SOME ASPECTS OF INTER-STATE DISPARITY IN INDUSTRIAL DEVELOPMENT IN INDIA: 1956-65

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SUMMARY. This paper presents simple measures of inter-state disparity in industrial employment in India and its change during the period 1986-85. The main findings are: (a) inter-state disparities in the level of industrialisation have decreased between 1986 and 1985 and (b) there has also been a decrease in between states component of the concentration of the size distribution of factory employment; in plain words, the average factory sizes in the different states have moved closer to one another.

1. Introduction

One of the declared objectives of economic planning in India is 'to bring about a reduction of inequalities in income and wealth and a more even distribution of economic power' (Government of India). The hope was expressed in the draft outline of the Third Five Year Plan that various measures undertaken for this purpose will 'greatly assist the process of reducing old inequalities and preventing new ones arising from the very process of growth' (Government of India). The process of development has also given rise to the problem of regional disparity over and above the problem of inequalities of income and economic power among social classes. In this background objective measures of inter-state disparity in development and changes in such disparities over time may be usefully studied.

In the present paper we have tried to present simple measures of inter-state disparity in industrial employment and studied its change during the period 1956-65.

Choice of the aspects of inter-state disparity examined here was guided by the availability of data. We have chosen the employment in registered factories in different states partly due to its easy availability and partly because this gives a reasonable indication of inter-state disparity. We have also presented measures of concentration of factory employment within different states and also between states; the change in such concentration over the stated period has also been indicated.

In Section 2 a brief discussion of material employed and the choice of the time period selected for the study is given. Section 3 discusses the growth in the number of registered factories and of total employent in different states. An attempt is also made in this section to give a measure of inter-state disparity in industrial employment and to study its change between the two years.

In Section 4 we examine the growth in the number of registered factories and total employment in different states by 12 size classes, classification being made by size of employment. This section also presents some selected measures of concentration

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of employment and its change over time. An attempt is made to resolve the all-India concentration of employment into between states and within states components using the method suggested by Bhattacharya and Mahalanobis (1967).

Section 5 presents a summary of findings.

2. MATERIAL ANALYSED

Measurement of concentration on the basis of employment data is of course not completely satisfactory. Total value of output, sales, assets or capital employed are likely to give a more realistic picture of industry concentration. But unfortunately these data are not available in a form suitable for studies on concentration. We are therefore left with no choice but to use the employment data for such studies. Employment figures for 1956 have been taken from the Labour Bureau publication entitled 'Large Industrial Establishments in India 1956'. This is a compilation of the lists of registered factories prepared by the Chief Inspectors of Factories in different states and gives the average daily employment of individual registered factories. The lists of factories are however not complete. For various reasons the publication for 1956 excluded about 3900 factories accounting for an average daily employment of about 5,70,000 persons. The factories left out included such important industry groups as Iron and Steel Industry (341) and Manufacture of machinery except electrical machinery (360).

For the data relating to 1965, we made use of the Chief Inspectors' lists of registered factories available with the Design Section of the National Sample Survey Department of the Indian Statistical Institute. Registered factories connected with technical institutions not producing for the market and defence installations were excluded.

Although our purpose is to analyse changes in inter-state disparity since independence, we have restricted our study to the period 1956 to 1965, because the main impact of the industrialisation programme on the economy was felt only after 1956. The general index of industrial production (1951 = 100) stood at 136.0 in 1956 and at 250.9 in 1965. Since 1966, as is well known, the economy is in the grip of a recession.

3. INTER-STATE DISPARITY IN INDUSTRIAL EMPLOYMENT

We present below in Table 1 the percentage increase in the number of registered factories, average employment per factory and daily factory employment in each state in 1965 over 1956. For India as a whole, the total number of registered factories increased by 55 per cent and average daily employment increased by 58 per cent. There was practically no change in the average factory size as measured by employment.

About half the states increased their average factory size and in the rest average size decreased. The increase in average size seems abnormal in Bihar. In this state there were 2176 registered factories in 1956 in the lowest size group viz.

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TABLE 1. PERCENTAGE INCREASE IN NUMBER OF FACTORIES, AVERAGE EMPLOYMENT PER FACTORY AND TOTAL FACTORY EMPLOYMENT BY STATES: 1986-6.

		p.c. ir	norease in 1965 over	1956
sl. no.	states	no. of factories	average employ- ment per factory	average daily employment in factories
(1)	(2)	(3)	(4)	(5)
1.	Andhra Pradesh	28.63	3.70	34.04
2.	Assam	162.87	-33.33	75.45
3.	Bihar	-49.71	316.00	107.29
4.	Gujarat	51.78	-12.96	31.91
5.	Korala	54.55	20.00	84.96
6.	Madhya Pradesh	12.92	-9.47	1.25
7.	Madras	8.41	28.07	39.06
8.	Maharashtra	49.57	3.09	53.32
9.	Mysore	185.08	4.23	196.04
10.	Orissa	177.10	17.65	227.70
11.	Punjab	202.82	-9.30	169.46
12.	Rajasthan	158.81	-14.44	120.33
13.	Uttar Pradesh	117.89	-29.32	55.63
14.	West Bengal	103.99	36.21	48.75
15.	Delhi	137.81	7.41	155.28
16.	other regions	211.45	-7.14	189.78
17.	India	55.07	1.14	58.35

factories employing on an average one to four persons daily. But in 1965, the number of factories in this group was only 27. Most of the factories in this group belonged to the grain mills industry and the reason for such a big drop in their number in 1965 could not be ascertained. The table also shows that percentage increase in total employment in the old industrial states such as Maharashtra and West Bengal have been smaller than but close to the all-India figures, but relatively backward regions like Orissa, Rajasthan, Bihar and other regions (mostly centrally administered areas) have shown remarkable increase. This feature may be taken as an indication of reduction in inter-state disparities in factory employment.

Changes in inter-state disparity of factory employment can be better understood if the state-wise distribution of factory employment is seen against the statewise distribution of total population. The relevant information is presented in Table 2 below.

Table 2 gives a picture of relative industrialisation of different states as well as of the changes over time. It also enables us to calculate a simple index of interstate disparity in industrialisation.

SANKHYÄ: THE INDIAN JOURNAL OF STATISTICS: SERIES B TABLE 2. INTER-STATE DISPARITY IN FACTORY EMPLOYMENT

	percentage	share in 1956	percentage i	share in 1985	absolute diff	ference P-P'
states	population (P)	factory employment (P')	population (P)	factory employment (P')	1956	1965
Andhra Pradesh	8.44	5.81	8.03	4.91	2.63	3.12
Assam	2.56	3.07	2.76	3.39	.61	.63
Bihar	10.58	3.39	10.53	4.44	7.19	6.09
Gujerat	4.60	10.98	4.76	9.13	6.38	4.37
Jammu and Kashmir	.86	.18	.78	. 22	. 68	.56
Kerala	3.83	5.69	3.86	6.63	1.86	2.77
Madhya Pradesh	7.19	5.59	7.40	3.57	1.60	3.83
Madres	8.08	9.33	7.44	8.18	1.25	.74
Maharashtra	8.98	20.07	9.07	20.29	11.99	11.22
Myeore	5.41	2.04	5.35	3.81	3.37	1.54
Orissa	3.97	. 67	3.96	1.48	3.40	2.48
Punjab	4.56	2.35	4.76	4.00	2.22	.76
Rajasthan	4.48	1.08	4.68	1.49	3.40	3.19
Uttar Pradesh	17.12	7.07	16.60	6.94	10.05	9.72
West Bengal	7.62	20.63	8.06	19.35	13.01	11.29
other areas	1.70	1.25	1.88	2.17	.45	. 29
total	100.00	100.00	100.00	100.00	69.99	62.00

Source : Population figures from Bulletin on Food Statistics, 16th issue 1906, page 6, Table No. 1.4.

Let P_t and P_t represent the percentage of total (all-India) population and total (all-India) factory employment covered in the i-th state. Then $P_t - P_t$ indicates the level of industrialisation in that state relative to the all-India level. A positive difference would indicate lower level of industrialisation and a negative difference would indicate higher level of industrialisation compared to the country as a whole. Clearly, $\sum_i |P_t - P_t|$ i.e. the sum of the absolute differences between P_t and P_t should give an index of inter-state disparity of industrialisation. If all the states are equally industrialised i.e. if the state-wise distribution of factory employment is egalitarian, then P and P' should be equal for each state and consequently $\sum_i |P_t - P_t'|$ should be zero. The maximum value that $\sum_i |P_t - P_t'|$ can take is, of course, 200.

Our calculations reveal that this index was 62.60 in 1965 as against 69.99 in 1966 showing a reduction in inter-state disparity in the distribution of factory employment. It should, however, be remembered that apart from the stops taken for industrialisation, the differential rates of population growth may also have affected this index. We also observe from Table 2 that the shares of total factory employment in the relatively industrialised states like West Bengal, Gujarat, Maharashtra and Madras declined in 1965 as compared to 1956 whereas the shares of relatively backward regions like Assam, Kerala, Orissa, Punjab and Rajasthan and 'other areas' increased during this period.

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4. THE SIZE DISTRIBUTION OF FACTORY EMPLOYMENT

Size distribution of employment is likely to be affected by addition of new firms and expansion of existing firms during a period of economic growth. Whether the resulting distribution will be more skewed or less will depend on the existence of the economy of scale for existing firms and also on the techniques of production chosen in the expanding sectors. While no detailed investigation of this aspect will be undertaken here, we shall, nevertheless, present some selected measures of inequality for different states and for all-India. The changes in these measures over-time will also be indicated.

For the purposes of our analysis factories have been classified into 12 size groups and percentage distribution of factories and total factory employment in each of the 12 size groups have been computed for all-India as well as for each state, considering all industries together. These distributions are shown in Appendix Tables A.1 and A.2.

The size distribution of factory employment for all-India (all industry) is shown below in Table 3 separately for 1956 and 1965.

TABLE 3. PERCENTAGE DISTRIBUTION OF FACTORIES AND OF TOTAL FACTORY EMPLOYMENT BY SIZE GROUPS OF FACTORIES IN 1956 AND 1965: ALL-INDIA, ALL-INDUSTRIES COMBINED

		1	956	1	965
sl. no.	size group (no. of workers)	p.c. of factories	p.c. of total factory employment	p.c. of factories	p.c. of total factory employment
	(1)	(2)	(3)	(4)	(5)
1.	1 - 4	8.63	. 25	3.21	.11
2.	5 - 9	11.51	1.02	10.73	.92
3.	10 - 19	24.81	4.00	30.48	4.77
4.	20 - 29	14.78	4.04	15.67	4.04
5.	30 - 49	14.89	6.85	14.52	6.26
6.	50 - 99	13.38	10.48	12.80	9.84
7.	100 - 249	7.28	12.23	7.32	12.03
8.	250 - 499	2.02	8.23	2.48	11.81
9.	500 - 999	1.28	12.81	1.39	10.78
10.	1000 - 2499	1.04	22.11	.94	16.13
11.	2500 - 4999	.30	11.90	.32	12.14
12.	5000 and above	.08	6.08	.14	11.17
13.	all sizes	100.00	100.00	100.00	100.00

The table shows very high concentration of employment in both the years but there is no clear indication of any change in concentration during the period. The information contained in Table 3 and in Appendix Tables A.1 and A.2 have been summarised with the help of the familiar Lorenz curve analysis. The Gini-Lorenz concentration ratio as well as the shares in employment of bottom 50%, top 10% and top 1% of factories have been computed for all-India and also for each state. These sum-

[&]quot;There is also the possible effect of amalgamations etc. and the 'death' of old firms.

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mary measures are put together in Table 4 below. It should be remembered that these relate to all-industries taken together, and not to particular industry or group of industries.

TABLE 4. SELECTED MEASURES OF CONCENTRATION OF THE DISTRIBUTION OF FACTORIES BY SIZE OF EMPLOYMENT WITHIN DIFFERENT STATES OF INDIA-1965 AND 1965 ALL INDISTRIES COMBINED

					percents	ge share of		
state	Loren	z ratio	botto	m 50%	top	10%	top	1%
	1956	1965	1956	1965	1956	1965	1956	1965
(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)
Andhra Pradesh	. 653	.690	11.95	10.19	58.48	63.17	27.65	25.00
Assam	.588	. 566	11.03	10.10	41.97	34.97	10.61	7.62
Bihar	.819	. 806	4.55	5.92	75.73	78.13	44.55	42.53
Gujarat	.775	.750	6.50	7.64	72.85	69.45	20.97	24.90
Korala	.627	.735	10.84	5.71	48.27	67.54	9.61	7.98
Madhya Pradesh	.618	.719	15.11	9.33	55.21	66.48	31.40	34.88
Maharashtra	.766	.774	7.04	6.92	71.02	70.05	39.36	34.57
Uttar Pradesh	.778	.738	5.58	7.70	72.18	66.76	25.65	24.94
Madras	.713	.742	9.28	7.84	64.67	69.23	34.56	32.16
Orissa	.715	. 656	9.57	11.38	65.12	59.45	42.03	39.27
Punjab	. 628	.703	14.62	10.30	54.70	62.58	25.24	31.98
Rajasthan	.719	.732	8.89	8.11	66.13	67.87	18.37	27.47
Mysore	.701	.741	10.50	8.86	65.01	69.36	33.34	37.15
West Bengal	.794	.807	5.48	5.19	77.63	76.63	19.18	31.58
Delhi	.637	. 639	12.65	13.54	58.00	58.97	37.04	34.36
all India	. 765	.757	6.65	7.24	70.00	69.80	31.16	32.58

The first thing that attracts our notice in this table is that concentration of factory employment is fairly high in all the states. Assam shows the lowest Lorenz ratio (.59) and Bihar the highest (.82) in 1956. In 1965, the highest Lorenz ratio was recorded by West Bengal (.82) and as in 1956 the lowest ratio was found in Assam (.57). The all-India ratio remained practically unchanged at .76.

From the point of view of 'dominance' of a few units, shares in employment of top 10 and 1 per cent of firms are more revealing than the Lorenz ratios. It is observed that 25 to 43 per cent of total factory employment is controlled by 1 per cent of factories in 13 states out of 15 considered here.

In Table 5 we have grouped the states in three size classes of their Lorenz ratios which, for our purposes, may be called low, medium and high concentration classes within the observed range. The table shows that the fifteen states were equally distributed among the three classes in 1956 but in 1965 as many as ten states have clustered in the medium concentration group. Inter-state differences in concentration ratio seem to have slightly reduced by 1965.

Finally, we made an attempt to resolve the all-India concentration of the size distribution of factory employment into between states and within states components by using the method suggested by Bhattacharya and Mahalanobis (1967).

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TABLE 5. DISTRIBUTION OF STATES BY DEGREE OF CONCENTRATION OF SIZE DISTRIBUTION OF FACTORY EMPLOYMENT: ALL INDUSTRIES COMBINED

Lorenz ratio	1956	1965	
(1)	(2)	(3)	

- .55 .65 Assam, Kerala, Madhya Pradesh, Punjab, Assam, Delhi. Delhi.
- .65 .75 Andhra Pradesh, Madras, Orissa, Rajasthan, Andhra Pradesh, Gujarat, Kerala, Madhya Mysore.

Pradesh, Uttar Pradesh, Madras, Orissa, Punjab, Rajasthan, Mysore.

.75 - .85 Bihar, Gujarat, Maharashtra, Uttar Pradesh, Bihar, Maharashtra, West Bengal. West Bengal.

We suppose that within each state, the size distribution of factories become perfectly egalitarian because all factories assume the existing average size of factories in that state. The all-India size distribution of factories in this hypothetical situation gives the between states Lorenz curve and the associated measures of concentration. The between states Lorenz ratio was found to have changed from .275 in 1956 to .203 in 1965. It will be recalled that the all-India Lorenz ratio is about 0.76 in both years. So between states disparities decreased both in absolute sense and also relative to overall disparity.

5. CONCLUDING REMARKS

Our main finding may be summarised as follows:

- (a) Inter-state disparities in the level of industrialisation has decreased between 1956 and 1965 and (b) there has also been a decrease in between states component of the concentration of the size distribution of factory employment; in plain words, the average factroy sizes in the different states have moved closer to one another. We have already mentioned the limitations of data in Section 2. Here, we want to emphasize that the level of industrialisation measured in terms of employment in registered factories is not a very satisfactory index.
 - As regards methodological limitations we would like to mention that :
- (a) We have not analysed the change in concentration of the size distribution into components attributable to births, deaths and amalgamations of firms and changes in sizes of surviving firms. (Hart and Prais, 1956). This could be conveniently done if variance of log-sizes were used as measure of concentration.
- (b) We have been unable to study particular industries, owing to shortage of time. The work is very much under way.
- (c) We are aware of the limitations of the Lorenz curve type of analysis of concentration in business or industry (Blair, 1956; Hall and Tideman, 1967). We propose to use the absolute concentration ratio, e.g. share of the largest 4 or 5 firms, in our subsequent work in the area.

Appendia TABLE A.1. PERCENTAGE DISTRIBUTION OF REGISSION

- 1	TABLE A.1.		CENTAC	E DIST	PERCENTAGE DISTRIBUTION OF REGISTERED FACTORIES BY SIZE OF EMPLOYMENT	N OF R	EGISTE	RED FA	CTORIES	BY SIZ	E OF EN	PLOYM	ENT		
	state	Year				size of	factorics	by num	oer of wo	size of factories by number of workers employed	loyed				1
			<u>:</u>	5.9	61.01	20.29	30.49	50.99	100.249	250.499	666-009	1000	4990	5000 & above	tota
	(1)	(5)	(3)	(+)	(9)	(9)	(2)	(8)	(g)	(10)	(11)	(12)	(13)	640	(13)
=	Andhra Pradesh	1956	1.88	12.42	30.04	16.90	19.91	9.98	3.83	1.25	1.02	0.49	0.16	0.03	100.00
ci	Аяваш	1956	7.79	11.50	17.46	10.09	13.22	18.87	20.69	2.82	0.08	0.51	U	Li	100.00
છ	Bihar	1956	67.35	15.00	34.85	16.72	5.43	4.30	1.69	0.61	5.5	0.39	0.12	0.21	100.00
÷	Gujarat	1956	1.47	8.25	32.31	15.98	15.91	11.96	8.36	1.36	0.80	2.68	0.49	0.00	100.00
2	Korala	1956	0.15	7.68	11.04	20.86	13.00	24.27	12.40	5.49	4.8 9.9	0.75	0.0	H	100.00
9	Madhya Pradesh	1956	1.03	3.58	12.92	30.82	13.89	29.78	14.07	1.70	0.73	0.78	0.42	0.18	100.00
į.	Maharashtra	1956	1.25	11.42	32.36	14.28	14.62	13.96	7.94	1.85	0.68	0.82	0.56	0.26	100.00
œ	Uttar Pradesh	1966	2.84	10.03	24.95	14.19	17.95	11.48	9.37	3.23	3.23	1.98	0.54	0.21	100.00
6	Madras	1956 1965	3.02	14.28	33.13	15.03	15.73	9.99	5.52	1.46	0.72	0.89	0.00	0.06	100.00
o	Orissa	1956	5.08	10.94	28.52	18.36	14.84	16.41	3.91	1.16	0.97	0.49	0.78	0.12	100.00
	Punjab	1956	3.08	16.86	35.43	14.50	13.45	7.48	4.92	1.05	0.53	0.46	11	0.05	100.00
ci	Rejasthan	1956	3.46	4.78	32.63	28.36	14.33	15.22	8.06	2.39	1.79	2.09	0.48	11	100.00
ei.	Мувоге	1956	0.86	5.30	33.06	22.19	13.56	12.28	6.49	9.30	= 3	0.86	0.25	0.13	100.00
4	West Bengal	1956	1.37	7.07	16.59	12.68	21.89	19.61	9.94	3.28	3.55	2.57	0.48	170	100.00
ı.i	Delhi	1956	0.94	6.81	35,44	18.71	17.97	10.02	5.29	0.38	0.38	0.19	0.38	0.16	100.00
	others	1956	12.05	4.00	12.65	12.05	15.06	12.05	6.63	3.01	0.00	0.60	0.60	0.19	100.00
7.	all-India	1956 1985	8.63 3.21	11.61	30.48	17.78	14.89	13.38	7.28	0 0 0 1 4 8	1.38	1.04	0.30	0.08	100.00
										1					

TABLE A.2. PERCENTAGE DISTRIBUTION OF WORKERS IN REGISTERED FACTORIES BY EMPLOYMENT SIZE OF FACTORIES

	4.00					size of	size of factories by number of workers employed	by numb	er of wo	rkers emp	hoyed				
			1	9-9	10-13	20.29	30.49	20.90	100-249	250-499	500-888	1000-	2500-	5000 & above	
	(3)	Ð	(3)	(4)	(5)	(9)	6	(8)	€	(10)	£	(13)	(13)	(14)	(19)
-	Andhra Pradesh	1956	0.11	01.1	8.07	7.36	14.30 8.98	83	10.18	7.97	8.8	12.88	10.28	2.36	00.00
oi	Assam	1956	0.12	0.91	3.33	3.08	5.86	15.63	37.55	9.98 45.13	17.08	6.47	11	11	100.00
က်	Bihar	1956	0.05	3.91	1 25	25.	5.37	0.87	20	8.0	11.70	17.62	6.53	27.68	8.00
÷	Gujarat	1956	0.05	0.00	5.00	3.53	5.65	8. G8	9.23	12.94	6.67	43.64	12.70	2.08	100.00
ó	Kerala	1956	0.00	0.10	1.36	3.27	4.18	6.77	14.10	7.38	22.03	8.19	123	11	100.00
ó	Madhya Pradosh	1956	0.00	0.28	3.76	4.65	3,43	18.55	16.84	10.01	5.13	12.64	10.06	10.47	100.00
4	Meharashtra	1956	0.0	1.18	4.46	3.30	5.98	9.64	10.43	6.65	5.00	14.51	19.99	18.18	100.00
œ	Uttar Pradesh	1956	0.00	0.56	5.7	3.98	5.19	6.16	11.62	9.70	17.17	21.36	12.18	10.77	100.00
6	Modras	1956	0.24	1.43	6.36	6.27	10.34 0.03	9.38	13.02	9.10	9.05	16.53	3.49	11.78 8.93	100.00
0	Oriesa	1956	0.23	1.28	6.30	4.91	9.34	13.83	3.50	7.00	1 8	7.78	42.48	22.27	88
Ξ	Punjab	1956	0.22	3.0	11.48	8.03	9.74	16.14	16.67	7.92	8.53	16.63	11	17	100.00
13.	Rajasthan	1956	0.00	0.38	3.24	3.85	8.09	9.92	13.78	8.18 8.01	13.17	38.40	17.78	П	88
13.	Mysore	1956	9.0	0.56	6.62	7.15	6.95	14.37	10.65	3.81	0.56 9.66	15.87	9.88	12.02	100.00
ž	Wost Bengal	1956	0.03	0.33	2.30	1.62	4.25	6.93	8 9	9.43	23.86 8.40	35.13	12.07	18.69	90.00
16.	Delhi	1956 1965	90.0	0.96	10.61	10.60 8.65	11.56	12.66	9.1	1.99	0.37	8.79 2.80	6.08	17.66	8.8
18.	others	1956	0.50	2.03	2.49	4.32	7.96	11.40	13.31	14.83	6.19	14.18	22.73	14.82	90.0 100.0
17.	all-India	1956 1965	0.25	1.02	4.4	44	6.26	9.84	12.23 12.03	8.23 11.81	12.81	22.11 16.13	11.90	6.08	100.00

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