

## CHAPTER 8

INTER-INDUSTRIAL LINKAGES IN ORGANIZED AND UNORGANIZED  
SECTORS OF UP'S ECONOMY : A COMPARATIVE ANALYSIS

## 8.1 INTRODUCTION

In the preceding chapters, we have examined the inter-industrial relationships for the U.P.'s economy. For this purpose, the magnitudes of interindustrial linkages and structural multipliers have been estimated and discussed in detail. The various effects of some income redistribution policies in the economy have also been examined. The empirical analysis presented in the chapters gave a clear picture of the structure of the state economy in the input-output framework.

The total economy, particularly its industrial sectors, can be divided in two categories namely, organized and unorganized sectors. In the Indian context, an organized sector constitutes the factories employing 10 workers with power or 20 or more workers without power. The industrial units which are employing less than 10 workers, with power or less than 20 workers without power fall in the category of unorganized sector (State Planning Institute, 1975). The role of unorganized sector, as a whole, is quite important in the state economy which is basically a rural and agriculture oriented. The unorganized industrial sectors constituted 50.4 percent of total states

industrial output and 52.1 percent of total income of the state economy, in the year 1970-71 (see Table 8.1). This reflects a vital role of unorganized sector in the state economy. Keeping this view in mind, it would be interesting to make a comparative analysis of the interindustrial linkages in the organized and unorganized sectors of the state economy. The present chapter is devoted to this aspect. Specifically, the production structures reflecting output, income and employment generation potentials and interindustrial linkages of both the types of sectors would be studied in this chapter. This analysis would be helpful to understand the industrial structure of the state economy in a much more meaningful way. It is an accepted fact that unorganized sector of the state, will continue to exist. Neglecting this sector for growth would worsened the growth of the economy. The only alternative we see, before the state is to develop the unorganized sector of it's economy further. In this context this study would highlight the growth potentials of the unorganized and organized sectors of the state economy in a comparative framework.

## 8.2 DATA BASE AND METHODOLOGY FOR STUDY

The input-output table which is the basis of this analysis has already been mentioned and discussed earlier in Chapter 2. The State Planning Institute has developed a separate input-output table for the unorganized sector of the state economy<sup>1</sup>.

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<sup>1</sup>. State Planning Institute (1975, Appendix 6).

The I-O table for the total economy and the table for the unorganized sector were used for the analysis presented in this chapter. For the comparative analysis we require the I-O table for the organized sector of the economy, as this was not given separately by the State Planning Institute. The method used by us for derivation of such table was as follows :

The I-O table for total economy and the table for the unorganized sector were used to derive the I-O table for the organized sector. The I-O table for the economy as a whole incorporates the interindustry flows between the sectors combining both organized and unorganized elements together<sup>1</sup>. This implies that for any sector

$$X_{ij} = X_{ij}^{OS} + X_{ij}^{UOS} \quad (8.1)$$

$$(i = 1, \dots, n, j = 1, \dots, n)$$

The output of the  $i$ th sector consumed by the  $j$ th sector ( $X_{ij}$ ), is composed of the sum of output of  $i$ th sector from the organized sector ( $X_{ij}^{OS}$ ) and the output of the  $i$ th sector from the unorganized sectors ( $X_{ij}^{UOS}$ ) to the  $j$ th sector.  $X_{ij}$  and  $X_{ij}^{UOS}$  are known from the I-O tables. Given these flows,  $X_{ij}^{OS}$ , i.e., the flows from the organized sectors only, can be estimated by taking their difference

$$X_{ij}^{OS} = X_{ij} - X_{ij}^{UOS} \quad (8.2)$$

$$(i = 1, \dots, n, j = 1, \dots, n)$$

In this way we got all the elements of the I-O flow matrix for the organized sector of the economy.

The I-O operations discussed in detail in Chapter 5 have been carried out separately over these two I-O matrices, i.e., for the organized and unorganized segments of the state economy. Various linkages, as we have derived for the total economy in Chapter 5, have also been derived for the two groups of the sectors separately<sup>1</sup>. The results of the analysis are given in the following section.

### 8.3 DISCUSSION OF THE EMPIRICAL RESULTS

The first part of the study, was concerned with the analysis of output structure, and value added shares of organized and unorganized industrial sectors in the economy. In this connection, Table 8.1 gives the absolute and percentage contributions of major organized and unorganized industrial sectors to the gross output and value added of industries for the year 1970-71 in the state economy. A comparative analysis between two types of industries has been done on the basis of the income and labour coefficients as given in Table 8.2.

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1. For detailed methodology see Chapter 5.

In the later stage, the standard Leontief I-O inverse matrices have been used for derivation of the sectoral forward and backward linkages for both organized and unorganized sectors. The linkages have been estimated keeping in mind the output, income and employment generation objectives. They are named as output, income and employment linkages respectively. The industries which are having higher values of linkages, are defined as 'key industries'. These have been identified for both the organized and unorganized sectors of the state economy.

Table 8.1 reveals that total industrial output of the state is almost equally shared by the organized (49.6 percent) and unorganized (50.4 percent) sectors. It is also evident from the table that gur and khandsari, cotton textiles, oils, nonmetallic products, and grain mill products are the major industrial products of the state where the greater proportion of output is coming from the unorganized sector. On the other hand, sugar, cotton textiles, and power are the major industrial products of organized sector. Cotton textiles is coming from both the sectors, in which unorganized sector contributes more, i.e., 63 percent of the total output of the textiles in the state. It is also noted from Table 8.1, that 'sugar industry' in organized, and gur and khandsari industry in unorganized sector appeared to be the most prominent having their contributions of the order of 10.1 percent and

15.7 percent of the total industrial output of the state respectively in the year 1970-71. Oil industry in the unorganized sector contributed about 7 percent to the total industrial output of the state. The contribution of the six major industries in the state, namely, sugar, gur and khandsari, oils, textiles, grain mill and nonmetallic products was of the order of 60 percent of the total industrial output of the state in 1970-71. There have been some industrial products in 1970-71 which were produced only by the organized sector like sugar, vanaspati, cigar and cigarette, nitrogeneous fertilizers, synthetic rubber, power, water supply etc. due to their production technology. It is further observed that there was no single sector in the unorganized sector which was not produced by the organized sector in the concerned year.

The shares of value added of unorganized and organized sectors were 52.1 and 47.9 percent respectively. Taking industrial sector as a whole cotton textiles was the most prominent sector, contributing about 14 percent of the total value-added. Next, important industries are nonmetallic products, sugar and other textiles industries, each sharing about 10.0, 7.2 and 7.2 percent respectively in the total value added in the state economy for the year 1970-71.

For a comparative analysis, the direct income and employment changes have also been computed for the organized and unorganized industrial sectors of the economy. As defined

TABLE 8.1

MAJOR UNORGANIZED & ORGANIZED INDUSTRIAL SECTOR OF THE STATE U.P.

(Percentage Contribution to the Gross output & Value-added of Industries for 1970-71)

(Rs. In 1000)

MAJOR UNORGANIZED SECTORS

Sl. No.	Sector	Gross output		Value added	
		Unorganized	Organized	Unorganized	Organized

1.	Metal products	397767 (2.0035)	221038 (1.1134)	618805 (3.1169)	131393 (2.8332)
2.	Leather & Leather Products	213753 (1.0767)	117836 (0.5935)	331589 (1.6702)	95663 (2.0584)
3.	Wooden products	178539 (0.8993)	19643 (0.0989)	198182 (0.9983)	72166 (1.5561)
4.	Non metallic products	940833 (4.7390)	32592 (0.1642)	973425 (4.9032)	459262 (9.9029)
5.	Grain Mill products	598260 (3.0134)	485315 (2.4445)	1083575 (5.4579)	71053 (1.5320)
6.	Gum & Khandsari	3123541 (15.7327)	179533 (0.9043)	3303076 (16.6377)	221845 (4.7836)
7.	Oils	1428855 (7.1971)	331300 (1.6688)	1760155 (8.8659)	242056 (5.2258)
8.	Other tobacco int.	14638 (0.7376)	24509 (0.1255)	171347 (0.8631)	56718 (1.2230)
9.	Cotton Textiles	1481646 (7.4630)	864750 (4.3558)	2346396 (11.8188)	669004 (10.1129)
10.	Woolen Textiles	141365 (0.7120)	92627 (0.4666)	233992 (1.1786)	47498 (1.0242)
11.	Silk Textiles	92295 (0.4649)	33995 (0.1712)	126290 (0.6361)	33560 (0.7236)
12.	Other Textiles	367977 (1.8535)	266009 (1.3399)	633986 (3.1934)	240427 (5.1842)
13.	Total	10009411 (50.4176)	9843572 (49.5824)	19852983 (100.00)	2414271 (52.0575)

MAJOR ORGANIZED SECTORS OF THE STATE U.P.

1.	Electrical Equipments	30234 (0.1523)	396330 (1.9963)	426564 (2.1486)	10264 (0.2213)
2.	Transport Equipments	100271 (0.5048)	443389 (2.2334)	543606 (2.7382)	43308 (0.9338)
3.	Nonferrous metals	293963 (1.4807)	42456 (2.1380)	718419 (3.6187)	58619 (1.2640)
4.	Grain Mill products	598260 (3.0134)	485315 (2.4445)	1083575 (5.4579)	71053 (1.5320)
5.	Sugar	- ( - )	2010540 (10.1272)	2010540 (10.1272)	- ( - )
6.	Vannaspatti	- ( - )	453970 (2.2867)	453970 (2.2867)	- ( - )
7.	Cotton Textiles	1481646 (7.4630)	864750 (4.3558)	1481646 (7.4630)	669004 (10.1129)
8.	Power	- ( - )	699422 (3.5231)	699422 (3.5231)	- ( - )
Total		10009411 (50.4176)	9843572 (49.5824)	19852983 (100)	2414271 (52.0575)

earlier, direct income change is measured as value-added coefficient and direct employment change as labour coefficients. Table 8.2 provides the value-added and labour coefficients for the organized and unorganized industrial sectors. The table reveals that almost all the industries in unorganized sector are having larger value-added coefficients than their counterparts in the organized sector. Similarly, in each industry the unorganized sector is more labour intensive than the organized sector as reflected by the higher labour coefficients. Silk industry, beverages industries and electrical equipments are almost ten times more labour intensive in the unorganized sector as compared with the organized sector. The difference in the labour coefficients can be attributed to two things, (i) the technique of production used by the sector, (ii) the nature of the product which is coming from the sectors. If the product is exactly similar, then obviously different techniques of production would reflect different labour coefficients for the sectors. If the product is different, it would then its technique of production would also be different which will makes the labour coefficient different for organized and unorganized sectors. For example, in silk industry, raw silk is being produced in the unorganized sector, which is more labour intensive and finished product of silk are coming from the organized sector which is relatively less labour intensive.

TABLE 8.2 INCOME & LABOUR COEFFICIENTS FOR UNORGANIZED & ORGANIZED SECTORS

Sectors No.	Value added/ output		Labour/output	
	Organized	Unorganized	Organized	Unorganized
1	2	3	4	5
2	0.1480 (22)	0.3395 (15)	2.8385 (24)	17.5167 (15)
3	0.4045 (4)	0.4321 (7)	7.1844 (7)	22.078 (8)
4	0.1754 (18)	0.3127 (20)	4.3762 (15)	8.729 (24)
5	0.1013 (27)	0.3303 (17)	5.1222 (12)	13.3239 (20)
6	0.2344 (13)	0.2880 (22)	3.8252 (20)	12.5142(22)
7	0.1770 (17)	0.1994 (25)	0.8934 (36)	1.1915 (30)
8	0.4123 (3)	0.0948 (29)	2.2090 (29)	20.4238 (9)
10	0.1120 (24)	0.4466 (5)	4.9951 (13)	12.9406 (21)
11	0.2820 (9)	0.6247 (2)	14.6693 (1)	40.6865 (1)
12	0.0406 (30)	0.4042 (9)	8.5119 (4)	20.2102 (10)
13	0.0139 (35)	0.4881 (4)	8.2198 (5)	19.4137 (12)
14	0.0788 (29)	0.1726 (27)	1.6795 (32)	2.6929 (29)
15	0.0195 (32)	0.1788 (26)	5.4780 (11)	9.1240 (24)
16	0.0192 (34)	0.1188 (29)	0.8543 (39)	3.2879 (29)
18	0.1096 (26)	-	4.8534 (14)	13.6638 (19)
19	0.1669 (20)	0.3697 (12)	3.1334 (23)	-
20	0.1434 (23)	-	9.5865 (3)	8.1427 (25)
21	0.0129 (36)	0.0710 (30)	0.2780 (41)	-
22	0.0094 (37)	0.1696 (28)	0.9547 (34)	3.5602 (28)
23	0.4174 (2)	0.4356 (6)	2.3716 (26)	23.3129 (7)
24	0.3138 (7)	-	1.2106 (32)	-

1	2	3	4	5
25	0.0264 (31)	0.3873 (11)	0.0715 (28)	16.3871 (16)
40	0.1103 (25)	0.3165 (18)	5.8740 (9)	30.6091 (4)
41	0.1710 (19)	0.3360 (16)	7.5065 (6)	38.7297 (2)
42	0.0861 (28)	0.3636 (13)	4.1388 (18)	36.2188 (3)
43	0.2410 (12)	0.6534 (1)	3.7491 (21)	27.8242 (5)
44	0.1889 (15)	-	0.9170 (35)	-
45	0.3097 (8)	-	3.6442 (22)	-
46	-	-	-	-
47	0.1122 (26)	0.2803 (23)	4.3398 (16)	14.8469 (17)
48	0.2062 (14)	0.3585 (14)	4.0983 (19)	20.1010 (11)
49	0.3511 (5)	0.4227 (8)	10.0764 (2)	18.6354 (14)
50	0.1814 (16)	0.3165 (19)	2.3584 (27)	5.2241 (27)
51	0.2827 (10)	-	0.9748 (37)	-
52	0.1566 (21)	-	1.7940 (30)	-
53	0.0326 (31)	0.0326 (2)	4.2540 (7)	13.7121 (18)
54	0.0195 (33)	0.2342 (24)	0.8569 (38)	5.7960 (26)
55	0.2527 (17)	0.2909 (21)	2.6388 (25)	9.2280 (23)
56	0.3304 (6)	-	1.7786 (31)	-
58	-	-	0.4604 (40)	-
62	-	-	6.6340 (8)	24.3642 (6)
64	-	-	5.7329 (10)	18.7329 (13)

To understand the pattern of linkages detailed results are arranged in Table 8.3. A brief description of such results, pertaining to the different policy goals is given below.

(i) Output Linkages :

Output linkages for various industries in organized and unorganized sectors of the state economy are given in Table 8.3. As shown in the table, most of the industries in both the sectors are having higher backward linkages, than the forward linkages. The number of such industries for the unorganized sector is 28 out of 42 and for the organized sector it is 24 out of 42. Higher backward linkages means relatively more dependence of such industries for inputs on the other industries. There are some important industries in both the sectors which are showing higher forward linkages than the backward linkages. For example, nonferrous metals, wooden products, miscellaneous chemicals are a few leading industries in the unorganized sector which are having higher forward linkages than the backward linkages. Similarly, non-electrical equipments, metal products, iron and steel, cement and miscellaneous chemicals are the industries in organized sector which are having higher forward linkages than the backward linkages. Higher forward linkages means relatively more sales of intermediate inputs of such industries to the other sectors.

The ranking orders of the industries for backward and forward linkages are different for both organized and unorganized sectors, i.e., the industries which are having highest backward linkage are not the same as the industries which are having highest forward linkage in both the sectors. On the basis of the linkages some top ranked industries which are having higher magnitudes of linkage indices have been identified for both the sectors. Nonferrous metals, dairy products, metal products, cotton textiles and gur and khandsari are the industries in the unorganized sector and vanaspati, canning and preservation, drugs and pharmaceuticals, synthetic rubber and electrical equipments are the industries in the organized sector which are having top five ranks according to the backward linkage criterion. Iron and steel, nonferrous metals, miscellaneous chemicals, cotton textiles and wooden products are the industries which are having higher forward linkages in the unorganized sectors. They are, thus, major input suppliers to this sector. Similarly, cement, miscellaneous chemicals, water-supply, oils, and services are the top five ranked industries in organized sector which are having higher forward linkages. These industries are major input supplier to both of the sectors of the state economy.

Up till now, those industries are said to be as key industries which are having higher backward and forward linkage simultaneously. But, in this criterion those industries will

not be selected which are having very high forward linkage but low backward linkage and very high backward linkage but low forward linkage. So, to incorporate such industries, the index of total linkage is computed for each industry in both the sectors (see Table 8.3). The total linkage index is estimated by aggregating the magnitudes of forward and backward linkages. All the three indices, namely backward, forward and total linkage are used in selecting for the keysectors in the state economy for both the sectors (see Table 8.5).

Nonferrous metals, iron and steel, miscellaneous chemicals, cotton textiles and leather and leather products are among the industries in the unorganized sector, whereas, iron and steel, miscellaneous chemicals, power, oils and services in organized sectors are identified as key industries in the state economy on the basis of output linkages.

#### (ii) Income Linkages<sup>1</sup>

The income linkages for the industries in both the sectors of the state economy have been analyzed. As shown in Table 8.3, almost all the industries in the organized sector are having higher backward than forward income linkages, cotton textile sector is an exceptional industry in the organized

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1.

For the definition of income linkages and related discussions see Chapter Nos. 5 and 6.

sector which is showing higher forward income linkage than the backward linkage. There are 22 industries out of 42 in the unorganized sector which are having higher backward than the forward income linkage. Nonferrous metals, wooden products, grainmill products, cotton textiles, other textiles and miscellaneous chemicals are the industries in the unorganized sector which are having higher forward than backward income linkage. Ranking order (see Table 8.3) of the industries on the basis of the backward and forward income linkages differ significantly, as it was also found in the case of the output linkages.

Leather and leather products and textiles industries (Sector Nos. 40,42 and 43) are the industries in the unorganized sector and nitrogenous fertilizer, sugar, insecticides and pesticides, electrical equipments and drugs and pharmaceuticals in the organized sector which are having relatively higher income inducements through the backward income linkage in the state economy. On the other hand, iron and steel, textiles industries (sectors No. 40,42 and 43) and miscellaneous chemicals are the industries in the unorganized sector and power, water-supply, miscellaneous chemicals, transport equipments and iron and steel in the organized which are having higher forward income linkages. Power, misc. chemicals, w.p.f. materials, transport equipments and iron and steel in the organized sector and textile industries (Sector Nos. 40 and 42), iron and steel,

Sector	Output Linkage			Income Linkage			Employment Linkage		
	FL	BL	TL(T)	FL	BL	TL	FL	BL	TL
2	3	4	5	6	7	8	9	10	11
<b>2. Electrical Equipments</b>									
UOS	0.2970 (26)	0.4948 (17)	0.7918 (21)	1.4923 (23)	2.1519 (18)	3.6442 (21)	0.2666 (19)	0.3627 (19)	0.6293 (19)
OS	0.7785 (15)	0.9656 (6)	1.9441 (8)	0.3160 (22)	1.0673 (6)	1.0833 (22)	0.2723 (24)	0.4159 (30)	0.6683 (28)
<b>3. Transport Equipments</b>									
UOS	0.3173 (22)	0.4433 (24)	0.7606 (22)	2.0295 (14)	2.3345 (14)	4.3644 (13)	0.3590 (15)	0.4541 (10)	0.8131 (11)
OS	0.9251 (11)	1.0764 (21)	2.8015 (20)	0.0473 (6)	0.4336 (24)	0.4808 (6)	0.7458 (7)	0.6842 (19)	1.4305 (10)
<b>4. Non Electrical Equipmts.</b>									
UOS	0.3605 (18)	0.6195 (6)	0.9802 (11)	1.7007 (21)	2.6270 (8)	4.3278 (14)	0.1610 (24)	0.3216 (24)	0.4826 (24)
OS	1.1241 (13)	0.8817(16)	2.0057(17)	0.0194 (17)	0.6718 (16)	0.6912 (17)	0.4295 (16)	0.4853 (22)	0.9149 (25)
<b>5. Metal products</b>									
UOS	0.3829 (15)	0.6379 (3)	1.0208 (9)	1.8719 (18)	2.5429 (11)	4.4149 (12)	0.2614 (20)	0.3063 (27)	0.5678 (23)
OS	1.6336 (8)	1.1934 (32)	2.8270 (16)	0.0136 (23)	0.3257 (28)	0.3393 (23)	0.6109 (12)	0.4344 (26)	1.0452 (22)
<b>6. Iron &amp; Steel</b>									
UOS	1.1301 (1)	0.5961 (10)	1.7262 (2)	4.8171 (1)	2.3838 (15)	7.2009 (2)	0.7246 (3)	0.3757 (14)	1.1100 (9)
OS	0.9756 (4)	0.9463 (11)	1.9218 (3)	0.0458 (7)	0.7120 (15)	0.7578 (7)	0.6630 (10)	0.4767 (23)	1.1397 (21)
<b>7. Non Ferrous Metals</b>									
UOS	0.9902 (2)	0.7908 (1)	1.7810 (1)	2.9225 (8)	2.4840 (12)	5.4063 (7)	0.0604 (27)	0.1775 (30)	0.2379 (30)
OS	0.7338 (12)	3.1465 (26)	3.8802 (21)	0.0206 (18)	0.4379 (25)	0.4586 (18)	0.0925 (33)	0.1493 (38)	0.2415 (40)
<b>8. Cement</b>									
UOS	0.3676 (20)	- (-)	- (-)	2.1116 (11)	2.2412 (17)	4.3898 (15)	0.3847 (10)	45.0459 (1)	45.4306 (1)
OS	1.2963 (3)	0.8183 (36)	2.1145 (9)	0.0361 (8)	0.6659 (17)	0.7020 (8)	0.1720 (21)	5.1382 (1)	5.3102 (1)
<b>10. Leather &amp; Leather Products</b>									
UOS	0.5363 (8)	0.5714 (11)	1.1077 (5)	3.5446 (4)	3.6286 (1)	7.1732 (3)	0.3556 (14)	0.3810 (15)	0.7367 (17)
OS	0.7105 (3)	0.9427 (27)	1.6532 (31)	0.0095 (30)	0.2731 (29)	0.2826 (30)	0.3765 (20)	0.6904 (18)	1.0669 (23)
<b>11. Glass &amp; Glass Products</b>									
UOS	0.3353 (21)	0.3740 (26)	0.7093 (26)	3.1095 (6)	3.1680 (6)	6.2665 (4)	0.6991 (4)	0.7204 (4)	1.4196 (40)
OS	0.8113 (17)	1.0317 (18)	1.8430 (25)	0.0273 (11)	0.4528 (23)	0.4801 (11)	1.2627 (1)	1.2629 (3)	2.5255 (2)
<b>12. Wooden Products</b>									
UOS	0.5492 (6)	0.4648 (20)	1.0140 (18)	3.2853 (5)	1.9225 (22)	5.2078 (10)	0.5687 (8)	0.5676 (8)	1.1363 (8)
OS	0.8694 (16)	0.7540 (39)	1.6234 (34)	0.0042 (33)	0.2410 (30)	0.2452 (33)	0.7851 (6)	0.7013 (17)	1.4365 (11)
<b>13. Non-Metallic products</b>									
UOS	0.2970 (27)	0.6115 (7)	0.9085 (15)	2.1453 (12)	2.6078 (9)	4.7531 (11)	0.2954 (17)	0.4905 (9)	0.7859 (12)
OS	0.7365 (21)	0.7530 (40)	1.5195 (38)	0.0013 (38)	0.0762 (38)	0.0775 (38)	0.6859 (9)	0.6274 (20)	1.3133 (14)

**NOTATIONS :**

FL = Forward Linkage  
 BL = Backward Linkage  
 TL = Total Linkage

**Nota :** Figures in parentheses indicates ranks.



46. Phosphate Fertilizer

UOS	0.2948 (31)	0.2948 (28)	0.5897 (31)	2.9282 (2)	2.9534 (13)	0.2841 (23)	0.9587 (8)	1.2428 (16)
CS	0.7353 (28)	1.5668 (1)	2.3020 (6)	0.0272 (13)	-	-	-	-

46. Potassic Fertilizers

UOS	0.2948 (31)	0.2948 (28)	0.5897 (31)	-	-	-	-	-
CS	0.5860 (28)	0.6771 (1)	1.3632 (6)	-	-	-	-	-

47. Rubber Products

UOS	0.4369 (9)	0.5492 (13)	0.9862 (7)	1.8579 (27)	3.6705 (20)	0.3324 (16)	0.4741 (11)	0.7665 (15)
CS	0.8227 (20)	1.1284 (14)	1.9511 (19)	0.9655 (9)	0.9766 (24)	0.3738 (19)	1.2415 (5)	1.6205 (7)

48. Paper & Paper Products

UOS	0.3533 (21)	0.4983 (18)	0.8516 (19)	2.2009 (21)	4.0755 (17)	0.3639 (12)	0.4999 (10)	0.8632 (10)
CS	1.0448 (10)	1.0285 (19)	2.0732 (13)	0.7820 (13)	0.8077 (14)	0.4543 (13)	0.7963 (12)	1.2506 (15)

49. Printing & Publishing

UOS	0.2948 (31)	0.3539 (27)	0.6487 (31)	2.0555 (20)	3.8998 (19)	0.2815 (13)	0.3292 (23)	0.6107 (20)
CS	0.6800 (37)	1.0265 (20)	1.7066 (28)	0.9130 (11)	0.9415 (15)	0.7269 (7)	0.9514 (4)	1.6764 (3)

50. Paints & Varnishes

UOS	0.3038 (31)	0.5003 (16)	0.8041 (22)	1.9127 (7)	3.3397 (29)	0.0813 (30)	0.2609 (26)	0.3422 (29)
CS	0.7008 (34)	1.2632 (5)	1.9640 (31)	1.0537 (26)	1.0689 (24)	0.1753 (29)	0.5523 (21)	0.7276 (28)

51. Synthetic Rubber

UOS	0.2948 (31)	0.2948 (28)	0.5897 (31)	0.5795 (21)	0.6033 (16)	0.0727 (38)	0.1943 (36)	0.2670 (39)
CS	0.7031 (33)	0.9345 (28)	1.6376 (34)	2.0237 (16)	2.3368 (4)	0.1735 (30)	0.4350 (27)	0.6085 (29)

52. Insecticides & Pesticides

UOS	0.2948 (31)	0.2948 (28)	0.5897 (31)	2.3368 (4)	2.3399 (20)	0.1735 (30)	0.4350 (27)	0.6085 (29)
CS	0.9117 (14)	1.2655 (4)	2.1772 (7)	0.0171 (20)	0.0171 (20)	0.0171 (20)	0.0171 (20)	0.0171 (20)

53. Drugs & Pharmaceuticals

UOS	0.2948 (31)	0.4505 (22)	0.7453 (25)	2.8105 (7)	5.2388 (9)	0.2072 (23)	0.3516 (12)	0.5569 (24)
CS	0.7130 (32)	1.2254 (9)	1.9384 (20)	1.2265 (8)	1.2293 (34)	0.3218 (21)	0.4905 (11)	1.1523 (19)

54. Soaps & Glycerines

UOS	0.3019 (23)	0.6087 (8)	0.9106 (14)	1.7124 (28)	2.7589 (26)	0.08967 (32)	0.2053 (25)	0.3959 (23)
CS	0.6971 (38)	1.2182 (10)	1.9154 (21)	0.2586 (32)	0.2602 (37)	0.0634 (36)	0.3337 (17)	0.7671 (14)

55. Misc. Chemicals UOS

UOS	0.8633 (3)	0.4747 (19)	1.3381 (3)	1.6222 (25)	5.3396 (8)	0.4082 (9)	0.3741 (17)	0.7023 (14)
OS	2.5807 (1)	1.0605 (17)	3.6412 (1)	0.6742 (18)	0.7522 (4)	0.7225 (8)	0.7416 (15)	1.4264 (12)

56. Power

UOS	0.3918 (14)	0.2948 (28)	0.6867 (25)	0.6687 (19)	0.7446 (3)	0.4010 (18)	0.1545 (37)	0.2670 (32)
OS	2.1252 (2)	0.9523 (24)	3.0774 (2)	0.0899 (3)	0.0899 (3)	0.0899 (3)	0.0899 (3)	0.0899 (3)

56. Water Supply

UOS	0.2948 (31)	0.2948 (28)	0.5897 (31)	0.2432 (33)	0.3003 (5)	0.0371 (37)	0.0741 (40)	0.1172 (42)
OS	0.7598 (29)	0.9055 (31)	1.6653 (30)	0.0571 (5)	0.0571 (5)	0.0571 (5)	0.0571 (5)	0.0571 (5)

60. Services

UOS	0.2948 (31)	0.2948 (28)	0.5897 (31)	-	-	-	-	-
OS	8.4192 (5)	1.2394 (8)	2.6586 (5)	-	-	0.9989 (2)	0.7648 (13)	1.7636 (14)

64. Others

UOS	0.6191 (5)	0.2948 (28)	0.9089 (16)	0.0566 (30)	0.2675 (2)	0.5904 (5)	0.2830 (28)	0.6734 (10)
OS	1.3985 (6)	0.6888 (43)	2.0853 (11)	0.1870 (2)	0.2675 (2)	0.8506 (4)	0.4193 (28)	1.2699 (16)

leather and leather products, nonferrous metals and glass and glass products in the organized sector are having higher magnitudes of the total linkages. On the basis of the criteria discussed above, the list of key industries in both the sectors of the state economy is given in Table 8.5.

### (iii) Employment Linkages

Employment linkages for various industries in the organized and unorganized sectors of the state economy are given in Table 8.3. As shown in the table, most of the industries in both the sectors are having higher backward employment linkage than the forward linkages. The number of such industries for the unorganized sector is 26 out of 42 and for the organized sectors it is 33 out of 42. Glass and glass products is the industry in the organized sector and wooden products and services in the unorganized sector which are having almost equal forward and backward employment linkages. Cotton textiles, miscellaneous chemicals and w.p.f. materials are the industries in the unorganized sector which are having higher forward than the backward employment linkage, whereas, transport equipments, nonmetallic products, power, services and w.p.f. materials are the industries in the organized sector which are having higher forward employment linkage than the backward.

Linkage effect	Output Linkage	Income Linkage	Employment Linkage
<b>(1) UNORGANIZED SECTOR</b>			
(a) Backward Linkage	4(6), 5(3), 6(9), 7(1), 13(7), 14(2), 20(5), 40(4), 42(10), 54(8)	4(5), 10(1), 11(4), 13(9), 40(6), 43(3), 50(8), 53(7), 42(2), 5(10)	3(10), 8(1), 11(4), 12(8), 13(9), 20(6), 40(3), 41(5), 42(2), 43(7)
(b) Forward Linkage	6(1), 7(2), 10(7), 12(6), 40(4), 42(8), 43(10), 47(9), 55(3), 64(5)	6(1), 7(8), 10(4), 11(6), 12(5), 40(7), 42(9), 43(2), 53(10), 55(3)	6(3), 8(10), 11(4), 12(8), 40(1)
(c) Total Linkage	5(9), 6(2), 7(1), 10(5), 12(8), 14(6), 20(10), 40(4), 42(7), 55(3)	7(7), 10(3), 11(4), 12(10), 40(5), 42(6), 43(1), 53(9), 55(8), 6(2)	6(9), 8(1), 11(4), 12(8), 40(2), 41(5), 42(3), 43(7), 48(10), 64(9)
<b>(2) ORGANIZED SECTOR</b>			
(a) Backward Linkage	2(6), 15(3), 19(7), 21(2), 46(1), 51(5), 53(4), 54(9), 55(10), 62(8)	2(6), 15(9), 19(5), 44(2), 45(2), 47(8), 52(4), 53(7), 64(3), 49(10)	8(1), 11(3), 15(7), 16(3), 19(2), 20(10), 40(6), 45(8), 47(5), 49(9)
(b) Forward Linkage	5(8), 6(7), 8(3), 22(4), 44(9), 49(10), 55(1), 58(2), 62(5), 62(6), 64(8)	3(5), 6(6), 8(7), 23(8), 43(9), 55(3), 56(2), 58(4), 64(1), 11(10)	3(7), 6(10), 11(1), 12(6), 13(9), 20(5), 24(3), 49(7), 55(8), 62(2), 64(4)
(c) Total Linkage	2(8), 6(3), 8(9), 15(10), 22(4), 46(6), 53(7), 55(1), 58(2), 62(5)	3(5), 6(6), 8(7), 11(10), 23(8), 25(3), 43(9), 55(4), 64(1), 56(2)	3(10), 8(1), 11(2), 16(9), 19(3), 20(5), 40(6), 47(7), 49(8), 62(4)

Source : Table 8.3

Note :- Numbers in parenthesis indicate ranks, outside numbers related to sector Numbers as defined in IO table.

Ranking orders of the industries on the basis of the backward, forward and total employment linkages for the industries of the organized sector differ significantly, as it was found in the case of output and income linkages. But, the same is not true, in the case of the industries of the unorganized sector. It was found that the ranking order on the basis of the backward-forward and total linkages doesn't differ significantly. This implies that the industries which are having higher backward linkage are the same as the industries which are having higher forward or total linkage in the unorganized sector.

In the organized sector, cement, glass and glass products, grain mill products, sugar, cotton textiles and rubber products are the industries which are having higher backward employment linkages. Wooden products, glass and glass products, gur and khandsari, cigar and cigarattes and services are the industries which are having both higher forward and backward linkages. Similarly, cement, glass and glass products, sugar , gur and khandsari, cotton textiles and services are the sectors which are having higher total linkages, in organized sector. Textile industries (Sector Nos. 40,41,42 and 43), glass and glass products and wooden products are the industries of the unorganized sector which are having higher backward, forward and total linkages simultaneously. A list of key-sectors which generate relatively higher employment

potentialities are given in Table 8.5 for both the sectors.

The choice of key industries would, however, be quite difficult if more than one objective of the planning are to be fulfilled simultaneously. This is because, it is not necessary, for an industry which is having higher output linkage, to have the higher income and employment linkages. The difference in the ranking order of the industries corresponding to the different plan objectives makes the problem of choice very complex.

This problem can be solved partly by identifying the conflict or association between the key industries corresponding to the various plan objectives by using the Venn Diagram approach<sup>1</sup>. The key industries related to the various plan objectives as demonstrated in Table 8.5, have been rearranged in the interlocked Venn diagrams, taking three plan objectives simultaneously for the organized and unorganized sectors separately (see Figs. 8.1 and 8.2).

The 1st Venn diagram which is for the organized sector, explains the situation where output, income and employment plan objectives considered simultaneously. It has been found that electrical equipments, iron and steel, nitrogenous fertilizer, and drugs and pharmaceuticals are the industries in the

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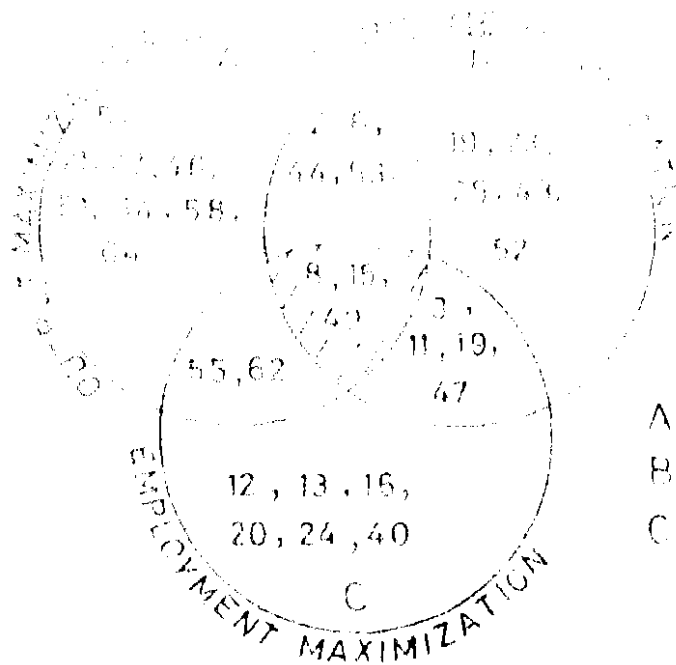
1. This approach is also used in Chapter 5.

TABLE 8.5 KEY SECTORS FOR ORGANIZED & UNORGANIZED  
INDUSTRIAL SECTORS FOR U.P. ECONOMY.

Organized Sectors	Output Linkage	Income Linkage	Employment Linkage
Key Sectors : Higher	2, 5, 6, 8, 15,	2, 3, 6, 8, 11,	3, 8, 11, 12, 13,
Backward, forward	21, 22, 44, 46,	15, 19, 23, 25,	15, 16, 19, 20, 24,
& Total Linkages	49, 51, 53, 54,	43, 44, 45, 47,	40, 47, 49, 55,
	55, 58, 62, 64	49, 52, 53	62.
Unorganized Sector:	4, 5, 6, 7, 10, 12,	4, 6, 7, 10,	3, 6, 8, 10, 11, 12,
Key Sectors: higher	13, 14, 20, 40,	11, 12, 13, 40,	13, 40, 41, 42, 43,
Backward, forward	42, 43, 47, 54,	42, 43, 50, 53,	48, 55, 64
& total linkage.	55, 64.	55.	

organized sector which maximize output and income, whereas misc. chemicals and services are the industries which satisfy the output and employment plan objectives. Transport equipments, glass and glass products sugar and rubber products are the industries which satisfy the income and employment objectives simultaneously. Cement, canning and preservation and printing and publishing are very crucial industries in the organized sector for U.P.'s economy, because these industries satisfy all the three plan objectives at a time. But, the major demand of cement in the state is satisfied through imports from other states and other two industries have very little share in total industrial output of the state, so their impact on the economy is very insignificant at present. An important policy implication of this analysis is that production of cement should be encouraged within the state which will generate a sizable amount of output, income and employment for the economy. Moreover, cement has very high forward linkage for the organized and unorganized sectors, which implies its being used as a major input in the other industries. Similarly, the other two industries - canning and preservation, and printing and publishing are also quite important for the development of the state economy.

The second Venn diagram (Fig. 8.2) is for the unorganized sector, which reveals that nonelectrical equipments and non-ferrous metals are the industries which maximizes output and



A- Output maxim. objective  
 B- Income maxim. "  
 C- Employment maxim. "

FIG.81 VENN DIAGRAM ANALYSIS OF THE INDUSTRIES OF THE ORGANIZED SECTOR OF THE STATE ECONOMY

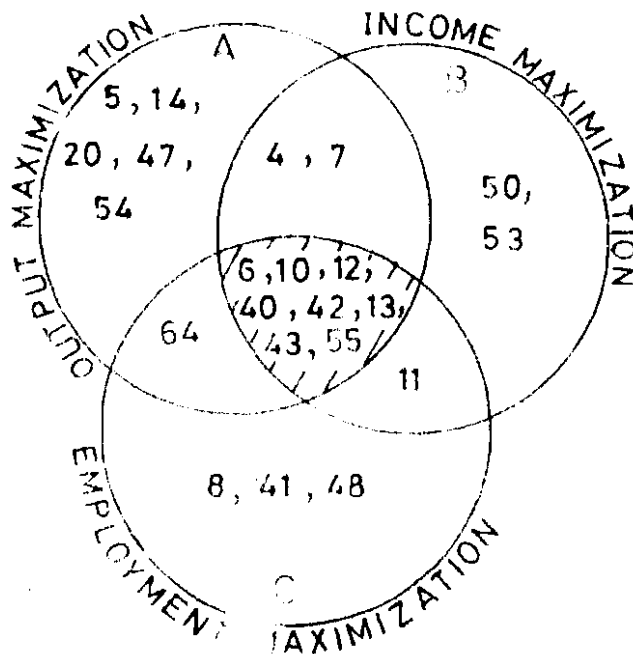


FIG.82 VENN DIAGRAM ANALYSIS OF THE INDUSTRIES OF THE UNORGANIZED SECTOR OF THE STATE ECONOMY

and income potentials, whereas, w.p.f. materials, fulfill the output and employment objectives and glass and glass products is the industry which satisfy income and employment objectives at a time. In the unorganized sector of the state, the industries - leather and leather products, wooden products, cotton textiles, silk industry, other textiles and nonmetallic products are the crucial sectors which satisfy all the plan objectives simultaneously. So, development of these sectors should be encouraged in the unorganized sector in order to generate a sizable amount of output, income and employment potentialities simultaneously. Iron and steel and misc. chemicals are also coming in to this Venn diagram, because of their high forward linkages for the high forward linkages for the unorganized sector. This implies that iron and steel and misc. chemicals though being produced in the organized sector but emerging as major input supplier to the unorganized sector. Hence, iron and steel, misc chemicals along with cement should be given priority in the organized sector in order to develop the unorganized industrial sector in the state economy.

#### 8.4 SUMMARY OF MAIN EMPIRICAL RESULTS AND POLICY IMPLICATIONS

(i) Organized and unorganized industries are having almost equal share of the total industrial output of the state.

(ii) There are few industrial products such as, sugar, vanaspati, cigar and cigarettes, nitrogeneous fertilizer, phosphetic fertilizer, synthetic rubber, insecticides pesticides and power which are only being produced in the organized sector. However, there exist no single product in the state which is only being produced in the unorganized sector.

(iii) On the basis of the direct income and employment changes, industries of the unorganized sector are more income and labour intensive than the industries of the organized sector.

(iv) Almost all the industries are having higher backward (output, income and employment) linkage than the forward linkage for both the organized and unorganized sectors.

(v) In the organized sector of the state economy the leading i.e., key industries corresponding to the different plan objectives are as follows :

Iron and steel, electrical equipments, nitrogeneous fertilizer and drugs and pharmaceuticals are the industries which maximize output and income, whereas misc. chemicals and services are the industries which are showing higher output and employment linkages simultaneously. On the other hand, transport equipments, glass and glass products, sugar and rubber products are the industries which satisfy income and employment plan objective at a time. Cement, canning and preservation and printing and publishing are the crucial industries for the

economy because, these are satisfying all the three plan objectives simultaneously.

(vi) In the unorganized sector of the state economy, non-electrical equipments, metal products, gur and khandsari are showing higher output linkages, whereas wooden products and printing and publishing are having higher employment linkages and leather and leather products has higher income linkage. Nonferrous metals satisfy output and income objectives simultaneously whereas misc. chemicals and glass and glass products maximizes income and employment both. Silk and other textiles industries and nonmetallic products are among the industries which satisfy all the three plan objectives simultaneously.

(vii) Iron and steel and misc. chemicals are major input supplier to the unorganized sector. These two industries along with cement are also the main input supplier to the organized sector of the state economy. This implies that production of these industries viz., iron and steel, misc. chemicals and cement should be given priority in development of the industrial sector of the state economy.

The analysis of the interindustrial interactions among the organized and unorganized sectors is not possible at this stage,

because, this requires some more statistical information,  
which is, not available at the state level at present.