different indicators of development among the states which finally get reflected in the differences in per capita incomes and levels of living. There have, of course, been changes in the extent of disparities and in the relative positions of different states over the years. Some decline in overall inequalities in per capita income among states was observed in the initial two to three decades after Independence, but there has been an increasing trend since then. The Gini coefficient of interstate inequality in per capita income was 0.152 in 1981 and increased to 0.225 by 1997–1998 (Ahluwalia 2000). In the post-2000 period, some of the poorer states have registered faster than average growth in gross state domestic product (GSDP) and growth of some of the developed states has slowed down. As a result, the Gini coefficient has remained at around 0.24 during 2001–2009 (Ahluwalia 2011).

It is generally argued that it is primarily the level of industrialization and growth of industry that determine the relative levels of economic development of different regions, for development of agriculture is primarily dependent on the quantity and quality of land which is more or less given, and growth of services mostly follows the growth of agriculture and industry. It is for this reason that most policy instruments for balanced regional development such as investment licences and fiscal and financial incentives that have been adopted in India have been directed towards industry, with the overall objective of 'industrial development of backward areas'.

Most of these policy measures have been discontinued since the introduction of economic reforms in the early 1990s. At the same time, the rate of economic growth has significantly accelerated, in which industry has played a role, even though not the major one. How has the industrial growth in post-reform period been distributed

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across states? Expectations were rather conflicting. On the one hand, discontinuation of policies favouring industrially backward areas could discourage industrial investment in less-industrialized states and, thus, increase disparities. On the other hand, deregulation permitting free flow of goods and services, internally and externally, would encourage poor states to better utilise their comparative advantage, thus leading to a decline in disparities in industrial development. It is, therefore, interesting to study the pattern of industrial growth in the post-reform period when most of the 'interventionist' measures have been removed in comparison with the pre-reform period when they were in place.

It is in this context that this chapter looks at the changes in the levels of industrialization, rates of industrial growth and shares of different states in all-India industrial output and employment. In the process, it also examines whether rates of industrial growth and changes in the levels of industrialization have gone together with GSDP growth rates of different states. The chapter also makes an attempt to examine the factors that have led to differences in the rates of industrial growth, particularly, in the more recent period. It may be noted that 'industry' is confined to 'manufacturing', in this chapter.

2 The Extent of Industrialization: Trends towards Convergence or Divergence among States?

Differences in the extent of industrialization are one of the most glaring aspects of the variations in the levels and structure of state economies. The share of manufacturing in the GSDP varies very widely among the Indian states. In terms of this indicator, Gujarat with about 30 % share of manufacturing in GSDP was the most industrialized state among the major states of India in 2008–2009 (Table 17.1). Other major states which had a higher than the national figure of 17 % were Maharashtra (23.46 %), Tamil Nadu (23.32 %), Haryana (20.0 %), Karnataka (19.85 %) and Orissa (17.04 %). Kerala had the lowest 9.96 % of its state domestic product (SDP) originating in manufacturing. Andhra Pradesh followed by Bihar and Uttar Pradesh were other states with a low level of industrialization with only 12–14 % of their SDP originating in manufacturing.

Among the three new states—Chhattisgarh, Jharkhand and Uttarakhand—Chhattisgarh and Jharkhand feature as relatively better-industrialized states with 21.94 and 32.02 % share of manufacturing in their SDP. Uttarakhand with 14.12 % of its SDP from manufacturing is among the states with a low level of industrialization. All states in the northeastern region except Assam (10.74 %) had less than 10 % of their SDP from the manufacturing industry. Among union territories (UTs) and other states, Pondicherry (65.49 %) and Goa (30.08 %) showed a relatively high degree of industrialization. The share of industry in gross domestic product (GDP) ranged between 9.96 % in Kerala, the least industrialized state, and 29.94 % in Gujarat, the most industrialized state, in 2008–2009. The range of variation seems to have marginally declined from 1980 to 1981, when the least industrialized state

Table 17.1 Share of manufacturing in total GSDP (%) at 1993–1994 prices. (Source: www.mospi.gov.in)

		1980–1981	1990–1991	2000–2001	2008–2009
Major States					
1	Andhra Pradesh	13.86	15.32	13.69	12.05
2	Bihar (+)	9.92	12.56	9.17 (3.73)	13.27 (2.50)
3	Gujarat[a]	18.92	26.14	30.41	29.94
4	Haryana[b]	13.65	19.10	20.59	20.00
5	Karnataka	15.25	18.63	17.26	19.85
6	Kerala[a]	9.52	11.11	11.68	9.96
7	Madhya Pradesh (+)	11.11	15.50	16.46 (15.08)	15.35 (12.73)
8	Maharashtra[a]	24.92	26.08	23.93	23.46
9	Orissa	9.08	11.29	12.13	17.04
10	Punjab	9.21	13.61	15.96	16.05
11	Rajasthan	12.43	12.36	16.50	15.63
12	Tamil Nadu	31.47	28.54	24.36	23.32
13	Uttar Pradesh (+)	9.01	13.87	13.85 (14.00)	14.02 (14.01)
14	West Bengal[a]	20.31	17.80	17.28	16.37
New States					
15	Chhattisgarh	–	–	18.50	21.94
16	Jharkhand	–	–	19.17	32.02
17	Uttarakhand	–	–	11.74	14.12
North Eastern States					
18	Arunachal Pradesh[a]	3.80	2.60	3.43	2.03
19	Assam	9.55	9.17	7.67	10.74
20	Manipur	6.41	13.53	7.93	7.48
21	Meghalaya	1.80	2.42	2.07	8.49
22	Mizoram	1.49	2.87	1.73	2.13
23	Nagaland[b]	5.09	3.65	1.12	1.40
24	Sikkim	0.00	0.00	4.13	3.48
25	Tripura[a]	3.44	2.78	4.85	2.82
Union Territories and Other States					
26	A&N Islands[a]	7.27	6.39	4.80	3.35
27	Chandigarh	N.A.	N.A.	15.63	12.72
28	Delhi	8.25	8.94	11.49	8.80
29	Dadra and Nagar Haveli	N.A.	N.A.	N.A.	N.A.
30	Daman and Diu	N.A.	N.A.	N.A.	N.A.
31	Lakshadweep	N.A.	N.A.	N.A.	N.A.
32	Pondicherry	20.39	28.74	49.10	65.49
33	Goa[a]	24.24	22.29	33.26	30.08
34	Himachal Pradesh[a]	3.01	7.32	15.02	13.64
35	Jammu & Kashmir[a]	N.A.	N.A.	5.86	8.10
	India	*13.80*	*16.60*	*17.20*	*17.00*
	SD	*6.78*	*5.82*	*5.74*	*5.29*
	CV	*45.52*	*33.70*	*33.06*	*30.08*

Figure in parentheses against Bihar, Madhya Pradesh and Uttar Pradesh are for the territory after division while those outside include newly formed Jharkhand, Chhattisgarh and Uttarakhand, respectively, in this as well as other tables

Estimates of standard deviation (*SD*) and coefficient of variation (*CV*) are based on 14 major states

N.A. not available

[a] Latest available data are for the year 2007–2008

[b] Latest data available are for the year 2006–2007

(Kerala) had 9.52 % of its SDP originating from manufacturing, while in the most industrialized state (Tamil Nadu) manufacturing contributed 31.47 %. But the states in the most industrialized category have changed their relative positions. In fact, West Bengal which held the second position in 1980–1981 has gone out of the group of the top five to the seventh position. Haryana which was below the national average has acquired the fourth position. Tamil Nadu yielded its first position in 1980–1981 to Gujarat in 2008–2009; the latter held the fourth position in 1980–1981. Orissa which had a much lower than the national extent of industrialization rose to the national average in 2008–2009. Other states which have experienced relatively rapid industrialization during the 28-year period in terms of a significant increase in the share of manufacturing in GSDP are Karnataka, Punjab, Madhya Pradesh, Rajasthan and Uttar Pradesh. Gujarat, of course, had the fastest advance in industrialization, raising its manufacturing share in SDP from 19 % in 1980–1981 to 30 % in 2008–2009. Among smaller states and UTs, Himachal Pradesh (from 3.01 % in 1980–1981 to 13.64 % in 2008–2009) and Pondicherry (from 20.39 % in 1980–1981 to 65.49 % in 2008–2009) made rapid advance in industrialization.

West Bengal saw a 'deindustrialization' insofar as manufacturing contributes now only 16.4 % in SDP as compared to 20.3 % 28 years back. Maharashtra and Andhra Pradesh also experienced some decline in the share of manufacturing in their SDP from 25 to 24 % and from 14 to 12 %, respectively. Northeastern states in which some such decline has taken place are Arunachal Pradesh (3.80–2.03 %), Nagaland (5.09–1.40 %) and Tripura (3.44–2.82 %). Andaman and Nicobar Islands also saw a significant decline in the share of manufacturing SDP from 7.27 to 3.35 %.

It is noteworthy that most states have seen either a decline or virtual stagnation in the extent of industrialization, in the post-reform period. Only three among the major states, Orissa, Punjab and Rajasthan, have experienced an increase in the share of manufacturing in their GSDP since 1990–1991. Among smaller states, Himachal Pradesh features in this category .

Amidst changes in different directions and of varying extent, the overall disparity in the *degree of industrialization* seems to have declined. Both standard deviation (SD) and coefficient of variation (CV) have declined from one decade to another since 1980–1981. SD declined from 6.78 in 1980–1981 to 5.82 in 1990–1991 and further to 5.29 in 2008–2009 and CV from 45.52 % in 1980–1981 to 33.70 % in 1990–1991 and to 30.08 % in 2008–2009 (Table 17.1).

3 Industrialization, SDP Growth Rate and Structural Transformation

Has a faster pace of industrialization been accompanied also by a larger transformation of state economies from agricultural to non-agricultural? Is there a direct relationship between the increase in the share of manufacturing and decline in that of agriculture, as has been conventionally presumed? In this connection, it needs to be noted that over the years 1980–1981 to 2008–2009, the share of agriculture in the national GDP declined from 39.70 to 16.20 % (Table 17.2). This decline has,

Table 17.2 Share of agriculture in total GSDP (%) at 1993–1994 prices

		1980–81	1990–91	2000–01	2008–09
Major States					
1	Andhra Pradesh	38.66	33.31	28.61	22.23
2	Bihar(+)	52.45	43.84	38.43 (46.56)	25.74 (31.62)
3	Gujarat[a]	38.21	27.02	15.19	16.00
4	Haryana[b]	49.09	42.94	32.07	23.10
5	Karnataka	43.56	33.45	26.37	13.83
6	Kerala[a]	41.70	31.16	23.64	15.68
7	Madhya Pradesh (+)	47.30	38.01	24.03 (25.87)	23.99 (26.23)
8	Maharashtra[a]	25.53	20.73	15.49	13.35
9	Orissa	54.59	38.69	28.22	19.24
10	Punjab	46.41	46.02	39.21	32.55
11	Rajasthan	43.80	41.11	26.73	24.00
12	Tamil Nadu	25.25	22.75	17.62	10.99
13	Uttar Pradesh (+)	48.05	39.27	35.60 (35.65)	27.72 (28.37)
14	West Bengal[a]	31.94	30.95	26.06	20.70
New States					
15	Chhattisgarh	–	–	18.25	18.33
16	Jharkhand	–	–	23.49	15.48
17	Uttarakhand	–	–	34.88	28.37
North Eastern States					
18	Arrunachal Pradesh[a]	44.96	31.79	28.99	16.31
19	Assam	49.21	41.48	34.02	23.93
20	Manipur	28.76	35.44	32.89	26.36
21	Meghalaya	41.75	29.45	25.06	21.03
22	Mizoram	26.96	21.14	19.67	15.38
23	Nagaland[b]	27.57	24.70	33.94	35.51
24	Sikkim	41.08	34.75	21.86	16.66
25	Tripura[a]	56.00	42.09	32.05	28.59
Union Territories and Other States					
26	A&N Islands[a]	43.69	47.39	29.32	11.90
27	Chandigarh	N.A.	N.A.	1.10	0.53
28	Delhi	4.28	2.98	1.31	0.63
29	Dadra and Nagar Haveli	N.A.	N.A.	N.A.	N.A.
30	Daman and Diu	N.A.	N.A.	N.A.	N.A.
31	Lakshadweep	N.A.	N.A.	N.A.	N.A.
32	Pondicherry	29.08	18.90	6.95	3.52
33	Goa[a]	20.55	14.53	8.44	4.46
34	Himachal Pradesh[a]	44.21	35.51	23.41	18.99
35	Jammu & Kashmir[a]	N.A.	N.A.	32.17	28.57
	India	*39.70*	*32.20*	*23.90*	*16.20*

Figure in parentheses against Bihar, Madhya Pradesh and Uttar Pradesh are for the territory after division while those outside include newly formed Jharkhand, Chhattisgarh and Uttarakhand, respectively, in this as well as other tables

N.A. not available

[a] Latest available data are for the year 2007–2008

[b] Latest data available are for the year 2006–2007

however, not meant a corresponding gain in the share of manufacturing which has increased at a much smaller pace, from 13.80 to 17.00 %. Major gain in the share has been for the services which rose from 36.60 % in 1980–1981 to 57.30 % in 2008–2009.

The phenomenon of a shift mainly from agriculture to services is observed in the case of most of the major states. Yet in some cases, particularly where industrialization has been rapid, decline in agriculture has been accompanied, to a large extent, by an increase in industry. Thus, in the case of Gujarat, share of agriculture declined from 38 to 16 %, that is, by 22 percentage points; it was accompanied by an equal increase in the share of both manufacturing and services, by 11 percentage points each (Tables 17.1 and 17.3). Similarly, in Orissa, a decline in the share of agriculture was accompanied by an increase not only in the share of services but also in manufacturing to a significant extent. On the other hand, in Kerala and Karnataka, services have taken the major share of the loss in the share of agriculture. In Punjab, agriculture has seen a relatively smaller decline in its share: It is the only state in which it still contributed almost one-third (32.6 %) of GSDP. The decline in the share of agriculture has, however, benefitted industry more than services. West Bengal is another stand-alone case with everything happening rather slowly: Agricultural GDP has declined by 11 percentage points only (against 24 % at the national level), industry share has significantly declined and that of services increased much less than the national average. Tamil Nadu is yet another exceptional case, where share of agriculture has sharply declined—it is now at the lowest (11 %) in any state—and share of manufacturing has also significantly declined, and all the gains have gone to services sector only. Among smaller states and UTs, a very sharp shift from agriculture to non-agricultural sector is observed in the case of Goa and Pondicherry. In the case of Goa, share of agriculture declined from 21 to 4 %, which was mostly compensated by an increase in the share of services from 40 to 56 %, Pondicherry saw a decline in the share of agriculture from 29 to 4 %; manufacturing increased its share by 45 percentage points from 20 to 65 %.

There are two questions that are of significant interest with regard to the relationship between growth and structural changes. One, has growth rate and structural transformation (shift from agriculture to non-agriculture) gone together? And two, which type of structural transformation, one characterized by shift to manufacturing or to services, has been more growth augmenting? Gujarat has been the fastest growing state during the entire period 1980–1981/2008–2009 and in both the sub-periods since 1991, having recorded a GSDP growth rate of 9.48 % during 1991–2001 and 11.71 % during 2001–2009 (Appendix A). It also has undergone a large transformation with share of agriculture in GSDP declining from 38 % in 1980–1981 to 16 % in 2008–2009. The largest transformation, has, however, been experienced by Karnataka reducing share of agriculture in its GSDP from 44 to 14 % during 1981–2009. Its rate of growth has also been quite high in recent years. Orissa has experienced the second highest growth after Gujarat during 2001–2009, and it has also seen rapid transformation in its economy: Share of agriculture in its SDP declined from 55 % in 1980–1981 to 28 % in 2000–2001 and to 19 % in 2008–2009. Kerala is another state where both growth rate and structural transformation have been fast. Slowest

Table 17.3 Share of services in total GSDP (%) at 1993–1994 prices

		1980–1981	1990–1991	2000–2001	2008–2009
Major States					
1	Andhra Pradesh	39.26	41.71	46.54	51.25
2	Bihar (+)	28.02	31.95	39.76 (43.39)	45.41 (51.28)
3	Gujarat[a]	33.22	37.34	44.18	44.38
4	Haryana[b]	25.39	29.81	40.18	46.43
5	Karnataka	31.59	39.17	46.13	54.53
6	Kerala[a]	40.92	50.35	56.09	60.73
7	Madhya Pradesh (+)	27.99	33.36	39.82 (40.55)	38.22 (39.71)
8	Maharashtra[a]	39.94	43.86	53.36	57.20
9	Orissa	27.16	34.76	43.38	45.07
10	Punjab	36.18	33.48	36.92	41.27
11	Rajasthan	33.94	35.12	41.15	41.90
12	Tamil Nadu	36.73	39.98	47.93	57.10
13	Uttar Pradesh (+)	33.94	37.90	40.30 (40.34)	42.00 (42.44)
14	West Bengal[a]	40.38	43.34	49.35	53.50
New States					
15	Chhattisgarh	–	–	37.55	34.44
16	Jharkhand	–	–	33.09	35.17
17	Uttarakhand	–	–	39.81	37.07
North Eastern States					
18	Arunachal Pradesh[a]	29.04	23.08	34.24	23.31
19	Assam	31.57	35.34	44.58	51.05
20	Manipur	23.13	41.59	46.24	41.03
21	Meghalaya	42.46	49.88	53.45	50.79
22	Mizoram	59.10	46.15	64.42	62.46
23	Nagaland[b]	52.78	59.14	53.46	48.70
24	Sikkim	41.63	51.34	52.91	50.00
25	Tripura[a]	39.37	49.84	59.23	58.42
Union Territories and Other States					
26	A&N Islands[a]	34.16	29.64	50.31	34.39
27	Chandigarh	N.A.	N.A.	72.74	72.20
28	Delhi	82.32	83.06	78.72	81.88
29	Dadra and Nagar Haveli	N.A.	N.A.	N.A.	N.A.
30	Daman and Diu	N.A.	N.A.	N.A.	N.A.
31	Lakshadweep	N.A.	N.A.	N.A.	N.A.
32	Pondicherry	34.56	37.44	40.77	29.38
33	Goa[a]	39.53	50.61	47.94	55.88
34	Himachal Pradesh[a]	33.65	38.69	41.57	40.95
35	Jammu & Kashmir[a]	N.A.	N.A.	51.44	48.76
	India	*36.60*	*40.60*	*46.90*	*57.30*

Figure in parentheses against Bihar, Madhya Pradesh and Uttar Pradesh are for the territory after division while those outside include newly formed Jharkhand, Chhattisgarh and Uttarakhand, respectively, in this as well as other tables

N.A. not available

[a] Latest available data are for the year 2007–2008

[b] Latest data available are for the year 2006–2007

Table 17.4 Relationship between structural change and its components and rate of growth of GSDP (correlation coefficients)

	1980–1981/ 1990–1991	1990–1991/ 2000–2001	2000–2001/ 2008–2009	1980–1981/ 2008–2009
Correlation between growth of GSDP & % change in the share of agriculture during 1980–1981/2008–2009	0.275	− 0.176	− 0.676[a]	− 0.181
Correlation between growth of GSDP & % change in the share of manufacturing during 1980–1981/2008–2009	0.078	0.038	0.029	0.056
Correlation between growth of GSDP & % change in the share of services during 1980–1981/2008–2009	0.010	− 0.040	0.429	0.082

[a] Significant at 0.01 level

transformation is observed in Punjab and West Bengal; both have also had slow growth of GSDP. Madhya Pradesh and Uttar Pradesh are also in the same category. Andhra Pradesh, Haryana and Rajasthan have grown relatively faster though the process of transformation has been rather slow in these states. Maharashtra already had a relatively low share of agriculture initially, seeing a significant decline in it and a reasonably high growth rate.

Among the northeastern states, Mizoram, Nagaland and Sikkim are the fastest growing states, having recorded a GSDP growth rate of 10 % per annum during 1981–2009. Mizoram and Sikkim have also undergone a large transformation with share of agriculture in GSDP declining during 1981–2009, from 27 to 15 % and from 41 to 17 %, respectively. Nagaland, however, seems to have experienced an increase in the share of agriculture from 28 to 36 %. Andaman and Nicobar Islands, Pondicherry and Goa also have very large transformation from agriculture to non-agriculture and a very high growth particularly during 2001–2009.

Insofar as decline in the share of agriculture is taken as a measure of structural transformation, its relation with growth of GSDP has been rather weak ($r = -0.181$) if we take the long period 1981–2009. Yet the two have been significantly related in the shorter period, 2001–2009, where $r = -0.676$. States with faster decline in the share of agriculture also seem to have recorded faster growth of GSDP, during this period. Changes in the share of manufacturing or services, either in the short or long term, do not seem to have any significant relation with GSDP growth rates in states (Table 17.4).

Punjab has seen the slowest transformation in its economy: Over a period of almost 30 years, the contribution of non-agricultural sectors has increased from 54 to 66 % only. It still derives about one-third of its SDP from agriculture, the highest in any state. Its growth rate has been one of the lowest around 5 %, against the national average of 7 %, during 1980–1981/2008–2009. During 2000–2001/2008–2009 when the national economy grew at 8.3 % per annum, the Punjab economy grew at 5.4 %. Strangely enough, Tamil Nadu, the state with the largest structural transformation of the economy, with the lowest, 11 %, share of agriculture in SDP, has also not done very well in terms of the growth of its GSDP. The state experienced

an average growth rate of 6.5 % over the period 1980–1981/2008–2009, though it has accelerated to 7.6 % during 2000–2001/2008–2009.

Did structural transformation in favour of manufacturing help in accelerating growth of a state? Here again, Gujarat provides strong positive evidence: It increased share of manufacturing in its GSDP from 19 % in 1980–1981 to 30 % in 2008–2009 and experienced the fastest economic growth overall. Orissa and Haryana are other states with significantly large increase in the share of manufacturing and both of them have grown reasonably fast. Bihar, Karnataka, Madhya Pradesh, Rajasthan and Uttar Pradesh have moderate increase in the share of manufacturing and relatively low GSDP growth. Punjab with significantly large increase in manufacturing share experienced low growth. Maharashtra and West Bengal both saw a decline in manufacturing share; while the former grew reasonably well, the latter grew at a relatively slow rate. On the whole, there appears to be a positive relation between the increase in the extent of industrialization and the rate of economic growth. This relation that holds in the case of most of the 14 major states is also observed in the case of Assam, Meghalaya, Pondicherry and Goa which have experienced a large increase in the share of manufacturing along with high growth rates. Himachal Pradesh, with significantly large increase in manufacturing share, on the other hand, experienced low growth.

There are few major states where the services sector has played a more important role in economic growth. Kerala, which now has the highest share (60.7 %) of services in its GSDP, rising from 41 % in 1980–1981 while the share of manufacturing remaining constant at around 10 % (Table 17.3), registered a reasonably high growth. So did Haryana with services share rising from 25 to 47 % and Karnataka from 32 to 55 %. The services sector has played an important role in economic growth in most of the northeastern states, Goa and Himachal Pradesh. Tamil Nadu and West Bengal did not see a large increase in the share of services nor did they experience very high growth rates. It appears that unlike in the country as a whole, services did not make a major contribution to growth in most states in recent years. It is only a few states which had a high weight of services and experienced high growth in that sector that seems to have been reflected in what is called a 'service-led growth' nationally. In most states' industry, particularly manufacturing seems to have made a more significant contribution to the growth of GSDP. In other words, a structural change in favour of manufacturing is more often accompanied by a higher GSDP growth than a change in favour of services. The relationship, however, does not turn up to be consistent once all states are taken together for comparison, as some have had manufacturing, while others have had services, pushing the GSDP growth. As a result, the coefficient of correlation between growth rates and change in the share of manufacturing and of services are not significant in the shorter or longer periods as noted earlier. It appears that faster growth of non-agricultural sectors as a whole, irrespective of whether it is derived from manufacturing or services, leads to high growth of GSDP.

4 Rates of Industrial Growth

How have different states performed in terms of the growth of manufacturing SDP over the longer period 1980–1981 to 2008–2009 and in the post-reform period, particularly during 2001–2009 when national aggregate growth rate has been relatively high. Gujarat is the only major state which has maintained high and accelerating growth rates over the years: Its manufacturing sector grew at more than 8 % during 1981–1991, at 9.5 % during 1991–2001 and a much higher rate of 11.7 % during 2001–2009 (Table 17.5). Among other better-industrialized states, Maharashtra maintained a moderate growth rate of 6–8.5 %. Tamil Nadu had a much lower average growth rate of about 6 %; only during 2001–2009, it attained a growth of 7.7 % per annum, and West Bengal's manufacturing sector grew at a still lower rate, averaging about 5 % over the entire period and slightly more than 6 % during the post-reform period.

Some of the less-industrialized states have shown spectacular growth of manufacturing during 2001–2009. Orissa registered a manufacturing growth of 15.6 % and Bihar 13.9 % during this period. Karnataka has also recorded a manufacturing growth of 10.5 %. Haryana and Punjab had a significantly high growth of this sector during 1981–1991, but it decelerated in the following two decades, especially in Punjab, where it has been only 6 % as against the national average of more than 10 %. Similar is the case with Uttar Pradesh. Andhra Pradesh and Kerala have maintained a relatively low growth over the whole period. All the three new states have registered a high growth rate in manufacturing GSDP during 2001–2009, Jharkhand having the highest, about 17 % growth rate. Among other states and UTs, Meghalaya, Pondicherry and Himachal Pradesh registered relatively high, more than 11 % rate of growth over the entire period 1981–2009.

Growth rates of manufacturing in different states seem to show a tendency towards divergence over the longer period. The CV among growth rates of different states was 33 % during 1981–1991, it declined to 28 % during 1990–1991/2000–2001, but increased to 36 % during 2000–2001/2008–2009. Also, while better-industrialized states grew slower than the less industrialized during 1981–1991, the reverse seems to have happened in recent decades. Correlation between initial level of industrialization and growth rate was negative during 1981–1991 (-0.317); it turned positive and significant during 1991–2001 (0.484) and 2001–2009 (0.601). Thus, it appears that the trend towards a decline in differences in the level of industrialization among states observed in earlier years has been reversed in the post-reform period.

5 Shares of States Manufacturing

Maharashtra has always accounted for the largest share in manufacturing output of the country. In 2006–2007, it contributed about one fifth of the manufacturing GSDP of all the states of India. It has maintained that share all along though there is a small decline in it from that in 1980–1981 (Table 17.6). Tamil Nadu used to be the

Table 17.5 Growth rate of manufacturing GSDP (at 1993–1994 prices). (Source: same as Table 17.1)

		1980–1981/ 1990–1991	1990–1991/ 2000–2001	2000–2001/ 2008–2009	1980–1981/ 2008–2009
Major States					
1	Andhra Pradesh	5.36	5.20	6.92	5.10
2	Bihar (+)	6.24	3.18	13.95 (1.44)	3.94
3	Gujarat[a]	8.29	9.48	11.71	8.17
4	Haryana[b]	10.42	6.80	8.13	7.33
5	Karnataka	7.07	6.90	10.51	7.42
6	Kerala[a]	3.26	5.92	6.19	5.12
7	Madhya Pradesh (+)	6.52	6.58	5.44 (2.26)	5.82
8	Maharashtra[a]	6.79	6.27	8.64	6.29
9	Orissa	8.78	4.17	15.60	6.68
10	Punjab	8.98	6.43	6.18	6.49
11	Rajasthan	6.66	9.37	7.84	6.96
12	Tamil Nadu	4.06	5.06	7.70	4.56
13	Uttar Pradesh (+)	9.53	4.80	6.26 (5.85)	5.65
14	West Bengal[a]	3.32	6.36	6.07	5.21
New States					
15	Chhattisgarh	–	–	11.66	–
16	Jharkhand	–	–	16.88	–
17	Uttarakhand	–	–	12.15	–
North Eastern States					
18	Arunachal Pradesha	8.14	7.10	2.85	6.56
19	Assam	2.96	1.87	8.86	3.91
20	Manipur	7.81	3.37	5.19	4.46
21	Meghalaya	7.50	7.74	14.85	11.22
22	Mizoram	9.85	5.42	9.27	7.81
23	Nagaland[b]	11.73	−0.55	8.38	6.11
24	Sikkim	N.E.	N.E.	6.55	N.E.
25	Tripura[a]	3.05	12.82	4.52	8.44
Union Territories and Other States					
26	A&N Islands[a]	2.63	3.87	7.56	2.80
27	Chandigarh	N.E.	N.E.	9.20	N.E.
28	Delhi	8.04	3.35	5.83	5.47
29	Dadra and Nagar Haveli	N.E.	N.E.	N.E.	N.E.
30	Daman and Diu	N.E.	N.E.	N.E.	N.E.
31	Lakshadweep	N.E.	N.E.	N.E.	N.E.
32	Pondicherry	7.44	19.53	14.02	13.05
33	Goa[a]	0.71	10.68	8.68	8.08
34	Himachal Pradesh[a]	14.52	14.90	6.65	12.46
35	Jammu & Kashmir[a]	N.E.	N.E.	11.03	N.E.
	India	*7.44*	*7.02*	*8.20*	*6.77*
	SD	*2.26*	*1.74*	*3.15*	*1.20*
	CV	*33.15*	*28.21*	*36.38*	*19.79*

Table 17.5 (continued)

	1980–1981/ 1990–1991	1990–1991/ 2000–2001	2000–2001/ 2008–2009	1980–1981/ 2008–2009
Correlation between growth of manufacturing GSDP 1980–1981/ 2008–2009 and initial share of manufacturing GSDP	– 0.208	0.484c	0.601c	0.285

Figure in parentheses against Bihar, Madhya Pradesh and Uttar Pradesh are for the territory after division while those outside include newly formed Jharkhand, Chhattisgarh and Uttarakhand, respectively, in this as well as other tables

Estimates of standard deviation (SD) and coefficient of variation (CV) are based on 14 major states

N.E. not estimated

Latest available data are for the year 2007–2008

[a] Latest data available are for the year 2006–2007

[b] Correlation is significant at 0.01 level

second largest contributor to the national manufacturing GSDP until 1990–1991 but has now given way to Gujarat: The former accounted for 14 % and latter 8 % of national manufacturing GDP in 1980–1981; their shares in 2006–2007 are 11 and 14 %, respectively. West Bengal has been a major loser with a share of 10 % in 1980–1981 and only 7 % in 2006–2007. Other losers are: Andhra Pradesh (from 7.3 to 6.1 %), Madhya Pradesh (from 5.7 to 4.7 %), Assam (from 1.42 to 0.90 %) and Delhi (from 1.95 to 1.87 %). Gainers include Karnataka, Haryana, Goa and Pondicherry. Uttar Pradesh, a significant contributor with about 8 %, has maintained its share. This pattern of changes in the GSDP shares seems to be in line with the changes in investment shares reported in an earlier study covering the immediate pre-reform and post-reform periods (Chakravorty and Lall 2007).

The four most industrialized states, viz. Maharashtra, Tamil Nadu, West Bengal and Gujarat, accounted for 53 % of the total manufacturing GDP of 14 major states of India in 1980–1981; their share is lower at 51 % in 2006–2007. West Bengal continues to be part of this group in 2006–2007, only because Uttar Pradesh has lost part of its territory to Uttarakhand, which otherwise would have had a higher share than that of West Bengal. Among the states with relatively small (1–3 %) contribution to national manufacturing GSDP in 1980–1981, Haryana, Orissa, Punjab and Himachal Pradesh have improved their shares while Kerala has a lower share in 2006–2007 than in 1980–1981. Among other major states, Andhra Pradesh and Madhya Pradesh (even including Chhattisgarh) and Bihar (even including Jharkhand) have lost, while Karnataka and Rajasthan have gained. On the whole, the relative position of different states has not changed much, except a 6 percentage point rise in the share of Gujarat, a 4 percentage point decline in the share of Tamil Nadu and 3 percentage point decline in that of West Bengal. Among the new states, only Chhattisgarh and Jharkhand each have a significant (about 2 %) share of manufacturing GDP of the country and both, especially Jharkhand, have increased their shares since their formation in 2000. Among other states and UTs, only Delhi contributes more than 1 % of manufacturing GSDP and it has maintained its share of around 2 %.

Table 17.6 State-wise distribution of manufacturing GSDP (%) at 1993–1994 prices. (Source: same as Table 17.1)

		1980–1981	1990–1991	2000–2001	2006–2007
Major States					
1	Andhra Pradesh	7.33	6.80	6.14	6.12
2	Bihar (+)	4.17	4.51	2.54 (0.67)	3.62 (0.41)
3	Gujarat	7.98	9.58	11.72	13.70
4	Haryana	2.54	3.40	3.63	3.69
5	Karnataka	5.21	5.38	5.86	6.77
6	Kerala	2.71	2.15	2.32	1.98
7	Madhya Pradesh (+)	5.71	6.31	5.70 (4.15)	4.71 (2.85)
8	Maharashtra	20.51	20.34	19.89	19.70
9	Orissa	1.79	1.55	1.49	2.21
10	Punjab	2.41	3.09	3.46	2.92
11	Rajasthan	3.25	3.47	4.46	3.99
12	Tamil Nadu	14.81	12.12	11.37	10.58
13	Uttar Pradesh (+)	7.38	9.68	8.35 (7.88)	7.39 (6.82)
14	West Bengal	9.70	6.91	7.54	7.02
New States					
15	Chhattisgarh	N.A.	N.A.	1.54	1.86
16	Jharkhand	N.A.	N.A.	1.87	3.21
17	Uttarakhand	N.A.	N.A.	0.47	0.57
North Eastern States					
18	Arunachal Pradesh	0.02	0.02	0.03	0.02
19	Assam	1.42	1.08	0.70	0.90
20	Manipur	0.12	0.14	0.11	0.09
21	Meghalaya	0.02	0.03	0.04	0.09
22	Mizoram	0.002	0.01	0.01	0.01
23	Nagaland	0.01	0.03	0.01	0.01
24	Sikkim	0.00	0.00	0.01	0.01
25	Tripura	0.05	0.04	0.11	0.06
Union Territories and Other States					
26	A&N Islands	0.03	0.02	0.02	0.01
27	Chandigarh	N.E.	N.E.	0.23	0.22
28	Delhi	1.95	2.47	2.14	1.87
29	Dadra and Nagar Haveli	N.E.	N.E.	N.E.	N.E.
30	Daman and Diu	N.E.	N.E.	N.E.	N.E.
31	Lakshadweep	N.E.	N.E.	N.E.	N.E.
32	Pondicherry	0.19	0.21	0.61	0.77
33	Goa	0.55	0.40	0.67	0.69
34	Himachal Pradesh	0.13	0.27	0.60	0.54
35	Jammu & Kashmir	N.E.	N.E.	0.26	0.30
	India	*100.00*	*100.00*	*100.00*	*100.00*
	SD	*5.30*	*4.97*	*4.92*	*4.97*
	CV	*77.67*	*72.97*	*72.96*	*73.65*

Figure in parentheses against Bihar, Madhya Pradesh and Uttar Pradesh are for the territory after division while those outside include newly formed Jharkhand, Chhattisgarh and Uttarakhand, respectively, in this as well as other tables

Estimates of standard deviation (SD) and coefficient of variation (CV) are based on 14 major states

N.A. not available, N.E. not estimated

In terms of employment, however, Uttar Pradesh accounts for the largest share of manufacturing (Table 17.7). In 2004–2005 (the latest year for which data are available), it accounted for 15 % of the manufacturing employment of the country. Tamil Nadu, West Bengal and Maharashtra employed about 11 % each, Andhra Pradesh 8 % and Gujarat 7 % of all manufacturing workers in the country. Karnataka and Madhya Pradesh contributed more than 5 % each. Employment shares of different states have not significantly changed over the years, except some decline in the case of Bihar (even including Jharkhand) and increase in the case of Gujarat. Except the 14 major states and Chhattisgarh, Jharkhand and Delhi, all other 18 states/UTs contributed less than 1 % each of the countrywide manufacturing employment in 2004–2005.

There are large differences between the employment and GSDP shares of individual states. Maharashtra with more than 21 % of GSDP contributed only 11 % of employment among the 14 major states. Uttar Pradesh with 16 % employment has much less, about 8 % share in GSDP, and Gujarat with 14 % SDP had only 7 % share in employment. This is a reflection of large variations in the industrial structure and productivity among states.

6 Conclusions: What Explains Variations?

Description and analysis of various aspects of industrial development in different states presented in the preceding sections, even though not showing any clear pattern, reveal the following interesting trends:

1. As indicated by the share of manufacturing in GSDP, Tamil Nadu, Maharashtra, West Bengal and Gujarat were the most industrialized states in that order in 1980–1981. In 2008–2009, the four most industrialized states were Gujarat, Maharashtra, Tamil Nadu and Haryana, in that order. Gujarat is at the top with 30 % of its GSDP originating from manufacturing. Gujarat has also seen the fastest pace of industrialization, followed by Haryana, Punjab and Himachal Pradesh, while West Bengal, Andhra Pradesh and Tamil Nadu experienced a decline in the share of manufacturing in their respective GSDP. Disparities in the extent of industrialization have somewhat declined during 1981–2009.
2. Most states have experienced a significant shift from agriculture to other sectors; the shift has been the largest in Orissa, Karnataka, Gujarat and Kerala and relatively small in Punjab and West Bengal. A major shift has been in favour of manufacturing particularly in Gujarat, Rajasthan and Orissa. Larger structural changes have generally been accompanied by faster GSDP growth and shift to manufacturing more often than shift to services has contributed to faster growth.
3. Growth rates of manufacturing GSDP have been quite divergent throughout 1981–2009, but especially since 2001. Rates of growth have, however, not necessarily been higher in states with an initially high level of industrialization, except during the period 2001–2009. Thus, industrial growth in recent years has led to increasing divergence.

Table 17.7 State-wise distribution of manufacturing employment Usual Principal and Subsidiary Status (UPSS) (%). (Source: NSS Report on Employment and Unemployment (various rounds))

		1983	1993–1994	1999–2000	2004–2005
Major States					
1	Andhra Pradesh	9.08	8.53	7.73	8.17
2	Bihar (+)	5.71	3.07	5.61	4.65 (2.84)
3	Gujarat	6.42	8.25	5.61	7.25
4	Haryana	1.91	1.71	1.72	2.32
5	Karnataka	6.05	6.13	5.44	4.98
6	Kerala	4.46	3.93	3.94	3.6
7	Madhya Pradesh (+)	5.51	4.36	5.3	5.29 (4.24)
8	Maharashtra	9.85	10.26	10.36	10.5
9	Orissa	3.67	2.94	3.53	3.8
10	Punjab	2.35	1.87	2.32	2.6
11	Rajasthan	3.86	3.07	3.51	4.54
12	Tamil Nadu	12.8	14.86	12.7	11.09
13	Uttar Pradesh (+)	13.26	12.55	15.32	15.80 (15.44)
14	West Bengal	10.87	14.38	12.12	10.74
New States					
15	Chhattisgarh	–	–	–	1.05
16	Jharkhand	–	–	–	1.81
17	Uttarakhand	–	–	–	0.36
North Eastern States					
18	Arunachal Pradesh	0.01	0.02	0.02	0
19	Assam	0.73	0.81	0.92	0.73
20	Manipur	0.13	0.23	0.13	0.16
21	Meghalaya	0.06	0.03	0.02	0.08
22	Mizoram	0.01	0.01	0.01	0.02
23	Nagaland	0.01	0.01	0.01	0.02
24	Sikkim	0.02	0.02	0.01	0.01
25	Tripura	0.14	0.13	0.08	0.12
Union Territories and Other States					
26	A&N Islands	0.01	0.02	0.02	0.01
27	Chandigarh	0.06	0.16	0.13	0.12
28	Delhi	1.87	2.01	2.39	2.02
29	Dadra and Nagar Haveli	0.00	0.02	0.04	0.06
30	Daman and Diu	0.00	0.02	0.04	0.03
31	Lakshadweep	0.00	0.00	0.00	0.00
32	Pondicherry	0.12	0.13	0.20	0.14
33	Goa	0.23	0.10	0.14	0.07
34	Himachal Pradesh	0.23	0.25	0.30	0.37
35	Jammu & Kashmir	0.57	0.12	0.35	0.69
	India	*100*	*100*	*100*	*100*

4. The four states with the largest share in national manufacturing GDP, namely, Maharashtra, Tamil Nadu, West Bengal and Gujarat, have continued to account for more than half the national gross value added (GVA) in manufacturing, Maharashtra remaining at the top, Gujarat replacing Tamil Nadu in the second position and West Bengal receding from the third to fourth position. The overall disparity in the shares of different states has slightly declined in 2007–2008 from 1980–1981.

5. In employment terms, Uttar Pradesh replaces Gujarat among the top four states, which account for 48 % in 2004–2005; Uttar Pradesh alone accounts for 16 % of employment, the other three, namely, Maharashtra, Tamil Nadu and West Bengal, 11 % each. There has been little change in the employment shares of different states.

As revealed by the findings as noted above, it is quite clear that states have performed differently from each other in terms of growth of manufacturing industries. What factors account for such differential performance? It may not be difficult and may even not be very useful to try to explain the differences in the levels of industrial development that have historically existed. What may be more interesting and also useful is to attempt an explanation of the changes that have taken place in the period of the past two to three decades, especially since the introduction of economic reforms which removed government regulations on investment and industrial location which, on the one hand, gave freedom and opportunity to states to base their industrial development on specialisation, and on the other, did away with the central government's use of its control and instrumentality to influence investment and industrial location in favour of industrially less-advanced states and regions.

Various factors that could have influenced the differential performance of states in industrial growth during the post-reform period can broadly be divided into the following four broad heads: capital investment, human resources, regulatory framework and infrastructure. A study (Chakravorty and Lall 2007, p. 99–102) looking at the trends in industrial investment of different states over a 7-year period immediately following the introduction of the economic reforms in 1991 found that the process of cumulative causation was in operation insofar as the existing level of industrial investment and activity attracted the new investment. Continuity and clustering were, thus, found to lead to increasing divergence. This observation is supported by findings of our study especially for the period 2001–2009.

That, however, does not mean that other factors may have had no influence on the growth of industrial activity in different states particularly if there was differential progress, in respect of them among states. Let us look at changes in human resource development and regulatory and promotional framework and see if there have been significant differences in terms of changes in them. Going by the Human Development Index (HDI) as the summary indicator of development of human resources, there is a general trend towards an improvement: HDI for country as a whole was estimated to be 0.387 in 1999–2000 and is found to have improved to 0.467 in 2007–2008 (IAMR 2011, p. 24). Similar improvements have taken place in all the states, so much so that eight states have retained the same ranking in 2007–2008, as in 1999–2000, 11 states have changed ranks but only by one or two positions. Only Rajasthan has lost by three positions and Jharkhand and the Northeast (excluding Assam) have gained by four and three positions, respectively. Similarly, there has been a general trend towards easing of regulations and promotion of investment-friendly climate in all the states. Various exercises by the World Bank and industry organisations have attempted measurement of the ease and difficulty of 'Doing Business' in different states and have found significant differences among states. It is, however, not clear whether the degree of 'ease' has changed at different speeds in

the post-reform period. In general, states have competed among themselves in projecting an investment-friendly image and it appears that it has been a zero-sum game rather than any advantage of one state over the others. Gujarat and Maharashtra have, no doubt, offered the 'best' and Uttar Pradesh and West Bengal 'poor' investment climate (World Bank 2004). But that is true of both the pre- and post-reform periods. In fact, some other states like Andhra Pradesh and Karnataka have improved their investment-friendly image. Karnataka has also experienced faster industrial growth, but Andhra Pradesh has not.

One aspect of regulatory framework that has been studied most is labour regulation. A number of studies (e.g. Besley and Burgess 2004; Hasan et al. 2003, Goldar 2011) conclude that states with 'flexible' labour regions, especially those having amended laws and rules to give greater freedom to employers in modes of use of labour, have performed better with respect to industrial growth than others. Several other studies, however, argue that most of these studies are methodologically faulted insofar as they are often based on single legislation and changes in it or on answer to a leading question of impact of labour laws to the complete neglect of other factors such as infrastructure, market, credit, etc. (Bhattacharjea 2006, Reddy 2008, Nagaraj 2011). It appears that better industrial relations climate, no doubt, helped some states (e.g. Gujarat, Andhra Pradesh and Karnataka) to perform better, but the significance of this factor was far overshadowed by other factors, particularly infrastructure. There is, however, no doubt that the labour market and industrial relations regulation were a part of the overall governance and regulatory system which, as a whole, was an important factor in encouraging or stifling industrial growth.

Infrastructure is most widely accepted as the reason for the differential status and growth of manufacturing industry among the states. Analysis has often been attempted to explain such a difference in terms of a single infrastructure item such as banking facilities (Burgess and Pande 2003) and power (Adil 2010). Some other studies have taken several items of infrastructure as independent variables to explain variations in some indicator (e.g. total factor productivity (TFP) in Mitra et al, 2002) of industrial performance and found some of them more important than others. For example, the study mentioned above found investment in primary education, financial mobilisation as reflected in deposits and credit disbursal and power production capacity as the factors significantly influencing industrial productivity. Paul (2011) looked at the impact of banking outreach, physical infrastructure and labour market flexibility on the growth of manufacturing industries across 14 major states of India in the post-liberalisation period (1991–1992/2002–2003) and found that while the first two influenced industrial growth significantly the last has no significant impact.

Often infrastructure items, including physical, economic and social items (like road length and railway length per unit of geographical area, energy consumption, educational facilities, hospitals, banking facilities, post and telecommunications), have been clubbed together to construct an overall 'infrastructure index'. Utilising one such index (constructed by the Centre for Monitoring Indian Economy, CMIE) to examine the relationship between infrastructure and the extent of industrialization (share of manufacturing in the GSDP), it is observed that there is a fairly significant relation between the two. The rank correlation coefficient between the two was 0.36 for the year 1980–1981. It was stronger in 1990–1991 at 0.42 but grew weaker at 0.33 in 2000–2001 (Table 17.8). Yet, it was statistically significant in all three years.

Table 17.8 Infrastructure and level of industrialization. (Source: CMIE and ASI)

States	1980–1981		1990–1991		2000–2001	
	Rank		Rank		Rank	
	Infrastructure Development Index	% share of manufacturing in GSDP	Infrastructure Development Index	% share of manufacturing in GSDP	Infrastructure Development Index	% share of manufacturing in GSDP
Andhra Pradesh	8	6	8	8	12	12
Assam	15	11	13	15	11	16
Bihar	12	10	15	11	17	15
Gujarat	5	4	5	2	6	1
Haryana	4	7	4	4	5	4
Himachal Pradesh	13	16	10	16	10	10
Jammu and Kashmir	11	17	14	17	16	17
Karnataka	10	5	9	5	9	6
Kerala	3	12	2	14	3	14
Madhya Pradesh	17	9	17	7	20	7
Maharashtra	6	2	6	3	8	3
Orissa	14	14	12	13	14	13
Punjab	1	13	1	10	1	9
Rajasthan	16	8	16	12	19	8
Tamil Nadu	2	1	3	1	4	2
Uttar Pradesh	9	15	7	9	7	11
West Bengal	7	3	11	6	13	5
Rank correlation	*0.36*		*0.42*		*0.33*	

Appendix

Table 17.9 Transport and power infrastructure and level of industrialization: regression results. (Source: taken from Papola et al. 2011)

Independent variable/time period	Constant	Coefficient	t-value	p-value	R-square
Dependent variable: % share of manufacturing gsdp to total gsdp					
Railways length_1981	9.696	0.171	1.0200	0.3300	0.0690
Railways length_1991	13.264	0.117	0.7800	0.4500	0.0410
Railways length_2001	12.727	0.157	1.1000	0.2900	0.0750
Road length_1981	14.007	− 0.0003	− 0.0800	0.9360	0.0005
Road length_1991	17.282	− 0.002	− 0.4600	0.6520	0.0149
Road length_2001	16.883	− 0.001	− 0.4500	0.6570	0.0135
Power consumption_1981	7.251	0.044	2.0200	0.0630	0.2258
Power consumption_1991	10.691	0.021	2.0000	0.0660	0.2219
Power consumption_2001	8.251	0.019	3.7700	0.0020	0.4865
Power consumption_2004	9.913	0.015	3.4300	0.0040	0.4399
Dependent variable: per capita manufacturing GSDP					
Railways length_1981	401.280	18.930	1.6900	0.1120	0.1600
Railways length_1991	967.310	16.890	0.8500	0.4080	0.0490
Railways length_2001	1,297.850	27.020	1.0200	0.3230	0.0650
Road length_1981	401.280	18.930	1.6900	0.1120	0.1600
Road length_1991	1,492.590	− 0.140	− 0.3300	0.7480	0.0080
Road length_2001	2,055.700	− 0.120	− 0.3100	0.7620	0.0060
Power consumption_1981	401.280	18.930	1.6900	0.1120	0.1600
Power consumption_1991	275.280	4.260	3.9100	0.0020	0.5220
Power consumption_2001	109.550	4.560	5.4500	0.0000	0.6640
Power consumption_2004	80.470	5.080	5.5200	0.0000	0.6700

Composite indicators are good for summary description but not for identifying the relative importance of different infrastructure items. In most studies, transport and power have been identified as the most critical elements of infrastructure influencing the pace of industrial growth in a region or state. We, therefore, attempted an analysis to explain interstate variations in the level of industrialization and growth of manufacturing GSDP focusing on railways and road length per square kilometre of area as an indicator of transport infrastructure and electricity consumption per capita as an indicator of availability of power. Taking share of manufacturing in GSDP as the indicators of levels of industrialization of a state, we found that it was only the power consumption which had a positive and significant relationship with it, in all the three time points, 1981, 1991 and 2001 for which regression analysis was undertaken. The length of railway line had positive but not significant coefficients. Road length surprisingly came up with a negative coefficient in all the 3 years. Similar results were obtained when the indicator of the level of industrialization was changed to *per capita manufacturing GSDP,* except that the explanatory power of the model improved as also the value of the coefficient of power consumption and the coefficient of road length turned out to be positive in one case, that is, in 1981. (Appendix, Table 17.9). Our attempts to establish dynamic relationships between these items of infrastructure and growth of manufacturing industry in different states by estimating regression of base year infrastructure with growth over the next decade

or to relate growth in infrastructure with growth in manufacturing GSDP over each of the three periods, however, yielded no significant results.

Outcomes of our statistical exercises, however, do not imply that various items of infrastructure do not influence the pace of industrial development in different states. There could be several reasons for the relationship not showing up significantly. *One,* the specification of the variables may not be the most appropriate. *Two,* the quality of data may vary among states. *Three,* some items may not have significantly large variations across states as over the years a larger degree of convergence has emerged with respect to items like facilities for human development, banking, transport and communications among the states. *Four,* where variations are significant, the relationship is also significant. Power availability is one example which is probably a good proxy for all items of infrastructure directly relevant for industry, and it could overshadow the influence of other items. *Five,* after the initial phase of industrialization, infrastructure may continue to be important but its influence is intermixed with that of agglomeration economies. In other words, new industries go where industries exist which are also the states that have better-developed infrastructure. Between states with developed infrastructure but very little industry and those with both developed infrastructure and a good industrial base, the latter attracts more industry than the former. Thus, Kerala with good infrastructure does not attract industry while Gujarat also with high level of industrialization does. Punjab with highly developed infrastructure has a relatively lower level of industrialization, but Maharashtra with relatively lower level of infrastructure development has a high level of industrialization. It appears that the pattern of location of new industrial activity is becoming increasingly complex and requires fresh approaches that go beyond the traditional theory of industrial location to explain it.

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