

Sectoral Interdependence And Identification Of Key Sectors In Uttar Pradesh Economy

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I. The purpose of this paper is to examine sectoral interdependence and hence to identify the key sectors in the economy of Uttar Pradesh. Such study, on the one hand, will help in understanding the structure of the state economy and on the other hand, it's findings will be useful in development planning for the state economy.

The sectoral interdependence will be estimated through the interindustry linkages with respect to different goals of the state economy, such as the expansion of output, increase in income, equity and employment generation. Based on the estimates of those linkages, the relative importance of the sectors can be identified and thus priorities for their development can be ascertained.

II. The Methodology and Data-base of the Study :

The type of study we propose to do here is conventionally done in Input-Output (I-O) frame-work. Rasmussen (1952) and Hirschman (1958) suggested the technique to compute interindustrial linkages. This technique with some modifications is being followed by us in the paper. The technique has been widely followed in India (Ref. to Hazari (1970), Kashyap (1979), Alagh et al. (1980) and Srivastav (1985) and abroad (Ref. to Karunaratne (1976), Bulmer (1978), Beyers (1976), Augustinovics (1972), Rao-Harntson (1979), Diamond (1974), Hewings (1974) Laumas (1975, 1976, May '76) to study the intersectoral linkages within different economies. Briefly, this technique may be summarised as follow : Let the standard open static Leontief Input-Output model be expressed as

$$X = [I - A]^{-1} F, \quad \dots \dots \dots (1)$$

Where X = output vector for n sectors of the state economy, F = the corresponding Final demand vector. I = the (n × n) identity matrix and A = the (n × n) matrix of input-output coefficients (i. e. the technology matrix).

From relation (1), since we have

$$D \cdot X = D \cdot [I - A]^{-1} F, \quad \dots \dots \dots (2)$$

where D = diagonal matrix of coefficients for a particular characteristic ; its ith

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diagona element D_{ii} being the ratio of the *characteristic* per unit output for the i th sector, we get,

$$Z = D [I - A]^{-1} \quad \dots \quad \dots \quad \dots \quad \dots \quad (3)$$

= the linkage matrix for the *characteristic*: its element Z_{ij} being the amount of the *characteristic* generated by i th sector for a unit increase in the final demand of j th sector.

In the present paper, the coefficient matrix D is denoted by I, V, V_p and L respectively for the *characteristic* of (i) output, (ii) income (or total value-added), (iii) equity (here, standing for the share of total value-added generated that goes to the poorest third of people, belonging to the bottom income class) and (iv) labour (or employment). The corresponding linkage matrix Z is denoted respectively by R, Y, E and N . Next following what Rasmussen (1952) defined from the matrix R , we have computed analogically from any linkage matrix $Z = R, Y, E$ or N , the two indices, called (i) the index of backward linkages w_j and (ii) the index of forward linkages u_j for a j th sector, which have the following formulations.

$$w_j = \left(\sum_{i=1}^n Z_{ij} \right) / \left(\sum_k \sum_i Z_{ik} \right), \quad \dots \quad \dots \quad \dots \quad \dots \quad (4)$$

with the critical value $\bar{w} = 1$,

$$\text{and } u_j = \left(\sum_{i=1}^n Z_{jt} \right) / \left(\sum_k \sum_i Z_{ik} \right), \quad \dots \quad \dots \quad \dots \quad \dots \quad (5)$$

with the critical value $\bar{u} = 1$.

Clearly w_j is proportional to the total amount of the *characteristic* generated by all sectors for a unit increase in the final demand of j th sector. whereas u_j is proportional to the total amount of the *characteristic* in sector j for a unit increase in final demand in each of all sectors. Here the value of $w_j > 1$ is taken to indicate high backward linkage in the sense that this sector generates above average level of response in other sectors, while the value of $u_j > 1$ indicates high forward linkage in the sense that this sector displays above average level of dependency on other sectors.

The major source of data for this study is the Input-Output table prepared by the State Planning Institute (1975), Lucknow. The inter-sectoral flows for 1970-71 are expressed in Rupees thousand at 1970-71 producers prices in this table. The labour coefficients used were those computed by Srivastava and Lal (1978) for the sixty four sectors of the state economy. The data on the share of sectoral value added in the bottom income class for the state could only be established by granting

the all-India distribution as valid for the state. The sectoral value added have been distributed among the bottom income class in the same proportion as in the case study for Indian economy done by Sinha et al. (1980). A list of sixty four sectors with their code numbers is given in the appendix (see column 1, table 1).

III. Discussion of Empirical Result :

The estimates of forward linkage index u_j and backward linkage index w_j for output, income, equity, and employment have been tabulated separately for 64 sectors of the state economy in table (1) of the Appendix. The ranks of the sectors have also been recorded in the same table in respect of each of these eight linkage indices. The analysis is aimed here at identifying the key sectors that needed more emphasis in future in order to satisfy the different policy objectives, like the improved generations of output, income, equity or employment. Clearly for fulfilment of any individual objective, the key sectors are those which have pronounced values of U_j and w_j or their average, much above, pay, unity. So, in table (2) of the Appendix, we have recorded only the key sectors (in code numbers) showing high values ($u_j > 1$, $w_j > 1$) of forward and backward linkages and their average (or total). The relative positions of key sectors can also be identified for each policy objective from the data on ranks given in the table.

One can now easily identify the key sectors that could be given priorities in future planning measures for fulfilment of any individual policy objective, say output maximisation, or income maximisation, or equity maximisation, or employment maximisation. But the task of identifying the priority sectors for fulfilment of multiple objectives is very difficult. This can be observed from the appendix table (2) that there exist hardly any sector in the state economy which shows high backward and forward linkages for all the four policy objectives. This reflects a certain degree of incompatibility between the objectives. On the basis of ranking orders for linkage indices, backward, forward and total, corresponding rank correlation coefficients have been computed to examine the areas of conflict and compatibility among the various plan objectives (See table 1).

TABLE 1 Rank Correlations Of Linkage-Indices—U. P. S 64 x 64 model

Linkages	Backward Linkages based on				Foward Linkage based on				Total Linkage Based on			
	X	Y	E	N	X	Y	E	N	X	Y	E	N
1	2	3	4	5	6	7	8	9	10	11	12	13
1. X	1.00				1.00				1.00			
2. Y	0.05	1.00			0.55	1.00			0.04	1.00		
3. E	0.03	0.27	1.00		0.33	0.26	1.00		0.21	0.54	1.00	
4. N	0.03	0.44	0.40	1.00	0.46	0.59	0.29	1.00	0.15	0.64	0.43	1.00

From the values of rank correlation coefficients of the correlation matrices, particularly those shown for backward and total linkages in table 1, we can infer that there is a low degree of correspondance between output maximization and other policy

variants, whereas higher degree of correspondance among the income, equity and employment maximization policies. So, it can be suggested that any industrialization strategy based on output inducement impacts, like output maximization (Hirschman strategy) will not fulfil the other policy objectives like income, employment and equity maximization, whereas income maximization policy has some positive impact on employment and equity objectives.

The coexistence of multi-objectives simultaneously and the conflicts among the key sectors for various plan objectives can best be demonstrated by using interlocking Venn diagrams. Priority sectors have been rearranged in the inter-locked Venn diagrams for each policy objective. Three plan objectives, out of four are taken at a time for convenience. The over-lapping areas show the compatability of different objectives. The most noticeable is the absence of sectors lying in area of maximum convergence (shaded areas in the Figures 1, 2 & 3) suggesting a serious intersectoral policy conflicts.

First Venn diagram (Fig. 1) represents the situation where income-output-equity maximization plan objectives are taken at a time. It is found that services (62) and Cotton-Textiles (40), Oils (22) and Miscellaneous Chemicals (55) satisfy the equity and output plan objectives. Further, Pulses (27), Fruit-Vegetable and Spices (36), Animal Husbandry (37) and Cotton Textiles (40) are the sectors which satisfy the equity and income plan objectives simultaneously. Out of these, cotton textile sector is common in all the alternatives. Hence, this sector fulfil all the three equity-income-output maximization plan objectives at a time. The second Venn diagram (Fig. 2) demonstrates income-employment-equity plan objectives at a time. Agricultural sectors (sector Nos—28, 29, 30, 31, 32 and 35), Forestry (39) and Services (62) are fulfilling the income, employment plan objectives. On the other hand, Animal-Husbandry (37) and Fruit-Vegetable and Spices are the sectors which satisfy the income-equity plan objectives. However, cereals (26) sector fulfil equity and employment policy objectives at a time. In this Venn diagram Pulses (27) and Cotton textile (40) sectors fulfil all the three plan objectives simultaneously.

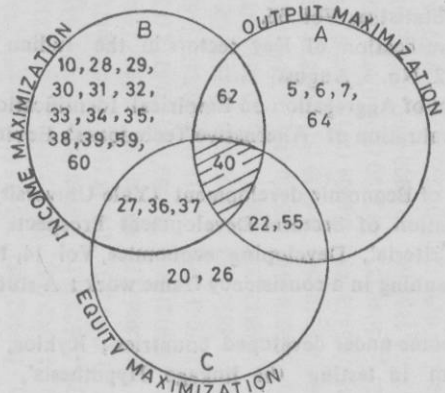
Fig. 3 demonstrates the employment-equity-output plan objectives at a time, in which Services (62) and Wrapping, packing and Filling materials (64) and Cotton Textiles (40) satisfy the employment and output plan objectives, whereas, cereals (26), Pulses (27) and cotton textiles (40) sectors fulfil the employment-equity plan objectives. Likewise, cotton textiles (40), oils (22) and Miscellaneous Chemicals (55) satisfy the equity and output maximization plan objectives. However, it is interesting to note that cotton textiles sector (40) lies in Fig. 3 in the shaded area of maximum convergence, which satisfy all the three plan objectives at a time. Hence, the cotton-textile sector is a very crucial sector for U. P's economy which satisfy, by and large, all the four plan objectives viz.-output, income, equity and employment maximization simultaneously. (see-shaded are in Fig. 1, 2 & 3).

IV. Summary and Conclusion :

The Leontief open I-O model has been used to compute sectoral backward, forward and total linkages in U. p. 's economy. On the basis of such linkage, indices the key sectors have been identified corresponding to different plan objectives like income, output, equity and employment maximization for the state economy. It is found that Metal Products, Iron & Steel, Non-ferrous Metals, Oils, Cotton Textiles, Miscellaneous Chemicals and Services are the key sectors for output maximization. Whereas, Agricultural products, Leather & Leather Products, Cotton textile, Transport and Services sectors are the key sectors from the income generation point of view. Further, cereals, Cotton textiles, Miscellaneous Chemicals, Animal Husbandry, Gur & Khandsari, Oils, Pulses and Fruit—Vegetable and Spices are the sectors which are important from the point of view of equity maximization. The sectors which are maximizing the employment generation capacity in the state economy are Wooden Products, Agricultural Products and Textiles and Services.

The choice of key sectors is not that simple in the case of multiobjective planning strategy. A certain degree of incompatibility between the objectives reflected from the

VENN DIAGRAM ANALYSIS OF THE SECTORS OF THE STATE ECONOMY



- A = Priority sectors which maximize output level
- B = Priority sectors which maximize income potential
- C = Priority sectors which maximize equity
- D = Priority sectors maximize employment potential

FIG. 1

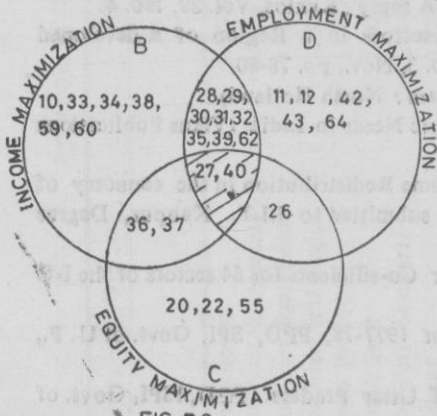


FIG. 2

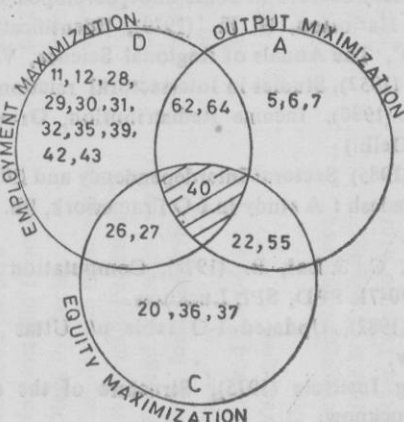


FIG. 3

Sectorial Interdependence and Identification of Key Sectors in Uttar Pradesh Economy

rank correlation analysis. It is found that there exists a low degree of correspondance between output maximization and other policy variants, whereas high degree of correspondance among the income, equity and employment maximization policies. The coexistence of multiobjectives simultaneously and conflicts among the key sectors for various plan objectives on the basis of Venn diagram analysis suggested that pulses sector of the state economy is quite important which shows higher income, equity and employment linkages at a time. Similarly, Cotton textile sector satisfies all the four plan objectives viz., output, income, equity and employment maximization simultaneously.

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Appendix Table : 1 Linkage Analysis of U. P.'s Economy : 1970-71

Code	Sector	Output Linkage			Income Linkage			Equity Linkage			Employment Linkage		
		u_j	w_j	u_j	u_j	w_j	u_j	u_j	w_j	u_j	u_j	w_j	
1	2	3	4	5	6	7	8	9	10				
1	Construction	0.6191 (61)	1.0907 (24)	0.0000 (60)	0.3933 (61)	— (47)	0.1673 (52)	0.2609 (42)	0.6580 (44)				
2	Electrical Equipments	0.8279 (30)	1.2225 (11)	0.6636 (35)	0.9310 (34)	0.0719 (39)	0.3340 (39)	0.2574 (43)	0.4659 (51)				
3	Transport Equipments	0.9014 (26)	0.9442 (38)	0.3675 (47)	0.4791 (59)	0.0635 (41)	0.1516 (53)	0.7175 (26)	0.7008 (42)				
4	Non Electrical Equips	0.8036 (34)	1.2000 (13)	0.8779 (28)	1.1298 (23)	0.0440 (44)	0.1263 (59)	0.8787 (37)	0.5310 (48)				
5	Metal Products	1.0499 (20)	1.1573 (21)	0.6748 (33)	0.7534 (44)	0.4436 (18)	0.3802 (36)	0.8747 (20)	0.6704 (43)				
6	Iron & Steel	2.0329 (4)	1.1280 (23)	1.4338 (16)	0.8005 (42)	— (47)	0.1060 (61)	0.6483 (28)	0.3982 (54)				
7	Non Ferrous metals	1.6249 (9)	1.1898 (15)	0.9341 (26)	0.7422 (45)	— (47)	0.2197 (45)	0.1291 (51)	0.2045 (58)				
8	Cement	0.6762 (47)	0.9121 (40)	0.3992 (45)	0.6172 (53)	— (47)	0.3392 (56)	0.1434 (49)	0.3099 (55)				
9	Mining	1.2800 (15)	0.7641 (50)	1.2911 (18)	0.7409 (46)	— (47)	0.0869 (63)	1.0455 (16)	0.5869 (46)				
10	Leather & Leather Products	0.9562 (24)	1.1856 (16)	1.8109 (10)	2.1606 (2)	0.1272 (35)	1.0067 (18)	0.7754 (23)	1.0916 (24)				
11	Glass & Glass Products	0.7573 (39)	0.9637 (35)	0.6711 (14)	0.8048 (41)	0.0337 (46)	0.4361 (32)	1.1717 (15)	1.2028 (19)				
12	Wooden Products	0.9600 (23)	1.0078 (31)	0.8450 (29)	1.1644 (21)	0.1202 (37)	0.2836 (40)	1.4660 (14)	1.7863 (10)				
13	Non-metallic Products	0.7271 (40)	0.9810 (34)	0.6839 (31)	0.8874 (38)	0.6201 (14)	0.6781 (23)	0.9891 (18)	1.0375 (26)				
14	Diary Products	0.7615 (38)	1.3483 (4)	0.8804 (27)	1.7509 (4)	0.1311 (34)	2.0751 (6)	0.1201 (54)	0.7640 (39)				
15	Canning and Preservation	0.7013 (42)	1.3089 (5)	0.2190 (55)	0.8773 (39)	0.0110 (47)	0.6367 (25)	0.3143 (40)	0.9157 (31)				
16	Grain mill Products	0.6977 (43)	1.2851 (6)	0.0000 (60)	0.7566 (43)	0.8733 (11)	7.5257 (2)	0.1229 (52)	1.7961 (9)				
17	Tea and Coffee processing	0.6191 (61)	1.0238 (28)	0.1247 (57)	0.8417 (41)	0.3373 (28)	0.5600 (30)	0.0394 (59)	1.5390 (14)				
18	Misc food preservation	0.8089 (33)	1.1769 (19)	0.2368 (54)	0.6783 (40)	0.2551 (26)	1.2322 (14)	0.6109 (29)	1.1321 (23)				
19	Sugar	0.7816 (35)	1.1464 (22)	0.5055 (40)	1.3098 (16)	0.7059 (12)	0.7138 (21)	0.1963 (46)	1.4185 (16)				
20	Cur and Khandsari	0.6.10 (50)	1.2120 (12)	0.2663 (51)	1.2817 (18)	1.1326 (8)	1.2568 (13)	0.4938 (35)	1.9197 (8)				
21	Vanaspati	0.6363 (55)	1.7018 (1)	0.3087 (49)	1.4588 (6)	0.4779 (17)	1.4239 (10)	0.0142 (61)	1.0217 (28)				
22	Oils	1.6358 (8)	1.2472 (9)	0.0510 (59)	1.4059 (10)	2.4057 (5)	1.1530 (16)	0.2215 (45)	1.9950 (20)				
23	Beverages Industries	0.6808 (46)	0.9268 (39)	0.2399 (53)	0.4831 (60)	0.1545 (32)	0.4360 (33)	0.1358 (50)	0.4361 (53)				
24	Cigar & Cigarettes	0.6191 (61)	0.8842 (42)	0.6256 (37)	0.9771 (32)	0.1259 (36)	0.2122 (47)	0.0601 (56)	0.3322 (55)				
25	Other Tobacco Manf.	0.6196 (60)	0.8817 (43)	0.4680 (42)	0.9060 (35)	0.2521 (27)	0.3578 (38)	0.7105 (27)	1.0436 (25)				
26	Cereals	1.1379 (17)	0.7975 (48)	0.9556 (24)	0.7192 (41)	19.0960 (1)	11.2358 (1)	3.6436 (6)	2.3126 (4)				
27	Pulses	0.9742 (22)	0.7756 (49)	1.7317 (11)	1.3275 (15)	1.8598 (7)	1.4312 (9)	1.7816 (10)	1.4288 (15)				
28	By products of agri.	1.0933 (19)	0.6223 (61)	1.9856 (7)	1.1283 (24)	0.3362 (24)	0.1923 (48)	4.3818 (4)	2.4827 (3)				
29	Oil Seeds	2.0517 (3)	0.7388 (54)	4.9431 (1)	1.6752 (5)	0.4174 (19)	0.2694 (42)	3.6996 (5)	1.3332 (17)				
30	Sugar Cane	1.6721 (7)	0.7402 (53)	3.2572 (3)	1.3771 (3)	0.2224 (31)	0.1383 (57)	4.6974 (3)	1.9444 (7)				
31	Cotton & Cotton seeds	0.8223 (32)	0.7498 (52)	1.6596 (13)	1.4243 (3)	— (47)	0.1512 (54)	3.0018 (7)	2.5073 (2)				
32	Potato	0.6571 (51)	0.7279 (55)	1.2598 (20)	1.3344 (4)	0.3426 (23)	0.4063 (4)	1.5554 (12)	1.6239 (11)				

Note : * Figures in parentheses indicate ranks, in reverse order of magnitudes of u_j and w_j .

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Contd Table (1)

Code	Sector	Output Linkage			Income Linkage			r-quity Linkage			Employment Linkage		
		u _j	w _j	u _j	u _j	w _j	u _j	u _j	w _j	u _j	w _j	u _j	w _j
No.	2	3	4	5	6	7	8	9	10				
33	Fibres	0.6259 (58)	0.7243 (56)	1.2883 (19)	1.4179 (9)	—	(47)	0.1495 (55)	0.7062 (41)				
34	Tabacco	0.9516 (25)	0.7564 (51)	1.9762 (8)	1.4559 (7)	0.1191 (38)	0.1283 (58)	0.5481 (31)	0.4594 (52)				
35	Other agricultural products	1.2897 (14)	0.6800 (58)	2.5364 (5)	1.3067 (17)	1.0090 (9)	0.5727 (29)	5.6522 (2)	2.8598 (1)				
36	Fruit Vegetable & spices	0.7765 (36)	0.6587 (60)	1.6705 (12)	1.3848 (12)	2.2783 (6)	1.8679 (7)	0.9691 (19)	0.8199 (36)				
37	Animal husbandary	1.3813 (11)	0.8482 (46)	3.1442 (4)	1.7666 (3)	8.7753 (3)	4.2670 (3)	0.8097 (22)	1.0255 (27)				
38	Fisheries	0.6715 (48)	0.7181 (57)	1.1252 (21)	1.0919 (27)	0.0473 (43)	0.1021 (62)	0.8248 (21)	0.8704 (34)				
39	Forestry	1.9232 (5)	0.6728 (59)	4.2166 (2)	1.3869 (11)	0.7824 (12)	0.2836 (40)	5.8916 (2)	1.2562 (6)				
40	Cotton Textiles	1.0967 (18)	1.2571 (8)	2.5162 (6)	2.5385 (1)	4.2128 (4)	3.7823 (4)	1.0087 (17)	1.5669 (13)				
41	Woolen Textiles	0.6839 (45)	1.0438 (26)	0.4757 (41)	1.1324 (22)	0.1415 (33)	1.5848 (8)	0.4369 (36)	0.9038 (32)				
42	Silk Industry	0.8950 (27)	1.1856 (16)	0.7484 (30)	0.9783 (31)	0.2241 (30)	0.5818 (28)	1.8161 (9)	2.0875 (5)				
43	Other Textiles	1.1919 (16)	0.3598 (37)	0.3483 (25)	0.9490 (33)	0.9232 (10)	1.1309 (17)	1.5114 (13)	1.1614 (22)				
44	Nitro geneous Fertilizer	0.7706 (37)	0.9985 (12)	0.9853 (23)	1.0941 (36)	—	(47)	0.0566 (57)	0.2684 (57)				
45	Phosphatic Fertilizers	0.6685 (49)	1.4798 (03)	0.3042 (50)	1.0113 (29)	—	(47)	0.1952 (47)	0.9211 (30)				
46	Potassic Fertilizers	0.6283 (57)	0.6191 (62)	—	(60)	—	(64)	—	(62)				
47	Rubber Products	0.8299 (29)	1.2247 (10)	—	(60)	0.5163 (56)	0.0325 (45)	0.4969 (34)	1.3038 (18)				
48	Paper & Paper products	0.9950 (21)	1.0125 (29)	0.4468 (43)	0.6625 (60)	0.3970 (20)	0.6862 (22)	0.5077 (33)	0.7856 (38)				
49	Printing & Publishing	0.6218 (59)	0.9910 (33)	0.3705 (46)	0.6427 (61)	0.2287 (29)	0.4655 (31)	0.6001 (30)	0.3871 (33)				
50	Paints & Varinishes	0.6492 (53)	1.2791 (7)	0.6500 (36)	1.0488 (28)	—	(47)	0.1438 (48)	0.6569 (45)				
51	Synthetic Rnubber	0.6429 (54)	0.8682 (45)	0.3387 (48)	0.4803 (58)	—	(47)	0.0502 (58)	0.7872 (59)				
52	Insecticides & Pesticides	0.3374 (28)	1.1997 (14)	0.5732 (38)	0.8929 (37)	—	(47)	0.1204 (53)	0.4946 (49)				
53	Drugs & Pharmaceuticals	0.6524 (52)	1.1820 (18)	0.2458 (52)	0.7078 (48)	0.5053 (16)	1.3399 (12)	0.2510 (44)	0.7930 (37)				
54	Soaps & Glycerine	0.6361 (56)	1.5258 (2)	0.0977 (58)	1.0034 (30)	0.0597 (42)	1.1834 (15)	0.1184 (55)	0.0356 (29)				
55	Misc. Chemicals	2.7015 (1)	1.0569 (27)	0.5708 (39)	0.5939 (54)	11.3498 (2)	3.1274 (5)	0.7533 (25)	0.7310 (40)				
56	Power	2.1775 (2)	0.3713 (44)	1.4743 (15)	0.6243 (52)	0.3748 (21)	0.1830 (49)	0.3104 (41)	0.1278 (60)				
57	Coal & Coke	1.3424 (6)	0.6191 (62)	1.5174 (14)	0.5099 (57)	0.5189 (15)	0.1744 (51)	—	(62)				
58	Water Supply	0.6976 (44)	0.8234 (47)	—	(60)	0.1483 (63)	0.0666 (40)	0.0257 (60)	0.0585 (61)				
59	Railway Transport	0.7057 (41)	0.8894 (41)	1.0718 (22)	1.1083 (25)	0.3262 (25)	0.3735 (37)	0.7614 (24)	0.8253 (35)				
60	Motor & Other Transport	0.8271 (31)	0.9607 (38)	1.3476 (17)	1.1786 (20)	0.6924 (13)	0.6171 (26)	0.3243 (39)	0.4661 (50)				
61	Trades & Commerce	0.6191 (61)	1.0116 (30)	0.4253 (44)	0.9022 (36)	—	(47)	0.3327 (38)	0.5746 (47)				
62	Services	1.3223 (12)	1.1614 (20)	1.3489 (9)	1.2536 (19)	—	(47)	2.5823 (8)	1.5717 (12)				
63	Petroliums products	1.2933 (13)	0.6191 (62)	0.6817 (32)	0.3261 (62)	0.3744 (22)	0.1792 (50)	—	(62)				
64	Others	1.5457 (10)	1.0749 (25)	0.1325 (56)	0.5930 (15)	—	(47)	0.6357 (26)	1.1951 (21)				

Sectoral Interdependence and Identification of Key Sectors in Uttar Pradesh Economy

Table 2 :
Linkage Analysis of U. P. S Economy : 1970—71

Sl. No.	Linkage effect	Output Linkage (Z)	Income Linkage (Y)	Equity Linkages (E)	Employment Linkage (N)
1	2	3	4	5	6
1.	High Forward Linkages	5(20), 6(04), 7(9), 9(15), 22(8), 26(17), 28(19), 29(3), 30(7), 35(14), 37(11), 39(5), 40(18), 43(16), 55(1), 56(2), 57(6), 62(12), 63(13), 64(10),	57(14), 59(22), 60(17), 62(9), 6(16), 9(18), 10(10), 27(1), 28(7), 29(1), 30(3), 31(13), 32(20), 33(19), 34(8), 35(5), 36(12), 37(4), 38(21), 39(2), 40(6), 56(15),	20(8), 22(5), 26(1), 27(7), 35(9), 36(6), 37(3), 40(4), 55(2),	9(16), 11(15), 12(14), 26(6), 27(10), 28(4), 29(5), 30(3), 31(7), 32(12), 40(17), 42(9), 43(13), 62(8), 64(11), 39(1), 35(2).
2.	High Backward Linkages	1(24), 2(11), 4(13), 5(31), 6(23), 7(15), 10(16), 14(4), 15(5), 16(6), 17(28), 18(19), 19(22), 20(12), 21(1), 22(9), 40(8), 41(26), 42(16), 45(3), 47(10), 48(29), 50(7), 52(14), 53(18), 54(2), 55(27), 61(30), 62(20), 64(25),	4(23), 10(2), 12(21), 14(4), 19(16), 20(18), 21(6), 22(10), 27(15), 28(24), 29(5), 30(13), 31(8), 32(14), 33(9), 34(7), 35(17), 36(12), 37(3), 38(27), 39(11), 40(1), 91(22), 44(36), 45(29), 50(28), 54(30), 59(25), 60(20), 62(19),	10(18), 14(6), 16(2), 18(14), 20(13), 21(10), 22(16), 26(1), 27(9), 36(7), 37(3), 40(4), 41(8), 43(17), 50(11), 53(12), 54(15), 55(5),	10(24), 11(19), 12(10), 13(26), 16(9), 17(14), 18(23), 19(16), 20(8), 21(28), 22(20), 25(25), 26(4), 27(15), 28(3), 29(17), 30(7), 31(2), 32(11), 35(1), 37(27), 39(6), 40(13), 42(5), 43(22), 47(18), 62(12), 64(21),
3.	High Backward & forward Linkages.	5, 6, 7, 22, 40, 55, 62, 64.	10, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 59, 60, 62.	20, 22, 26, 27, 36, 37, 40, 55.	11, 12, 26, 27, 28, 29, 30, 31, 32, 40, 42, 43, 62, 64, 39, 35.

Note—Numbers in Parenthesis indicate ranks, and free Numbers relate to the sector codes as in appendix table (1).