The Non-Household Sector in Indian Manufacturing

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Part A
Nature of the DME sector

I *Introduction*

Indian Manufacturing is characterized by the prevalence of a large "unorganized sector' existing side by side with the formal or organized sector. The Indian statistical authorities distinguish four types of establishments. There are three sub-categories within the unorganized sector; (i) Own-account manufacturing enterprises (OAME) which are household enterprises making use only of family labour; (ii) Non-directory manufacturing establishments (NDME) who employ at least one wage (hired) worker and have between 2-5 workers in total and (iii) Directory manufacturing establishments (DME) employing between 6-9 workers in total of which at least one would be a hired worker. These three sub-categories co-exist with the formal or organized sector which are statistically defined (by the Factory Act) to be employing ten or more workers. Table 1 provides a statistical profile of the manufacturing sector in India distinguished by the above four categories of establishments. The dominance of the household sector as well as its low productivity is apparent from this table.

Table 1: Employment and Value Added in Manufacturing by Type of Establishment 2000-1

	OAME	NDME	DME	Organized
Distribution of Employment (% of all manufacturing)	55.9	12.4	14.4	17.3
Mean all workers in category	1.7	3.2	10.0	63.9
Mean Hired workers in category	0	1.8	7.8	60.9
Distribution of Value Added (% of all manufacturing)	10.3	6.1	8.0	76.6
Mean VA/Worker in category	Rs. 6,929	Rs. 18,479	Rs. 20,800	Rs. 163,775
Labour Productivity (Organized =100)	4.2	11.3	12.7	100

Sources: Unit level data of 56th round of NSSO and ASI unit level data of 2000-1.

While some writings on Indian manufacturing draw the line of the formal sector at the ASI sector (where the workers are covered by the Factories Act), it will be seen from Table 1 that this line does not distinguish the very large "household sector" in Indian manufacturing (where the operations are largely carried out by family labour). From the non-household sector—the establishments making use of hired wage labour. It is seen that the mean number of hired workers in the so-called DME sector is large. The following table gives the distribution of employment classified by the total number of workers and by the number of hired labour used.

Table 2: Percentage Distribution of Employment in DME classified by total number of workers and the number of hired workers in selected industries

Industry	Full time worker	Part time worker	all worker	hired worker	working owners	other workers	share of part time worker	share of hired worker
Food & Beverages	1,167,381	150,169	1,317,549	992,840	197,569	127,141	11.4	75.4
Textiles	1,388,762	98,716	1,487,478	1,151,666	193,046	142,766	6.6	77.4
Wearing Apparels	426,235	26,779	453,014	364,402	63,410	25,202	5.9	80.4
Chemicals	246,059	10,211	256,270	193,779	34,277	28,214	4.0	75.6
Non-metallic minerals	831,381	55,288	886,670	754,889	73,807	57,973	6.2	85.1
Fabricated Metals	414,476	12,203	426,679	342,490	59,832	24,357	2.9	80.3
Machinery & equipment n.e.c.	245,617	2,636	248,253	212,447	29,603	6,203	1.1	85.6
Furniture & Fixtures	846,983	24,175	871,158	759,460	87,361	24,337	2.8	87.2
Manufacturing	6,553,801	422,294	6,976,093	5,587,576	887,347	501,174	6.1	80.1

Source: Unit Level data of 62nd round of NSSO (2005-6)
Note: For description of industry code, see Appendix I.

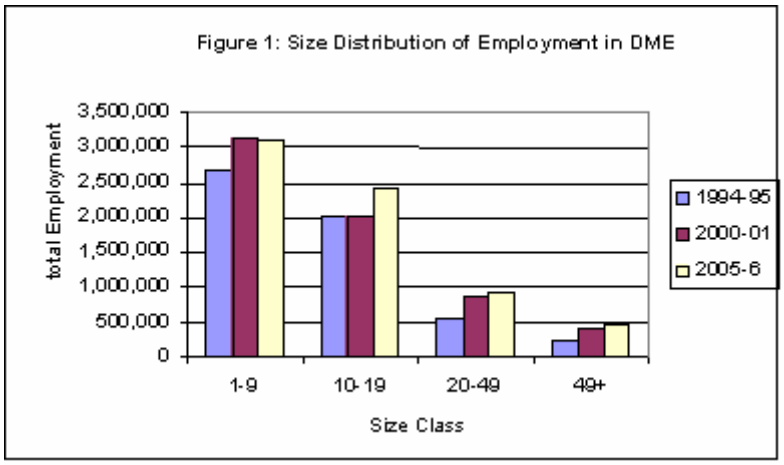
The data emphasize the fact that the DME sector contains establishments in which the use of hired labour is not just marginal. Thus a sizable body of manufacturing employment—just a few percentages points less than those in the ASI sector—are in non-household units depending on hired labor, even if the latter are not covered by the Factories Act. A meaningful study of size distribution of manufacturing in the non-household sector should include these so-called DME units, even if they exclude the NDME units which can be considered to be an extension of the household sector (with only marginal use of hired labour)

An added reason for including the DME units in our study of non-household manufacturing is that it would bring India in line with international comparison. For most countries the lower cut-off point for non-household manufacturing is 5 workers.

II The Size Distribution of Employment in the DME sector

The legal definition of the DME sector is that it contains units with 6-9 workers, with at least one full-time hired worker. In practice this legal definition has not been strictly enforced. A growing number of units employing more than 9 workers have been allowed to be outside the purview of the registration needed for the ASI sector. This does not mean that the legal authorities have ignored the law indiscriminately. Rather, as we shall soon see, this relaxed enforcement has been confined to only a very small number of industries in which the use of mechanized methods of production is minimal.

Figure 1 gives the distribution of employment by size groups within the DME sector at different dates. The proportion of employment in the DME sector is substantial in the 10-19 size group. Also the proportion above the legal limit seems to be increasing over time.



A remarkable feature of this sector is that the employment in DME units above the legal size is largely confined to just three industries (defined at the 2-digit level). Table 3 shows that these industries together account for 43 per cent of all DME employment in the 10-19 size group and 75 per cent in the 20 & above group.

TABLE 3: Share of These Industries in Each Size Class of DME Employment in 2005-6

Industry	6-9	10-19	20-49	50 & above	20 & above
Textiles	19.7	26.2	21.8	8.1	17.2
Non-Metallic Minerals	6.5	8.3	25.5	51.3	34.2
Furniture & Fixtures	10.3	8.7	24.7	22.7	24.0
Combined	36.6	43.2	71.9	82.2	75.4

Source: Same as Table 2.

A second notable feature of DME employment is that the increase in the employment size of DME units does not lead to any increase in the labour productivity in the sector. In fact as the data brought together in Table 3 show that the productivity of the DME units remains at the same 10 per cent level of the large (500+) ASI units whatever their size category and considerably below the **small (**10-49) ASI units.

TABLE 4 (at 2005-6 prices with GVA in Rs. Lakh and productivity Rs. Per worker)

ASI 2004-5				
Size Class	Workers	GVA	productivity	Relative Productivity, 500+=100
1-9	149,111	147,297	98,784	15
10-49	1,391,759	2,212,020	158,937	25
50-99	854,750	1,873,798	219,227	34
100-199	1,055,396	2,913,300	276,039	43
200-499	1,474,708	5,437,348	368,707	57
500+	3,018,600	19,533,187	647,094	100
Total	7,944,304	32,116,951	404,276	62
DME 2005-6				
Size Class	Workers	GVA	productivity	Relative Productivity, 500+=100
1-9	3,123,613	1,545,205	49,469	8
10-19	2,397,130	1,235,811	51,554	8
20-49	933,392	435,113	46,616	7
10-49	3,330,522	1,670,923	50,170	8
50+	474,136	251,615	53,068	8
Total	6,928,271	3,467,744	50,363	8

Source: Unit level NSS data of 62nd round and ASI unit level data of 2004-5.

We conclude: the DME establishments which are larger than the employment size of the legal maximize are **not** employing any significantly different level of technology than the smaller units. In fact they are mostly found in those industries which compete successfully with a low level of technology. The expansion of these units above the legal maximum is of the "horizontal" kind -- increasing the number of the same type of simple capital equipment as those used by the smaller units. Thus they do not attract the attention of legal authorities enforcing the boundaries of the ASI sector.

In fact further details for the three industries which account for the bulk of the employment in the 10+ DME establishments show that labour productivity in fact *falls* in larger size classes (Table 5). This suggests that that the larger units do not use substantially larger

proportion of part-time workers and possibly it indicates inefficient organisation of production beyond its scale size.

TABLE 5: Labour Productivity across Size Groups of DME in 2005-6 (at current prices)

Industry Code	1-9	10-19	20-49	50 & above
Textiles	34,276	37,446	42,159	34,715
Non-Metallic Mineral	61,574	43,943	50,890	35,043
Furniture, Jewellery etc.	55,829	73,143	30,651	26,887

Source: Same as Table 2.

III Review of the Problem of the Missing Middle in Non-Household Manufacturing

Given the size distribution of DME employment as discussed in the previous section, the nature of the problem of the 'missing middle' as presented in Chapter 9 of Mazumdar and Sarkar (2008) has to be revised somewhat. In the previous analysis we had assumed all DME employment was in the legally defined size group of 6-9 workers. The new information presented in last section leaves us with two options about how to present the size structure of Indian industries in the non-household sector, comprising the DME and the ASI units. We could *either* merge the reported numbers in both the DME and the ASI sectors in the 6-9 and 10-49 size groups; *or* report the DME employment separately irrespective of their size, considering the special nature of the low productivity industries in which even the larger DME units are found. There is merit in both types of portrayals. But given the point established above that there is a 'qualitative gap' between the technologies separating the DME from the ASI sector, it is probably more meaningful to go with the picture of the size structure presented in Figure 2—with the important caveat that the bottom bar in Figure 3 should be more correctly labelled as the 'DME enterprises' rather than the 6-9 size class.

Figure 2 presents the picture based on the first approach, while Figure 3 portrays the size distribution based on the second approach (where the size class 6-9 in fact contains all DME employment irrespective of size And ASI size class 1-9.

It is seen that the picture of the size distribution with a 'missing middle' is conspicuous in both graphs, but that the lower mode is higher when we consider the actual employment sizes of the DME units covered, rather than the legal definition of a maximum of 9 workers for such units. The striking fact about Figure 3, however, is that, with comparable definitions, the size structure in India manufacturing around 2005 is almost the same as was given in Mazumdar and Sarkar (2008) for 1989-90. If anything the incidence of the 'missing middle' has been accentuated over the 15-year period with the DME sector now accounting for rather more than

45 per cent of total non-household manufacturing employment compared to a little over 40 per cent in 1989-90. The only other significant change is that at the upper end of the size distribution there has been some redistribution of employment from the very large 500+ units to the 200-499 size group.

Figure 2: Size Structure of Indian Manufacturing Employment 2005-6 (with reported employment size of both DME and ASI units)

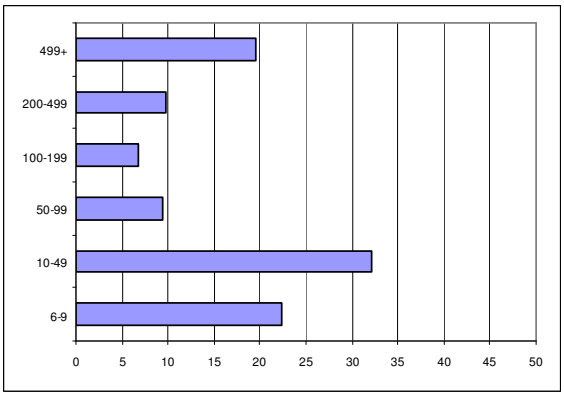
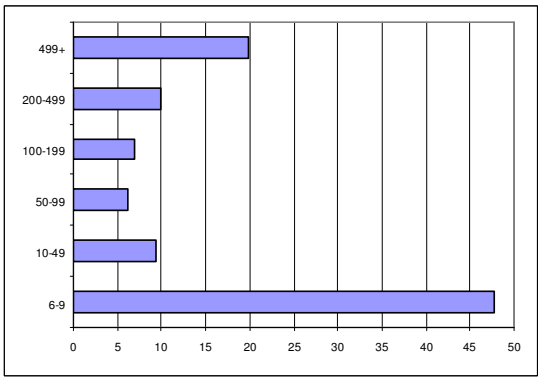


Figure 3: Size Structure of Indian Manufacturing Employment 2005-6 (with all DME employment included in 6-9 size group)



Note: The data are for DME 2005-6 and ASI 2003-4. The first graph is based on actual employment in different size groups in both DME and ASI. The second graph is as explained – all DMEs are considered to fall in the 6-9 employment group and all ASI establishments are considered to have at least 10 workers.

IV A comparison of the Industrial Composition of DME and ASI establishments: Product Market Segmentation

It has already been noticed that the industries in which the larger DME units (10 and above size groups) are to be found are few in number. It is now necessary to expand the enquiry

to a more detailed level of analysis to see how the DME units compare with the ASI sector in terms of their industrial composition. For this purpose we undertook a detailed comparison of employment in the two sectors at the 5-digit level of the industrial classification. The questions of primary interest are: (i) How far are the DME industries overlapping with the ASI ones? How many of these 5-digit industries are present both in the DME and the ASI sectors? (ii) What are the proportions of employment in such 'overlapping' industries, and how much is the overlap? (iii) Are their any significant trends in the direction of the 'overlap' i.e., what can we say if the DME industries competing more or less with ASI industries in recent years?

In table 6 we have picked up the industries in which both DME and ASI units have substantial representation. It should be noted that the data we have for ASI is for the year 2003-4 which more or less at the mid-point of the two DME surveys of 2000-1 and 2005-6. It will be seen in several industries there are substantial changes in DME employment over the span of the two surveys. But only in a few cases do we see a spectacular change in DME employment. The industries which have registered a sharp increase in DME employment are: rice milling; processing of edible nuts; weaving of man-made fibres; knitted cotton textiles; printing; and diamond cutting. On the other hand sharp fall in DME employment is observed in manufacture of *bidi*; weaving of cotton fabrics; garments; and footwear;. It is noteworthy that some of these declining industries for DME employment are in fact older ones in which the presence of DME units had been substantial. It remains to be seen if these reported trends continue in subsequent surveys. Over-all, however, the growing industries in the DME sector have outweighed the decline in the shrinking ones, so that for the share of the overlapping industries picked up in our analysis in all DME employment has virtually remained constant at around 40 per cent. The corresponding share of these industries in the ASI sector is 27 per cent of the total.

These proportions give an idea of the extent of product market segmentation in Indian manufacturing. The ASI sector has rather more than two-thirds of its employment in industries which (at our detailed 5-digit level) have only a small presence in the DME sector. On the other hand the DME units have a larger proportion of their employment in industries (around 40 per cent) which 'overlap' with ASI products. Two points need to be emphasized. First, overlapping industries still amount to significantly less than half of employment in manufacturing, with the ASI units showing a much higher degree of specialization in products which only this sector can produce. Second: there is considerable churning of products within the DME sector, but overall

the total share of employment in the overlapping industries has not changed much in the early years of this century. Note that our estimate of the overlapping industries provides only an outer limit. Although the 5-digit level of classification is quite a detailed one, quality variations of the products cannot be captured in this classification. To the extent that the DME units can be expected to produce a larger share of their products for the lower end of the market, the overlapping industries of equivalent quality would be much less.

Table 6: Employment in Overlapping Industries

Industry 5 Digit Code	ASI Employment	DME Employment		Description of Industry
	2003-4	2000-1	2005-6	
15312	210,701	67,376	91,016	Rice milling
15493	198,143	16,897	310,690	Processing of edible nuts
16002	418,420	60,565	18,471	Manufacture of bidi
17115	61,900	468,019	372,635	Weaving, manufacture of cotton and cotton mixture fabrics
17118	58,607	101,197	194,168	Weaving, manufacturing of man-made fiber and man-made mixture fabrics
17121	88,539	38,728	66,354	Finishing of cotton and blended cotton textiles
17301	99,960	54,291	71,263	Manufacture of knitted and crocheted cotton textile products
18101	348,218	314,769	247,856	Manufacture of all types of textile garments and clothing accessories
19201	78,237	47,064	24,093	Manufacture of footwear except of vulcanized or moulded rubber or plastic
22219	45,752	66,341	90,753	Printing and allied activities, n.e.c
24231	27,992	75,588	5,776	Manufacture of chemical substances used in the manufacture of pharmaceuticals
25209	79,003	60,849	36,472	Manufacture of other plastic products
26931	99,981	904,900	634,569	Manufacture of bricks
26960	78,910	106,025	62,799	Cutting, shaping and finishing of stone
34300	212,021	41,977	55,106	Manufacture of parts and accessories for motor vehicles and their engines
36912	3 9,415	280,646	430,920	Diamond cutting and polishing and other gem cutting and polishing
Total	2,145,799	2,705,232	2,712,940	16 overlapping industry groups
All Manufacturing employment	7,735,049	6,454,121	6,928,271	Includes all industries in sector
Percentage share of overlapping industries in All manufacturing	27.7	41.9	39.2	Ratios of the last two rows

Source: Unit level data of different NSS rounds and ASI 2003-4.

A detailed examination of DME employment for the two dates also enabled us to identify some new 'growth points' for emerging industries which are becoming important in this sector.

These industries, presented in Table 7, which in 2000-1 had just about the same volume of employment in the DME sector as the ASI units in 2003-04, had increased its volume of employment in the former to three times the employment in the latter.

Table 7: Newly emerging DME industries

New Industries where DME employment>50,000 in 2005-6

Industry 5 Digit Code	ASI Employment	DME Employment		Description of Industry
	2003-4	2000-1	2005-6	
19121	734	4,894	50,266	Manufacture of travel goods like suitcases, bags and holdalls etc.
24291	47,692	32,367	61,802	Manufacture of matches
26954	1,330	12,248	66,132	Manufacture of R.C.C. bricks and blocks
28996	4,505	20,699	53,842	Manufacture of hollow-ware, dinnerware or flatware
29299	26,512	15,354	71,295	Manufacture of other special purpose machinery, equipment n.e.c.
35923	25,123	12,577	59,833	Manufacture of parts and accessories for bicycles, cycle-rickshaws and invalid carriages
Total	105,895	98,139	363,170	

Source: Same as Table 6.

COMPARISON OF THE SECTORS IN TERMS OF VALUE ADDED

The analysis given above is in terms of employment. The low productivity in the DME sector relative to the ASI already noted implies that the share of the former in value added would be much lower than that of employment. As we have already seen in Section I above, in 2000-01 the organized sector of Indian manufacturing produced 77 per cent of value added in all manufacturing although it employed only 17 per cent of the labour force in the sector. We classified the 65 sub-sectors of Indian manufacturing at the intersectoral transaction matrix (IP-OP) level into four groups (taking the organized and the unorganized sub-sectors together): (i) those in which the organized sector was accounted for nearly the all of the value added (80 to 100 per cent); ii) those in which the organized sector produced the major part of the value added (50-79 per cent; iii) those in which the two sub-sectors are equally important and iv) those which are dominated by the unorganized sector. The results are given in Table 8.

GLOBALIZATION AND INDIAN MANUFACTURING

The dominance of the organized sector in value added produced in Indian manufacturing begs the question: how far is it due to the exposure of the industry to world markets? It can be

assumed that the organized sector would play the lion's share in the links to the world market both in terms of exports and imports, and it is this which propels the dominance of this sub-sector in terms of output. We do not have detailed data in the available statistics to quantify the export orientation of the unorganized sector, although it is well known that some lines of activity are export oriented to well developed marketing channels—which themselves might be parts of the national (and international) organized sector. But it is possible to quantify the external exposure of the manufacturing sector as whole from official data sources.

The IP-OP (input-output) matrix used for this calculation are detailed input-output transaction table (commodity x industry) of Indian economy available at 115 sector desegregation for 1998-99 and 130 sector desegregation for 2003-4. It is at factor cost and is prepared by CSO (Central Statistical Organisation) of Government of India for every five years.

Table 8: Classification of industries (IP-OP Matrix) by degree of dominance in Value Added of the organized and unorganized sectors 2003-04, and the export propensities of the different groups

Category	Number of Industries	Industry Code (IP-OP Matrix)	Share of export in total final use	Share of intermediate use to total use
Fully/Mostly ASI	47	38,40-42,47,48,50,54,57,58,61,63-70,72,73,75,77,78,80,82-92,94-100,102-105	38.1	67.9
Major share of ASI	9	45,49,51,52,56,71,76,79,101	2.0	6.0
Equal importance of two sub-sectors	6	43,53,59,60,62,81	10.6	4.8
Major share of Unorganized	6	39,46,55,74,93,44	1.1	3.7
Total			11.7	21.4

Source: Intersectoral Transaction Matrix of Indian Economy (2003-4)
Note: The description of industry codes are given in appendix III.

The sharp difference between the ASI dominated group of industries and the others is revealed in these figures. In particular the results show that the unorganized sector industries cater almost entirely to the demands of the final domestic market. The export markets are almost exclusively served by industries dominated by the ASI sector.

V. Growth of Output and Employment in Different Size-groups

In this section we revert to the aggregative view of all industry and focus on the growth rates over the last two decades in employment and value added in the DME sub-sector and in different size groups of the ASI. The data are presented in Tables 9a and 9b.

Table 9a: Levels and Growth of Employment in DME and Different Segments of Organised Sector

Type & Size	1984-85	1989-90	1994-95	2000-1	2005-6	1984-89	1989-94	1994-00	2000-5
DME	4,535,870	5,656,635	5,478,046	6,457,911	6,928,271	4.52	-0.64	2.78	1.42
10-49	1,066,941	1,302,907	1,374,427	1,458,223	1,652,272	4.08	1.07	0.99	3.17
50-99	685,977	871,086	1,053,705	938,233	952,509	4.89	3.88	-1.92	0.38
100-199	646,159	805,823	970,813	990,654	1,118,200	4.52	3.80	0.34	3.07
200-499	931,494	1,077,572	1,252,666	1,335,894	1,528,308	2.96	3.06	1.08	3.42
500+	3,397,638	2,880,629	3,064,418	3,056,957	3,063,092	-3.25	1.24	-0.04	0.05
Organized	6,728,209	6,938,017	7,716,029	7,779,961	8,314,381	0.62	2.15	0.14	1.67

Note: For the year 2005-6, only DME is for 2005-6 and ASI is for 2004-5.
Source: Unit Level data of NSS and ASI for Several Years.

Table 9b: Levels and Growth of GVA (in Rs. Lakh at 1993-4 constant prices)

Type & Size	1984-85	1989-90	1994-95	2000-01	2005-6	1984-89	1989-94	1994-00	2000-5
DME	706,831	832,038	948,710	1,343,275	2,027,920	3.32	2.66	5.97	8.59
10-49	357,920	573,885	844,204	1,292,681	1,364,656	9.90	8.03	7.36	1.36
50-99	245,161	416,987	782,891	874,484	1,097,600	11.21	13.43	1.86	5.85
100-199	321,542	590,339	865,145	1,306,641	1,660,704	12.92	7.94	7.11	6.18
200-499	640,689	1,053,667	1,746,025	2,257,356	3,042,244	10.46	10.63	4.37	7.75
500+	2,726,616	3,647,309	5,076,791	7,010,434	10,784,208	5.99	6.84	5.53	11.37
Organized	4,291,928	6,282,188	9,315,056	12,741,596	17,949,412	7.92	8.20	5.36	8.94

Note: For the year 2005-6, only DME is for 2005-6 and ASI is for 2004-5.
Source: Unit Level data of NSS and ASI for Several Years.

It is remarkable that the DME sector has picked up the rate of growth of value added in the last two 5-year periods, catching up with the growth rate of the ASI sector. Employment elasticity (ratio of growth of GVA to growth of employment) for the two broad sectors were also quite close together in the last period. This was a distinct change from the earlier years, when in two of the three 5-year periods the employment growth and employment elasticity were both significantly higher in the DME sector.

In fact the adjustment came from both sides—the elasticity of employment increased in the ASI sector, and it fell in the DME sector. This can be seen clearly from Figure 4 which shows the different trajectories of the two components of value added growth—growth in employment and in labour productivity for the two sub-sectors over the last two 5-year periods.

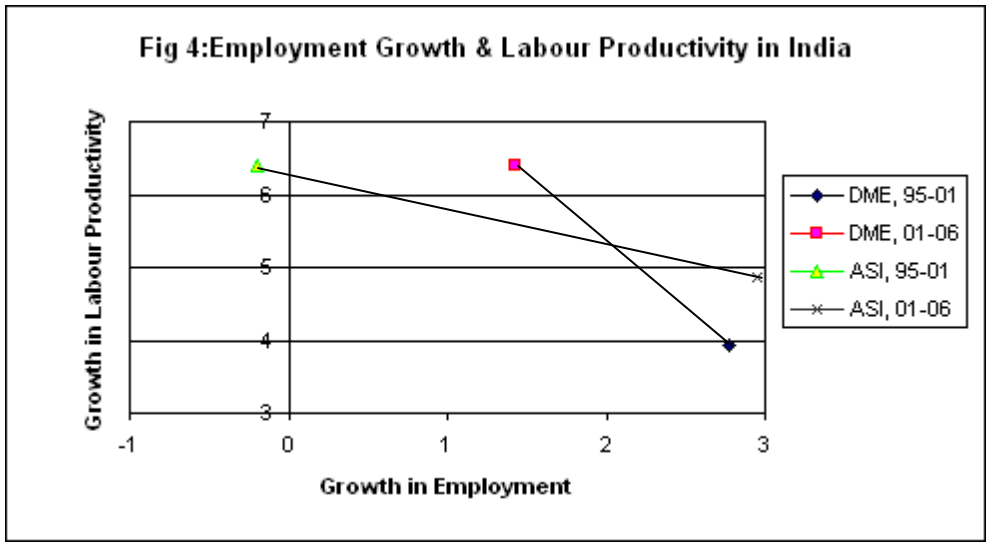
The point suggests that the productivity differential between the DME and the ASI

sectors have fallen in the more recent years, even if had increased over the previous five-year period. This is indeed so as can be seen from the data presented in Table 10.

Table 10: Labour productivity in manufacturing, 1989-90 to 2005-06 (In Rs. and Ratios) at 2004-5 prices

Sector	1989-90	2000-01	2005-06
DME	26,290	37,177	47,701
ASI	163,227	292,720	359,015
500^{+} ASI size	228,132	409,884	585,491
Ratio ASI/DME	6.21	7.87	7.53
Ratio 500^{+}/DME	8.68	11.02	12.27

Source: From unit level data for different years.
Note: For 2005-6 the ASI figures correspond to the year 2004-5. In figure 4, for 2005-6, ASI values are for the year 2005-6 and these are based on printed values and not from unit level data.



PART B

Productivity and Wage differentials by Desegregated Industry

I Labour Productivity by Size Groups

The results reported above for relative labour productivity and wages by firm size categories, refer to all manufacturing. But as we have seen there is considerable separation of industries within manufacturing particularly between the DME and the ASI sectors. How do these differentials by size groups look when we consider them separately for particular industries within manufacturing?

The relative labour productivity by size groups in selected industries in the *privately owned* manufacturing sector is given in Table 11.

Table 11: Private Employee productivity (by GVA) by industry and size groups, 2004-5

Industry	DME	10-49	50-99	100-199	200-499	500+	Total ASI
Food & Beverages	100	264	325	358	555	537	415
Tobacco	100	80	43	87	264	98	106
Textiles	100	335	416	406	491	493	452
Wearing Apparel	100	374	386	277	263	258	281
Chemicals	100	542	804	1,051	1,468	2,357	1,422
Non-Metallic Mineral	100	176	156	619	1,032	1,342	590
Basic Metal	100	99	172	151	396	904	472
Machinery & Equipments n.e.c.	100	170	280	325	384	521	338
Manufacturing	47,701	137,841	189,207	238,479	332,297	479,286	312,519

Source: ASI unit level data of 2004-5.

It seems that there is a big difference between labour-intensive (from food & beverages to wearing apparels) and the capital-intensive ones (from chemicals to machinery & equipments). The over-all labour productivity in the former is at a significantly lower level. Further it is clear that the increase in productivity with firm size is much less steep in theses industries—at least within the ASI sector. Nevertheless, even in the labour-intensive industries, the difference in labour productivity between DME and the smallest ASI firms is quite substantial (except in the small tobacco industry). Secondly, except in garments (number 18) the progression in productivity by firm size class is significant, although of lesser magnitude than in the capital intensive industries.

II Wages by Size Groups

Wage differences by firm size follow the trends in labour productivity (Table 12). Tobacco industry shows a flat profile as with productivity per worker. There is, however, an important difference with the productivity patterns as far as the three capital-intensive industries numbers 26, 27 and 29 are concerned. It is that the profile of wage per worker within the ASI sector does not register its upward slope before the 100-199 size group. In fact in the smaller ASI sub-groups the wage levels are not that different from those in the DME sector

Table 12: Wages of Workers across Size Class of Units in Private Sector, 2004-5

Industry	DME	10-49	50-99	100-199	200-499	500-999	500+	Total
Food & Beverages	100	147	165	180	271	347	30	219
Tobacco	100	35	40	40	54	42	33	35
Textiles	100	134	144	154	175	196	220	184
Wearing Apparel	100	140	145	126	128	126	129	130
Chemicals	100	175	206	210	300	501	531	315
Non-Metallic Mineral	100	99	84	129	249	318	314	162
Basic Metal	100	72	88	93	127	161	206	131
Machinery & Equipments n.e.c.	100	88	102	122	163	191	246	148
Manufacturing	100	123	136	150	196	242	245	186

Source: Same as Table 11.

This odd result might be due to the use of contract workers in the 10-99 size groups of the ASI in theses industries is relatively larger proportions. This is a point which is of interest for the analysis of labour laws as well and is dealt with in another paper. Unfortunately we cannot verify the correctness of this hypothesis because the NSS data for the DME sector do not include information on the use of contract labour. Within the ASI sector the increase in wage per directly employed workers with firm size does not seem to be all that different from what we found for all workers in Table 13.

Table 13 Wages of Directly Employed Workers across Size Class of Units in Private Sector, 2004-5

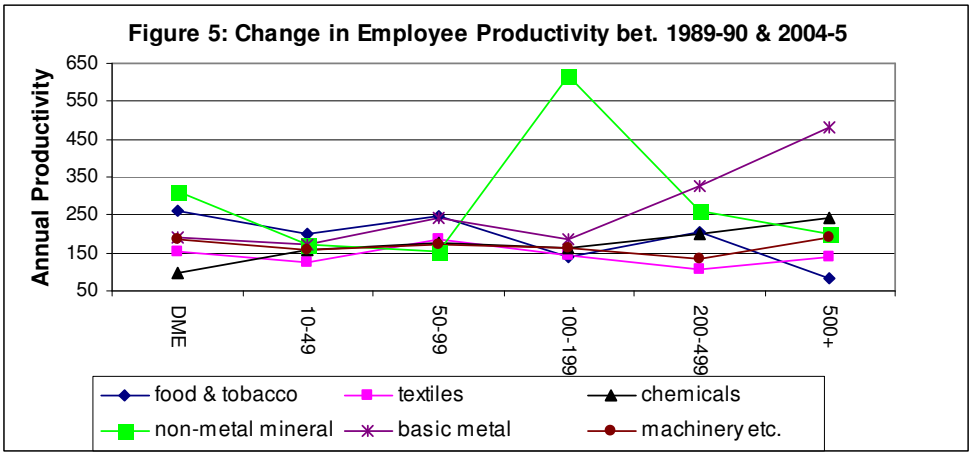
Industry	DME	10-49	50-99	100-199	200-499	500-999	500+	Total
Food & Beverages	100	112	130	135	214	281	183	170
Tobacco	100	144	160	163	246	221	184	185
Textiles	100	121	128	138	160	182	210	169
Wearing Apparel	100	100	99	89	91	88	95	92
Chemicals	100	123	150	154	237	415	543	247
Non-Metallic Mineral	100	115	112	166	330	458	390	213
Basic Metal	100	110	143	157	240	359	457	246
Machinery & Equipments n.e.c.	100	134	156	211	277	366	489	243
Manufacturing	100	124	142	153	206	260	294	198

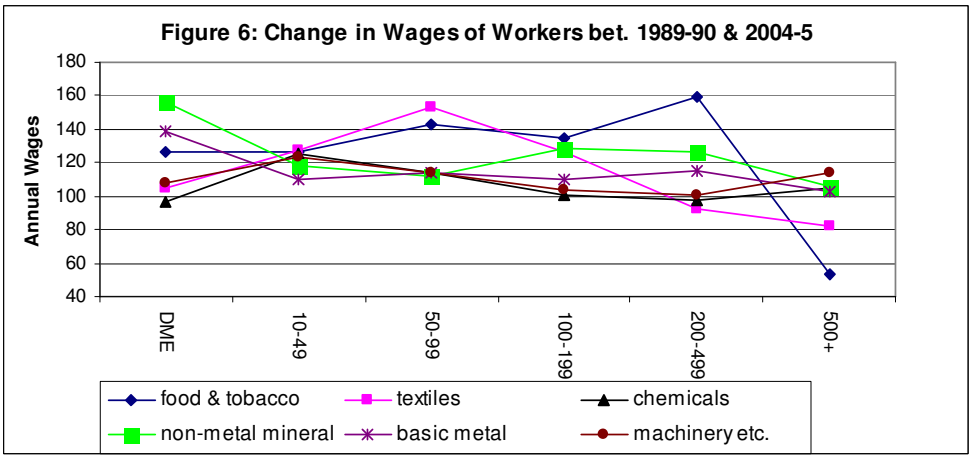
Source: Same as Table 11.

VB Productivity and Wage Increase over time

Figures 5 and 6 portrays the changes in labour productivity and average earnings (of all labour) by size groups for the major industry groups over the last 15-year period for which we have data. The values portrayed have been deflated by the appropriate indices. The indices show a significant upward rend in most cases (only one observation of productivity in DME falling below the index of 100).

An important conclusion suggested by the graphs is that the DME sector seems to have improved its position relative to at least the smaller size groups in the ASI for most industries in terms of labour productivity. This improvement is perhaps not so clear cut in terms of average earnings. Only two of the five industry groups—the newer metals and non-metallic mineral industries show a relative increase of wages in the DME units relative to the smaller ASI enterprises.





PART C

I Inter-State Differences

In this section we select eight major states for the detailed analysis of size structures in manufacturing and their differences between states. These states are Andhra Pradesh (AP), Gujarat (GU), Karnataka (KA), Maharashtra (MA), Punjab (PU), Tamil Nadu (TN), Uttar Pradesh (UP) and West Bengal. Together these major states account for three quarters of total manufacturing employment (Table 14).

Table 14: Share in Manufacturing Employment

Items	DME	ASI	All
Selected 8 industries	67.8	71.1	69.5
Selected 8 states	78.5	73.6	75.9
Selected 8 industries & 8 states	53.5	52.3	52.9

Note: ASI data is for 2003-4 and DME data is for 2005-6. For selected industry group see table 11.

Furthermore, we would concentrate for the detailed industry-level analysis on eight major industries. These industries together cover 70 per cent of all manufacturing employment.

The growth rates of value added and employment elasticises in the two sub-sectors are shown in the following graphs 7 and 8 separately for two periods 1995-2001 and 2001-06. Tamil Nadu (TN), and to a lesser extent Maharashtra (MA) are the only states in which the ASI grew at higher rate (in terms of value added) in both periods. In the earlier period, when the ASI growth rate was generally low, the growth rate in the DME sector was in most states higher than the ASI growth rates. The recovery of growth rates in the ASI sector in the first decade of the century reversed this order, but DME output growth continued to be strong in the states which also showed a higher ASI growth rate. Only Punjab (PU) seems to have been an exception in the recent period with a significant negative growth rate for the DME value added.

Turning to employment elasticity Figures 9 and 10 give the dominant impression of a low value in both periods,. In the earlier period positive employment elasticity in DME ensured that employment in manufacturing as a whole kept growing at a positive if slow rate, in spite of the negative growth in ASI employment in several states, particularly in Uttar Pradesh (UP) and West Bengal (WB). Even if the employment elasticity in ASI recovered in the early

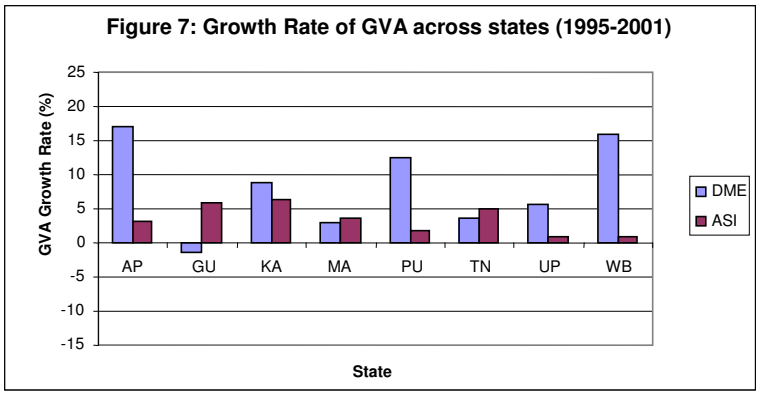


Figure 7: Growth Rate of GVA across states (1995-2001)
GVA Growth Rate (%)
25
20
15
10
5
0
-5
-10
-15
AP
GU
KA
MA
PU
TN
UP
WB
State
DME
ASI

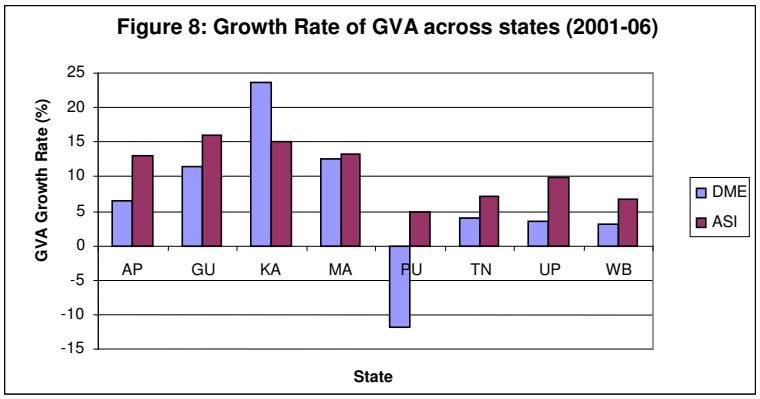


Figure 8: Growth Rate of GVA across states (2001-06)
GVA Growth Rate (%)
25
20
15
10
5
0
-5
-10
-15
AP
GU
KA
MA
PU
TN
UP
WB
State
DME
ASI

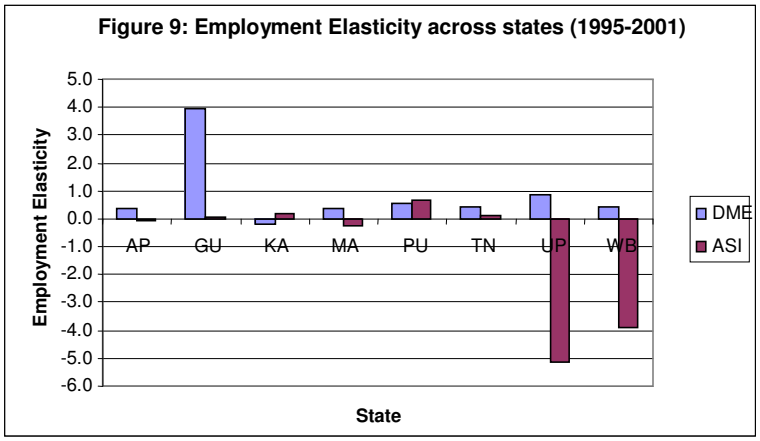
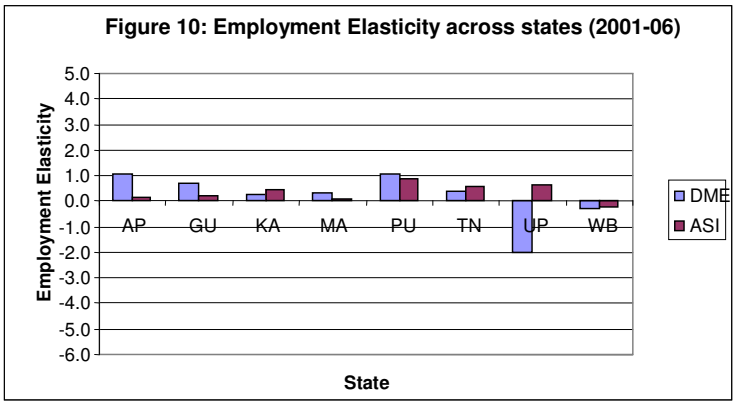


Figure 9: Employment Elasticity across states (1995-2001)
Employment Elasticity
5.0
4.0
3.0
2.0
1.0
0.0
-1.0
-2.0
-3.0
-4.0
-5.0
-6.0
AP
GU
KA
MA
PU
TN
UP
WB
State
DME
ASI



years of this century, it continued to be of a low positive value in six of the eight states, with UP and West Bengal registering large negative values. As in the first period, the DME sector generally helped to sustain employment growth in manufacturing in most of these states.

Size Distribution of Employment by State and Industry

This section gives descriptive account of the size distribution of the eight industries covered in the analysis for the eight states covered as well as All-India. It will be seen that the industries do have substantially different size structures but that within each industry there are significant differences by employment size group as between the states concerned.

The eight industries at the 2-digit level can be classified into three groups.

Group A: Industries which are dominated by the DME units: Food Products; Wearing Apparel: Non-metallic Minerals; and Machinery not elsewhere counted.

Group B: Industries in which large scale units are dominant: Tobacco and Basic Metals.

Group C: Industries in which employment is more evenly spread between DME, smaller ASI and large ASI groups: Textiles and Chemicals.

It has, however, to be noted that there are interesting inter-state differences within each group.

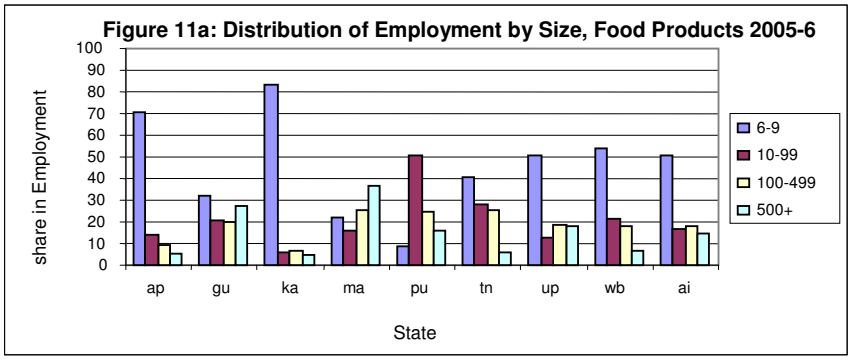


Figure 11a: Distribution of Employment by Size, Food Products 2005-6
share in Employment
100
90
80
70
60
50
40
30
20
10
0
ap
gu
ka
ma
pu
tn
up
wb
ai
State
6-9
10-99
100-499
500+

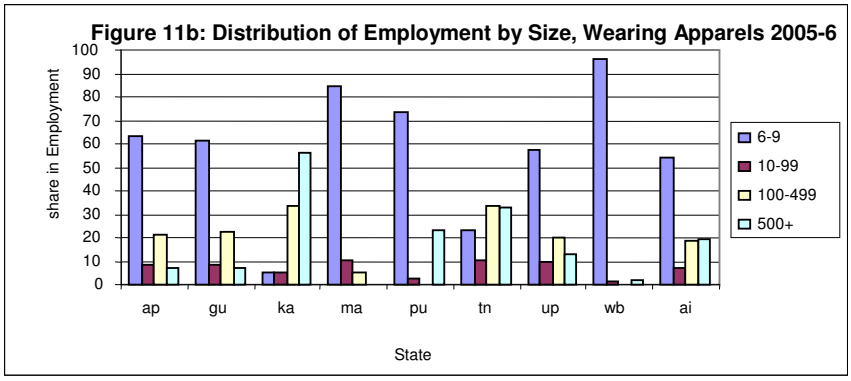


Figure 11b: Distribution of Employment by Size, Wearing Apparels 2005-6
share in Employment
100
90
80
70
60
50
40
30
20
10
0
ap
gu
ka
ma
pu
tn
up
wb
ai
State
6-9
10-99
100-499
500+

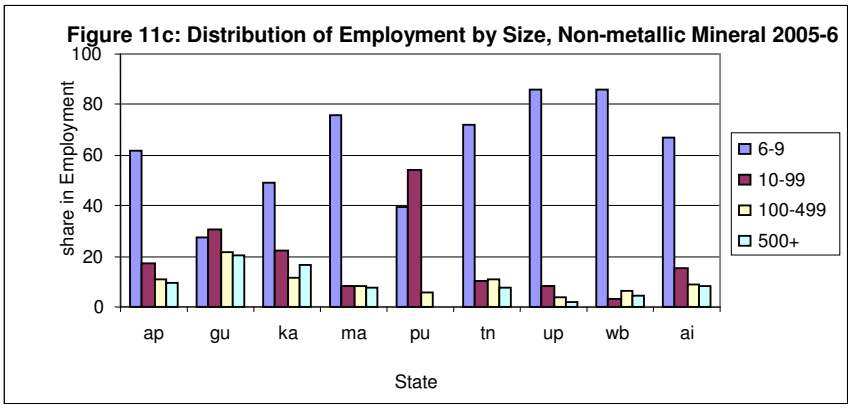


Figure 11c: Distribution of Employment by Size, Non-metallic Mineral 2005-6
share in Employment
100
80
60
40
20
0
ap
gu
ka
ma
pu
tn
up
wb
ai
State
6-9
10-99
100-499
500+

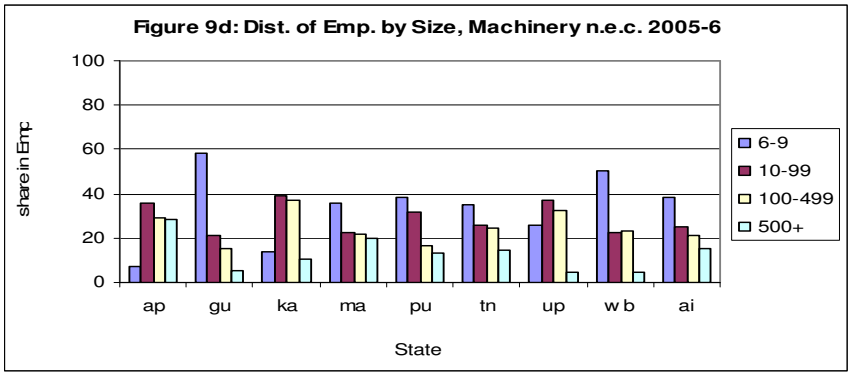


Figure 9d: Dist. of Emp. by Size, Machinery n.e.c. 2005-6
share in Emp
100
80
60
40
20
0
ap
gu
ka
ma
pu
tn
up
w b
ai
State
6-9
10-99
100-499
500+

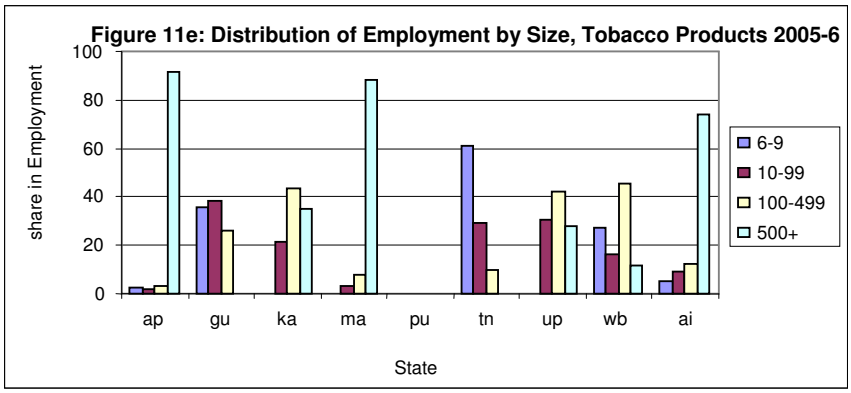


Figure 11e: Distribution of Employment by Size, Tobacco Products 2005-6
share in Employment
100
80
60
40
20
0
ap
gu
ka
ma
pu
tn
up
wb
ai
State
6-9
10-99
100-499
500+

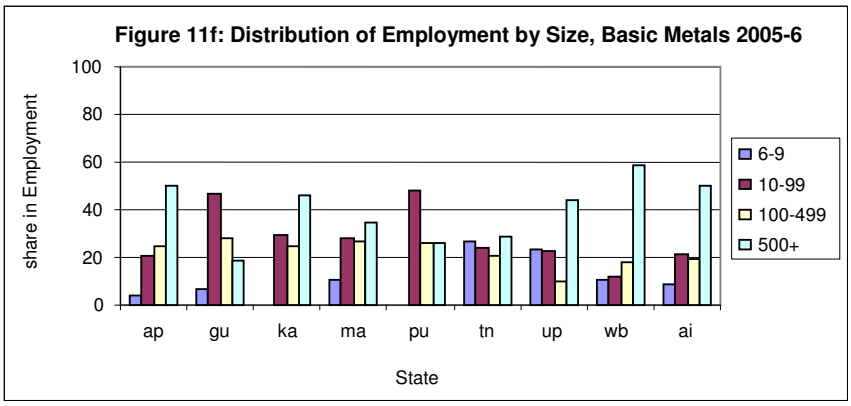


Figure 11f: Distribution of Employment by Size, Basic Metals 2005-6
share in Employment
100
80
60
40
20
0
ap
gu
ka
ma
pu
tn
up
wb
ai
State
6-9
10-99
100-499
500+

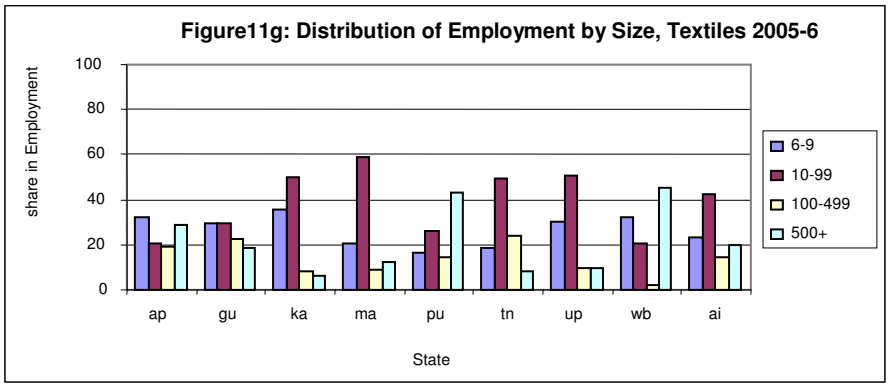


Figure11g: Distribution of Employment by Size, Textiles 2005-6
share in Employment
100
80
60
40
20
0
ap
gu
ka
ma
pu
tn
up
wb
ai
State
6-9
10-99
100-499
500+

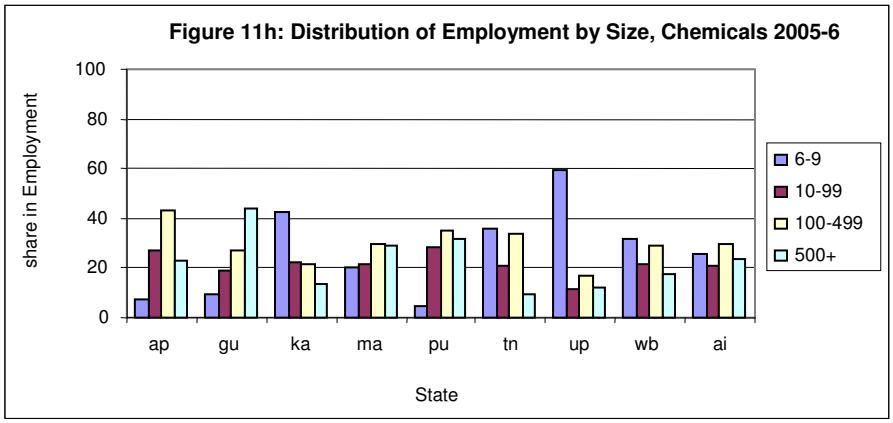


Figure 11h: Distribution of Employment by Size, Chemicals 2005-6
share in Employment
100
80
60
40
20
0
ap
gu
ka
ma
pu
tn
up
wb
ai
State
6-9
10-99
100-499
500+

Group A: In **Food products**, three states, Gujarat (GU), Maharashtra (MA) and Punjab (PU) have substantial presence of the ASI sector (although not too much of very large units). The same is true of **Wearing Apparel** in Karnataka (KA) and Tamil Nadu (TN), but in both these states, and particularly in Karnataka large ASI units have a significant presence. Smaller ASI units are of importance in **non-metallic minerals**. The dominance of DME units in **Machinery n.e.c.** seems to be due the large presence of this type of units in Gujarat (GU) and West Bengal (WB): the ASI has an equal or bigger role in the other states.

Group B: The dominance of large ASI firms **in Tobacco Products** at the All-India level is due to the importance of such firms in two states, Andhra Pradesh (AP) and Maharashtra (MA). In the other states small-medium ASI units, but not DME, have a significant role. In **Basic Metals,** small ASI units in the 10-49 group have a much more important role in Gujarat and Punjab than in other states.

Group C: In **Textiles** West Bengal and Punjab has a large role for large 500+ ASI units, while in most other states small 10-49 units are more important along with DME units. In **Chemicals**, DME units are more important in Uttar Pradesh (UP) and Karnataka (KA) but larger sized ASI units are important in Gujarat (GU).

Inter-state differences in size structure of Manufacturing

Table 15 presents the size structure of manufacturing for all the eight industries taken together **in the eight** states **selected. The size distribution** depends partly on the characteristics of the different industries and partly on **state specific** factors affecting the size distribution of all industries in that state. We control for the variations of industrial composition as between the states by calculating the hypothetical size structure in a state by using the industry-specific size structure of the state but imposing on it the industrial composition of our reference state--West Bengal. This way we can see the quantitative importance of the difference in industrial composition in accounting for the observed inter-state difference in size structure of manufacturing as a whole.

Table 15: Size Distributions in Manufacturing across eight Major States

STATE	DME	ASI Small 10-99	ASI Medium 100-199	Large 200-499	Very Large 500 and over
AP actual	**40.3**	**14.3**	**4.3**	**8.0**	**33.0**
Hypothetical	43.5	16.1	5.5	11.4	23.5
GU actual	**52.8**	**15.3**	**7.2**	**9.2**	**15.6**
Hypothetical	43.0	19.8	9.2	12.2	15.8
KA actual	54.2	12.4	5.1	10.5	17.0
Hypothetical	52.3	15.8	6.8	10.9	14.3
MA actual	50.2	14.5	5.9	9.8	19.5
Hypothetical	57.0	12.5	4.8	8.7	17.1
PU actual	23.2	30.1	6.7	12.9	27.0
Hypothetical	26.8	29.3	6.7	10.1	27.1
TN actual	44.3	19.3	10.2	12.7	13.4
Hypothetical	46.1		9.6	10.1	13.1
UP actual	58.1	12.0	7.1	9.5	13.3
Hypothetical	56.2	13.5	6.9	10.0	13.5
WB	**58.4**	**8.3**	**3.9**	**5.2**	**24.3**

Note: The hypothetical figures are the percentages in this size group on the assumption that this state had the same industrial composition as West Bengal but the industry-specific size distribution was as found in the state concerned.

WB (West Bengal) was chosen as the reference state because the size structure of manufacturing in this state is the clearest example of the 'missing middle'. Employment is concentrated in the small-scale DME sector and in the very large, with the medium and large sectors accounting for less than 10 per cent of the total. All the other states have a smaller proportion in the DME sector, which is compensated by a larger contribution to employment by small firms in the ASI sector.

A lesser proportion of employment than WB in DME units is particularly conspicuous in three of the eight states—AP (Andhra Pradesh), PU (Punjab) and TN (Tamil Nadu). It will be seen that only a very small part of the difference on this point with West Bengal could be accounted for by the difference in industrial composition. Evidently there are important state-specific differences reducing the share of DME employment in these states.

Only UP (Uttar Pradesh) and MA (Maharashtra) come near to the size structure of WB manufacturing. But the difference of WB with both theses two states is that in the latter the upper mode of the distribution in the Very Large (500+) group is a much lower value. The upper mode is significantly higher in AP, but it is seen that a large part of the difference with West Bengal on this point is due to the industrial composition in AP favouring large ASI units.

GU (Gujarat) is an interesting case where the DME share of employment is quite high – only 5.3 percentage points smaller than WB. But more detailed examination shows (not presented here) that this high percentage is due to a markedly large proportion of employment being in larger DME units of 10+ workers. Furthermore the hypothetical distribution shows that if GU had the same industrial composition as WB its share of DME employment would have been much less, More than any other state the relatively high share of DME employment in GU is due to its peculiar industrial composition favouring the larger of the DME units.

Another interesting point to observe is that in 4 of the 8 states—GU, KA, MA and UP the size distribution within the ASI sub-sector is much more even than in West Bengal. The upper mode of 500+ units is much less prominent. In fact, other than Andhra Pradesh (AP) already mentioned only Punjab shows a marked U-shaped distribution with relatively large shares of employment at the two ends of the size distribution.

The following tentative hypotheses can be offered as explanations of these inter-state differences. Further research is needed to substantiate the suggestions made here.

- It is hard to deny the hypothesis that the large percentage of DME employment in the base state WB is related to the difficult labour relations in the state which eroded the viability of larger ASI establishments over a long period of time. (Cf. Chakravarty 2010).
- MA and UP are the two states in which the DME share is **also** very high, although smaller than in WB. But the reasons for this high share are different in the two statues. UP is in large part a less developed state in which factory industry is not widespread and less mechanized units predominate. MA, however, is historically a leading industrial state containing the city and environs of India's commercial capital Mumbai. But it has had a past history of industrial disputes which had induced many larger factories to shut down and the production shifted to smaller units to escape the power of industrial unions. The textile industry is the classic case of this kind of transformation (Mazumdar 1984). Although there has been marked reduction of hostile union power and also significant slackening in the operation of labour laws affecting ASI units (particularly relating to the use of non-permanent workers (World Bank 2010) , 'the bundle of factors included in 'hysterisis' have maintained the importance of non-ASI units (Mazumdar and Sarkar 2009; Mazumdar 2010).
- GU is another state which has a large proportion of DME employment. GU along with MA had a history of labor militancy, but it has equally made efforts in recent years to amend

labour laws in a 'pro-employer way' and is generally thought to have a much better climate of labour-management relations (Streefkerk 2001) But as we have already mentioned the size distribution within the DME units tend to be biased towards the larger, and this tilt seems to be driven by industry-specific factors. The newer industries in Gujarat which have been in the forefront of manufacturing in Gujarat have indeed been of a type to favour such units (the prime example being 'gems and Jewellery').

- Andhra Pradesh and Punjab are the two states in which a smaller percentage of employment in the DME sector has gone hand in hand with a substantially larger share of very large (500+) units. Labour regulations are known to be implemented much more liberally in these states and the union power has hardly been disruptive. Evidently of all the states of India newly developing modesties have been free to expand with less impediments in the ASI sub-sector.
- Punjab is unique in having a large proportion of employment in the small 10-99 group of the ASI sector. Admittedly, there is a suggestion of the 'missing middle' within the ASI but this is probably less of an issue for healthy manufacturing growth than in the cases in which the lower mode of the distribution is in the DME sector. Tewari (1998) drew attention to the case of Ludhiana district of Punjab in which "unlike the more sophisticated states of Maharashtra and Gujarat, Ludhiana's industrial is dominated by small and medium-sized firms even in sectors which tend to be characterised by large and hierarchical firms in other regions" (p.1387). She discussed at length the origins of Punjab's entrepreneurship and market for skilled labour which made this type of development possible. In fact the data of Table 15 suggests that this growth of small entrepreneurs co-exits with that of very large enterprises

PART D

I Concentration of Manufacturing in Selected Regions

While analysis at the state level has produced some interesting points about the regional differences in the size structure of manufacturing, more can be gained by looking at a more detailed level of spatial dispersion. One alternative is to use NSS regions for our analysis. This approach reveals a striking picture of concentration of employment in manufacturing in a few selected regions—and further the concentration is virtually the same of the DME and the ASI sub-sectors. Although the industries involved are different, eight common NSS regions (out of 72 NSS regions of India) have around 45 per cent of total manufacturing employment in each of the two sub-sectors. This is shown in Table 16 which specifies the regions.[1]

Table 16: Eight common NSS regions where both ASI and DME have substantial presence

Sl No.	State	NSS Region	Share in Employment within	
			DME	ASI
1	UP	Western	6.0	4.9
2	WB	Central Plain	7.1	5.5
3	GU	Eastern	3.7	4.7
4	MA	Coastal	11.8	6.0
5	AP	Inland Northern	4.3	7.1
6	KA	Inland Southern	3.1	4.8
7	TN	Coastal Northern	4.2	5.1
8	TN	Inland	4.8	5.0
Share of 8 Regions in All India			*45.1*	*43.1*

Note: ASI and DME values are for 2004-5 and 2005-6 respectively**.**

[1] There are a few exceptions to the broad generalization that the same NSS regions are home to the bulk of manufacturing in both the DME and the ASI sectors. The following tables specify the few regions which employ a significant part of manufacturing in each of the sub-sectors without a commensurate share of manufacturing employment in the other sub-sector. This type of employment together accounts for 11-14 per cent of total manufacturing employment in each sub-sector. The industries in which the overlap between DME and ASI employment is not strong are also specified in the tables.

Table 17: Non-Overlapping NSS Regions where either ASI or DME has Substantial Presence

Regions where DME has substantial presence not common with ASI

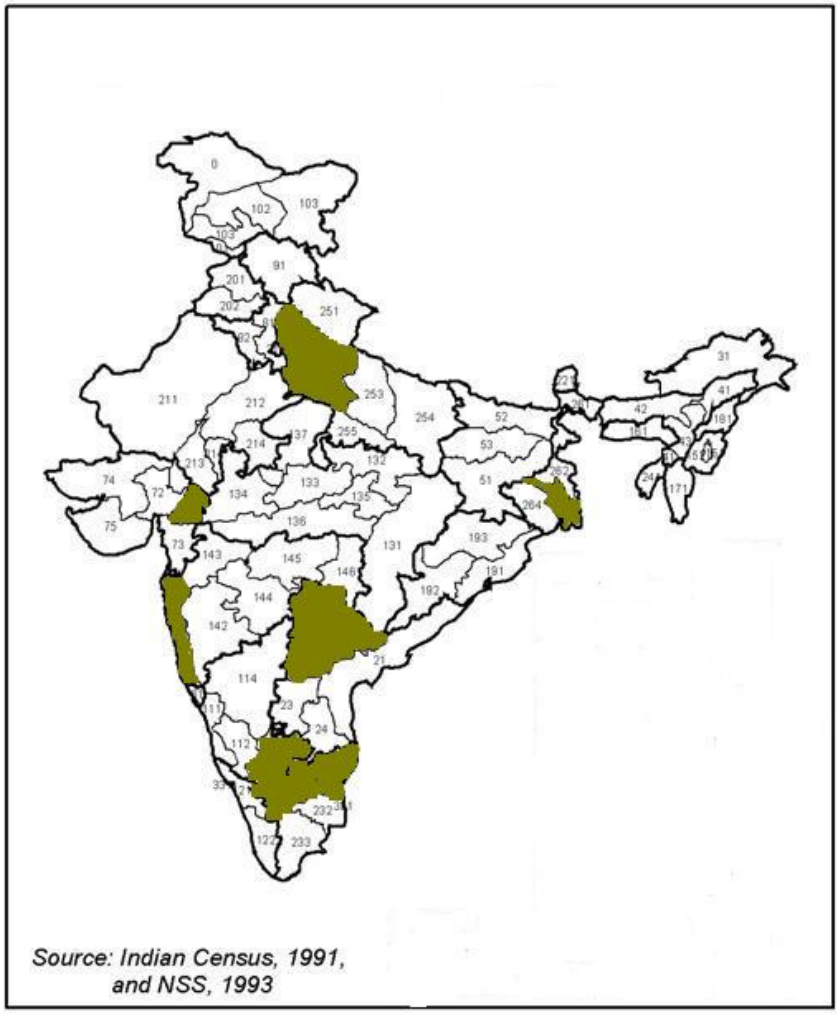
sl. No.	State	Name of NSS region	*Share in Employment within*	
			DME	ASI
1	UP	Eastern	3.2	
2	GU	Saurastra	5.0	
3	KA	Inland Eastern	3.1	

Regions where ASI has substantial presence not common with DME

4	GU	Plains Northern		3.0
5	MA	Inland Western		4.7
6	PU	Northern		3.1
7	TN	Coastal Northern		2.9
Total			*11.3*	*13.7*

The Figure 10 shows 8 regions of concentration in a Map of India.

Figure 10: Manufacturing concentration of 8 NSS regions



Note: Two shaded regions of South-Eastern India contain two NSS regions each.

We conclude that locational advantages for manufacturing as a whole—rather than for specific industries--- are similar in strength for DME and ASI establishments. This is, however, not to say that these particularly "industrial" NSS regions have all have a particularly high concentration of non-agricultural employment in manufacturing. Table 18 shows that only one NSS region (Gujarat) have a high 'density' (more than 70 per cent of all non-agricultural employment) in manufacturing. In all the other regions the 'density' ranges from 12 to 20 per cent, even though all of them account for a significantly higher than the All-India proportion of total manufacturing employment, taken DME and ASI sub-sectors together.

Table 13: Share of Manufacturing in Non-farm employment in eight NSS regions

sl. No.	State	Name of NSS region	Share of Manu in NF (%)
1	UP	Western	20.43
2	WB	Central Plain	17.43
3	GU	Eastern	73.95
4	MA	Coastal	17.56
5	AP	Inland Northern	16.50
6	KA	Inland Southern	15.90
7	TN	Coastal Northern	12.46
8	TN	Inland	15.25
9	AI	All India	9.64

Note: we have taken 55th round (1999-2000) NSS figures
NF is defined as rural non-farm + urban UPS workers

II Subcontracting

In the manufacturing sector, two types of product outsourcing or contract manufacturing can be observed. First, the vertical inter-firm linkages, i.e., larger firms outsourcing specific tasks to smaller sized firms in formal and informal sector. It is difficult to measure the extent of this type of subcontracting from firm level balance sheets. Another type of subcontracting is horizontal subcontracting. Ramaswamy (2006) has expressed it as the ratio of goods sold in the same condition as purchased to the total value of product and by-products. On the basis of the Annual Survey of Industries (ASI) data of 2000-01 he observed that horizontal subcontracting has substantial presence in export-oriented industries like wearing apparel and footwear. Across employment size class of industries he found the highest outsourcing intensities in the size class of 10-99 employees and concluded that outsourcing by large firms to smaller firms in the formal sector would not form a significant proportion of latter's output. However, this analysis was

undertaken at all India level. The prevalence of outsourcing practices needs to be examined in a limited geographical area, say at NSS region level (collection of some contiguous districts within a state). This would be covered in our further research in this area.

CONCLUSIONS

1. Part A of this paper investigates the size structure of manufacturing in India, taking all industries together. The importance of the DME sector in the problem of dualism in manufacturing is stressed. But we find that a substantial part of the DME sector is not confined to the legal limit of units employing 6-9 workers. While this needs a revision of the problem of dualism as given in earlier papers, the fact that the legal limit of the employment size of DMEs is not adhered to its detail which does not change the nature of the problem in a qualitative sense. The larger DME units (in excess of the legal limit) are largely confined to three labour intensive industries, and do not differ significantly for smaller units of this sub-sector, in terms of labour productivity (and hence technology).
2. We investigate in section IV of Part A, the industrial composition of the DME and the ASI sub-sectors within manufacturing. The research demonstrates the importance of product market segmentation as between the two sub-sectors: the overlap of industries at the detailed 5-digit level shows that overlapping industries amount to rather less than half of total employment in manufacturing. Even this gives only a lower limit to the extent of segmentation, because DME units can be expected to produce lower quality brands within the 5-digit classification which is not recorded in the statistics.
3. Because of the large productivity difference between the DME and the ASI sectors, the dominance of the ASI sub-sector is much more striking in terms of value added. It is seen in Table 8 that most industries are exclusively produced in the ASI sector in terms of output, although the contribution of DME in terms of total employment is as we have seen substantial.
4. The sharp difference between the ASI dominated group of industries and the others is revealed when we consider the markets for the goods produced by industries dominated by the ASI and the DM sub-sectors separately. In particular the results in Table 8 show that the unorganized sector industries cater almost entirely to the demands of the domestic market. The export markets are almost exclusively served by industries dominated by the ASI sector

5. It is remarkable that the DME sector has picked up the rate of growth of value added in the last two 5-year periods, catching up with the growth rate of the ASI sector. Employment elasticity for the two broad sectors was also quite close together in the last period. This was a distinct change from the earlier years, when in two of the three 5-yaer periods the employment growth and employment elasticity were both significantly higher in the DME sector. Accordingly, while the differential in labour productivity between the DME and the ASI sectors—which had been widening in the earlier years—narrowed in the first five years of this century.
6. Part C of the study looks at inter-state differences in size distribution. We selected eight major 2-digit industries and consider their size distribution for eight major states. Together these selected industries account for 70 per cent of all manufacturing employment. The industries selected differ in terms of their individual size distribution—ranging from, at the All-India level, dominance of the DME sector in Food, Wearing Apparel and Non-metallic Mineral; to dominance of large ASI units in Tobacco and Basic Metals; and to a more spread out distribution among different size groups in Machinery, Textiles and Chemicals. There are, however, significant differences in the size structure within individual industries as between the eight states.
7. Looking at all the eight industries together, West Bengal is identified as the state with the strongest incidence of the missing middle, with a very large presence of employment in the DME units and a substantial percentage in the largest ASI units. This striking bi-modal distribution can be traced to historical factors originating in militant trade unionism tolerated by the left leaning states administration. It affected industrial relations in the traditional ASI sector which induced a major disinvestment and migration of industry to other states. We **compare the** size distribution of manufacturing in other states with West Bengal as of the year 2004-05. Since the size distribution is affected by the specific industrial composition of a particular state, we provide the hypothetical size distribution in each state using the industry weights of the reference state-West Bengal and use West Bengal as the reference. Maharashtra is another state which has been affected historically by unsettled industrial relations, although there have been major attempts at labour reform in recent years. It shows the effect of these historical factors in having a larger than average share of DME employment, although somewhat less than

WB. The high percentage of employment in the DME sector in UP is more due to the limited development of modern industry in the state than to deindustrialization in response to labour problems.

8. Punjab, Tamil Nadu and Andhra Pradesh are the states which have markedly smaller proportion of manufacturing employment in the DME sector. They also have a more even distribution of employment than West Bengal in the very large ASI group—specially in the case of Andhra Pradesh if we allow for the difference in industrial comparison between this state and West Bengal. These three states are examples of size distribution which results form a more responsive entrepreneurial development in the recent history of industrial growth in India.

9. The last Part of this paper addresses two special issues which have been critical in the development of mid-size manufacturing firms in the history of industrialization in East Asian countries. As discussed in Mazumdar and Sarkar (2009) the East Asian pattern contrasts strongly with the Indian experience of the "missing middle". Section I of Part D brings out the important point that India has suffered from marked spatial concentration of manufacturing employment – both in the ASI and the DME sectors. In section II of Part D we note that Indian manufacturing has experienced a much more limited role of subcontracting – a phenomenon which has helped the more dispersed industrialization across size groups in East Asia.

Appendix I

Percentage Distribution of Employment in Establishments classified by total number of workers and the number of hired workers.

Industry code	Full time worker	Part time worker	All worker	Hired worker	Working owners	Other workers	Share of part time worker	Share of hired worker
01	5,040	236	5,276	4,275	648	353	4.5	81.0
15	1,167,381	150,169	1,317,549	992,840	197,569	127,141	11.4	75.4
16	24,790	962	25,752	21,260	2,892	1,600	3.7	82.6
17	1,388,762	98,716	1,487,478	1,151,666	193,046	142,766	6.6	77.4
18	426,235	26,779	453,014	364,402	63,410	25,202	5.9	80.4
19	166,718	10,054	176,772	138,616	21,849	16,307	5.7	78.4
20	142,480	10,558	153,038	119,406	24,547	9,085	6.9	78.0
21	56,970	2,089	59,058	45,339	8,108	5,611	3.5	76.8
22	163,573	5,295	168,868	136,269	26,832	5,767	3.1	80.7
23	6,591	1,218	7,809	5,572	1,028	1,209	15.6	71.4
24	246,059	10,211	256,270	193,779	34,277	28,214	4.0	75.6
25	119,282	6,030	125,312	97,304	20,821	7,188	4.8	77.6
26	831,381	55,288	886,670	754,889	73,807	57,973	6.2	85.1
27	50,856	876	51,731	42,259	7,540	1,932	1.7	81.7
28	414,476	12,203	426,679	342,490	59,832	24,357	2.9	80.3
29	245,617	2,636	248,253	212,447	29,603	6,203	1.1	85.6
30	8,534	94	8,628	8,377	158	94	1.1	97.1
31	68,124	1,968	70,092	55,327	10,649	4,116	2.8	78.9
32	16,578	562	17,140	13,965	2,595	581	3.3	81.5
33	10,872	279	11,151	9,215	1,803	133	2.5	82.6
34	65,453	571	66,025	54,445	8,094	3,486	0.9	82.5
35	73,096	1,319	74,415	56,948	9,952	7,516	1.8	76.5
36	846,983	24,175	871,158	759,460	87,361	24,337	2.8	87.2
37	7,950	6	7,955	7,026	926	3	0.1	88.3
Manufacturing	6,553,801	422,294	6,976,093	5,587,576	887,347	501,174	6.1	80.1

Source: Unit Level data of 62nd round of NSSO.

Note: For description of industry code, see below.

Description of industry code:

01 - Cotton ginning, cleaning and baling; 15 –Food products & beverages; 16 –Tobacco products; 17 – Textiles; 18 - Wearing apparel; 19 – Leather & leather products; 20 – Wood & wood products; 21 – Paper & paper products; 22 – Publishing & printing; 23 – Coke & petroleum products; 24 – Chemical & chemical products; 25 – Rubber & plastic products; 26 – Other non-metallic mineral products; 27 – Basic metals; 28 – Fabricated metal products; 29 – Machinery & equipment n.e.c.; 30 – Office, accounting & computing machinery; 31 – Electrical machinery & apparatus; 32 – Radio, television & communication equipments; 33 – medical, optical instruments, clocks & watches; 34 – Motor vehicles, trailers etc.; 35 – Other transport equipments; 36 – Furniture & fixtures; 37 – Recycling;

Appendix II

Total persons engaged in Manufacturing

	DME			ASI			Manufacturing			Manufacturing		DME		ASI	
State	1994-5	2000-1	2005-6	1994-5	2000-1	2005-6	1994-5	2000-1	2005-6	gr95-01	gr01-06	gr95-01	gr01-06	gr95-01	gr01-06
AP	269,942	398,194	555,595	911,576	900,677	972,634	1,181,518	1,298,871	1,528,229	1.59	3.31	6.69	6.89	-0.20	1.55
GU	726,355	528,318	777,346	727,784	744,753	887,511	1,454,139	1,273,071	1,664,857	-2.19	5.51	-5.17	8.03	0.38	3.57
KA	498,572	456,229	600,954	433,252	465,521	641,864	931,824	921,750	1,242,818	-0.18	6.16	-1.47	5.67	1.20	6.64
MA	818,684	876,799	1,080,170	1,220,158	1,158,935	1,245,096	2,038,842	2,035,734	2,325,266	-0.03	2.70	1.15	4.26	-0.85	1.44
PU	126,634	191,116	96,807	332,099	357,774	439,246	458,733	548,890	536,053	3.04	-0.47	7.10	-12.72	1.25	4.19
TN	756,495	824,820	893,121	1,084,292	1,118,161	1,355,789	1,840,787	1,942,981	2,248,910	0.90	2.97	1.45	1.60	0.51	3.93
UP	810,563	1,079,866	746,714	673,682	524,431	719,546	1,484,245	1,604,297	1,466,260	1.30	-1.78	4.90	-7.11	-4.09	6.53
WB	474,948	719,286	690,457	675,077	556,513	516,107	1,150,025	1,275,799	1,206,564	1.74	-1.11	7.16	-0.81	-3.17	-1.50
AI	5,478,045	6,454,119	6,928,271	7,973,259	7,879,409	9,111,680	13,451,304	14,333,528	16,039,951	1.06	2.28	2.77	1.43	-0.20	2.95

Gross Value Added (in Rs. Lakh at constant 93-94 prices)

	DME			ASI			Manufacturing			Manufacturing		DME		ASI	
State	1994-5	2000-1	2005-6	1994-5	2000-1	2005-6	1994-5	2000-1	2005-6	gr95-01	gr01-06	gr95-01	gr01-06	gr95-01	gr01-06
AP	23,313	59,968	82,229	639,883	772,450	1,428,813	663,196	832,418	1,511,042	3.86	12.66	17.05	6.52	3.19	13.09
GU	139,096	128,578	221,947	1,141,606	1,611,215	3,373,591	1,280,702	1,739,793	3,595,538	5.24	15.63	-1.30	11.54	5.91	15.93
KA	37,739	62,916	181,388	491,335	709,124	1,428,813	529,074	772,040	1,610,202	6.50	15.84	8.89	23.59	6.31	15.04
MA	202,303	242,025	436,020	2,113,227	2,634,296	4,915,911	2,315,531	2,876,320	5,351,931	3.68	13.22	3.03	12.49	3.74	13.29
PU	29,605	59,824	32,052	329,927	367,695	464,637	359,532	427,520	496,688	2.93	3.04	12.44	-11.73	1.82	4.79
TN	142,178	175,521	213,460	1,051,498	1,402,539	1,975,591	1,193,676	1,578,061	2,189,051	4.76	6.76	3.57	3.99	4.92	7.09
UP	115,912	160,615	190,914	820,930	861,095	1,381,346	936,842	1,021,710	1,572,260	1.46	9.00	5.59	3.52	0.80	9.91
WB	58,715	142,875	166,804	469,995	493,432	685,558	528,709	636,307	852,361	3.14	6.02	15.98	3.15	0.81	6.80
AI	932,925	1,385,676	2,027,920	9,434,835	12,390,970	21,327,313	10,367,760	13,776,646	23,355,233	4.85	11.13	6.82	7.91	4.65	11.47

Labour Productivity (in Rs.) at constant 93-94 prices

	DME			ASI			Manufacturing			Manufacturing		DME		ASI	
State	1994-5	2000-1	2005-6	1994-5	2000-1	2005-6	1994-5	2000-1	2005-6	gr95-01	gr01-06	gr95-01	gr01-06	gr95-01	gr01-06
AP	8,636	15,060	14,800	70,195	85,763	146,901	56,131	64,088	98,875	2.23	9.06	9.71	-0.35	3.39	11.36
GU	19,150	24,337	28,552	156,861	216,342	380,118	88,073	136,661	215,967	7.60	9.58	4.08	3.25	5.50	11.93
KA	7,569	13,790	30,183	113,406	152,329	222,604	56,778	83,758	129,561	6.69	9.12	10.51	16.96	5.04	7.88
MA	24,711	27,603	40,366	173,193	227,303	394,822	113,571	141,292	230,164	3.71	10.25	1.86	7.90	4.64	11.68
PU	23,378	31,303	33,109	99,346	102,773	105,781	78,375	77,888	92,657	-0.10	3.53	4.99	1.13	0.57	0.58
TN	18,794	21,280	23,900	96,976	125,433	145,715	64,846	81,219	97,338	3.82	3.69	2.09	2.35	4.38	3.04
UP	14,300	14,874	25,567	121,857	164,196	191,975	63,119	63,686	107,229	0.15	10.98	0.66	11.44	5.10	3.18
WB	12,362	19,863	24,158	69,621	88,665	132,833	45,974	49,875	70,644	1.37	7.21	8.22	3.99	4.11	8.42
AI	17,030	21,470	29,270	118,331	157,258	234,066	77,076	96,115	145,607	3.75	8.66	3.94	6.39	4.85	8.28

Employment Elasticity of Manufacturing Sector

	Manufacturing	Manufacturing	DME	DME	ASI	ASI
State	elas_9501	elas_0105	elas_9501	elas_0105	elas_9501	elas_0105
AP	0.41	0.26	0.39	1.06	-0.06	0.12
GU	-0.42	0.35	3.97	0.70	0.07	0.22
KA	-0.03	0.39	-0.17	0.24	0.19	0.44
MA	-0.01	0.20	0.38	0.34	-0.23	0.11
PU	1.04	-0.16	0.57	1.08	0.69	0.87
TN	0.19	0.44	0.41	0.40	0.10	0.55
UP	0.90	-0.20	0.88	-2.02	-5.11	0.66
WB	0.56	-0.18	0.45	-0.26	-3.89	-0.22
AI	0.22	0.20	0.41	0.18	-0.04	0.26

Appendix III

Sector code	Commodity/Industry(03-04)
38	Sugar
39	Khandsari, boora
40	Hydrogenated oil (vanaspati)
41	Edible oils other than vanaspati
42	Tea and coffee processing
43	miscellaneous food products
44	Beverages
45	Tobacco products
46	Khadi ,cotton, textiles (handlooms)
47	Cotton Textiles
48	Woollen textiles
49	Silk textiles
50	Art silk, synthetic fibre textiles
51	Jute hemp, mesta textiles
52	Carpet weaving
53	Readymade garments
54	Miscellaneous textile products
55	Furniture and fixtures-wooden
56	Wood and Wood products
57	Paper ,Paper pdt and newsprint
58	printing and publishing
59	leather footwear
60	Leather and leather pdts
61	Rubber products
62	plastic products
63	petroleum products
64	coal tar pdts

Sector code	Commodity/Industry(03-04)
65	Inorganic heavy chemicals
66	Organic heavy chemicals
67	Fertilizers
68	pesticides
69	Paints, Varnishes and lacquers
70	Drugs and medicines
71	Soaps, cosmetics & glycerine
72	Synthetic fibbers ,resin
73	Other chemicals
74	structural clay products
75	Cement
76	Other non metallic mineral products
77	Iron ,steel and ferrous alloys
78	Iron and steel casting & forging
79	Iron and steel foundries
80	Non -ferrous metals
81	Hand tools ,hardware
82	Miscellaneous metal product
83	Tractors and agri implements
84	Industrial machinery(F & T)
85	Industrial machinery(other)
86	Machine tools
87	Other non -electrical machinery
88	Electrical Industrial Machinery
89	Electrical wires & cables
90	Batteries
91	Electrical appliances

Sector code	Commodity/Industry(03-04)
92	Communication equipments
93	Other electrical machinery
94	Electronic equipment(incl TV)
95	Ship and boats
96	Rail equipments
97	Motor vehicles
98	Motor cycles and scooters
99	Bicycles ,cycle-rickshaw
100	Other transport equipments
101	Watches and clocks
102	Medical ,precision & optical instruments
103	Gems & jewellery
104	Aircraft & spacecraft
105	Miscellaneous manufacturing

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