Indian Economic Review, Vol. XXV, No. 1

Alternative Estimates of Factor Intensity and Net Saving (Cost) of Factors : Some Results for Indian Economy

ARUN K. SENGUPTA

Economic Research Unit, Indian Statistical Institute, Calcutta

ABSTRACT

The orthodox measure of total factor intensity developed by Leontief assumes that all intermediate inputs are produced domestically. When some of the intermediate inputs are imported, Reidel (1975) has suggested a method of calculating total factor intensity which takes into account the factor requirements in producing goods which are exchanged for imported inputs. Using these two alternative methods, this paper obtains estimates of factor intensity for different producing sectors in India. The exercise carried out in this paper has shown that the importation of intermediate inputs as prevailed in the year 1979-80 in the Indian economy results in a net saving of capital and a net additional cost of labour.

INTRODUCTION

The orthodox measure of total factor intensity of a product as developed by Leontief indicates the factor intensity at the last stage of production of the commodity and of all the previous stages in the full circuit of the production process of the commodity. While doing so no distinction is made between the imported nput and the domestic inputs as regards the direct factor requirement calculation for the inputs. As a result the applicability of the total factor intensity so computed is required to be dependent on the validity of the implicit assumption that in respect of direct factor intensity imported intermediate inputs are equivalent to domestic inputs. Viewing this assumption as somewhat unrealistic, it has been suggested that if some of the intermediate goods are imported, the calculation of total factor intensity should

The author is grateful to Professor Sanjit Bose and Professor D. Dasgupta of the Economic Research Unit, Indian Statistical Institute, Calcutta for their valuable comments on the earlier draft of the paper.

take into account the factor requirements in producing the goods, which exchange for imported inputs, not the factor requirements which are required for imported inputs directly.

Based on the above notion of the total factor intensity, originally introduced by Riedel (1975), we have made an attempt in this paper for obtaining alternative estimates of factor intensity for different producing sectors in India. A comparison of the two sets of results obtained from the Orthodox measure and the measure being discussed now reveals the net factor cost or saving derived from the utilisation of the imported rather than domestically supplied intermediate goods. In section 2 of this paper the procedure for obtaining the alternative measures of factor intensity just referred to and also that for obtaining the net factor cost or saving from the utilisation of imported inputs are discussed. In Section 3, alternative estimates of factor intensities for the various sectors of Indian economy with a 14 sector breakdown have been obtained. The estimates of total labour intensities and total capital intensities so obtained for 14 sectors of India have been viewed as the factor intensities of the sectors in the existing structure of production when it is assumed that there is a zero trade balance and factor requirements for all direct and indirect imported input equivalents are reflected in the factor intensities of the production of required foreign exchange (export) for the imported inputs. It is interesting to observe that the estimates of net factor cost (saving) obtained for the different sectors in India based on the conditions prevailing in the year 1979-80 suggests that the pattern of intermediate imports embedded in the 1979-80 production structure generates an overall excess cost of labour and a net saving of capital compared to a production structure when all intermediate imports are supplied domestically. India being a LDC with abundance of labour and scarce capital, the above finding probably makes a strong case in favour of the present pattern of partial dependence on intermediate imports as opposed to complete self-reliance.

Section 2

Leontief measured the total (direct and indirect) labour and capital required to produce 1 Unit of commodity j by $L_j = \Sigma\, L_i\, a_{ij}$, $K_j = \Sigma\, K_i\, a_{ij}$ where l_i and K_i are the direct labour output and capital output ratios respectively, at the ith stage of production and a_{ij} are the elements of the inverted Leontief matrix $(I = A)^{-1}$. When $A = (aij)$, $aij = \frac{X_{ij}}{X_j}$, and $X_{ij} = X_{ij}(d) + X_{ij}(m)$. $X_{ij}(d)$ = value of domestic flow of ith sector input for the production of jth sector. $X_{ij}(m)$ = flow of imported ith sector input for the production of j th sector output. When the above Leontief measure of factor intensity is applied it implicity amounts to assume that $X_{ij}(m) = 0$ for all i, j. As in reality it is possible that $X_{ij}(m)$ assumes significantly

positive values for many combinations of i and j and as the pattern of factor requirements taking place abroad to produce imported inputs are unknown and even if known cannot be clubbed with the factor requirement for the domestic production components for obvious reasons, factor requirement calculation for the imported input component may be done as originally suggested by Riedel (1975) and applied for the Taiwan economy in the way as follows :

The total factor requirement for one unit of a product may be considered as the weighted sum of

(1) per unit Direct and Indirect requirement of labour and capital in producing domestic inputs and in the last stage of production.

(2) The labour and capital requirement to produce the direct and indirect input requirement to make available the export basket required to earn the foreign exchange with which to purchase the imported inputs required per unit of net output of the commodity.

The labour and capital required to produce one unit of exports is the average labour and capital requirements per unit output in each sector of the economy weighted by the distribution of the export basket for various sectors. If we have an Input-Output co-efficient matrix which reflects only the domestic supply of inputs per unit of output, then we may write the following :

$L_D^X = \sum_j \left(\sum_i l_i \, a_{ij}(d) \right). e_j = \Sigma \, l_j^x \, e_j =$ labour required to produce the direct and indirect input to produce one unit of export

and

$K_D^X = \sum_j \left(\sum_i k_i \, a_{ij}(d) \right) . e_j = \Sigma k_j^x \, e_j =$ capital required to produce the direct and indirect input to produce one unit of export

where $a_{ij}(d)$ are the elements of the Leontief Inverse $(I - A_D)^{-1}$, $A_D = (a_{ij}(d))$. Domestic Input-Output Matrix $e_j = \frac{E_j}{E}$ share of the jth sector in the export basket, E_j = value of export in the j th sector, E=aggregate value of the export basket. Again, it is possible that imported inputs are required to produce export goods let $M_j = \sum_j m_{ij}$ the total direct per unit imported intermediate input requirement for one unit of output of jth sector then $M_j^X = \Sigma_i \, a_{ij} \; (d)$ is the total (direct plus indirect) import requirement per unit of the net output of a commodity j. So we may write, the direct and indirect import requirement per unit of export as $M^X = \sum_j \left(\sum_j M_j \; a_{ij}(d) \right)$,

$ej = \Sigma M_j^x \; e_j$ Then production of one unit of export requires L_D^x units of labour and K_D^x units of capital in the processing of direct and indirect inputs and the final stage of production and we need $L_D^x . M^x$ and $K_D^x . M^x$ amounts of labour and capital to produce additional exports to exchange for the import which were employed in the original production of one unit of exports. Further, it is to be recognised that the additional exports in the first round require imported inputs again. Each round of additional exports, likewise, require imported inputs and consequently more exports and hence the employment of still more labour and capital and so on.

Hence, the aggregates of labour and capital requirement in all the rounds together in the production of one unit Foreign exchange are respectively,

$$L_D^X + L_D^x . M^x + L_D^x (M^x)^2 + L_D^x (M^x)^3 + \ldots + L_j^x (M^x)^x = \frac{L_D^X}{1 - M^x} \qquad (1)$$

and

$$K_D^x + K_D^x . M^x + K_D^x (M^x)^2 + K_D^x (M^x)^3 + \ldots + K_D^x (M^x)^x = \frac{K_D^x}{1 - M^x} \qquad (2)$$

since $0 \leqq M^x \leqq 1$

Thus, we obtain two components of total factor cost in an open economy.

(1) Labour and capital cost to produce the direct and indirect domestic

$$L_j^x = \sum_j 1_i \; \alpha_{ij}(d) - - (1A) : \text{Labour Cost.}$$

and

$$K_j^x = \sum_j K_i \; \alpha_{ij}(d) - - (1B) : \text{Capital Cost.}$$

(2) Labour and Capital cost involved in the production of additional export in all the rounds together to generate the foreign exchange for purchasing the imported inputs required directly and indirectly in the production of commodity j

$$M_j^x \left(\frac{L_D^x}{1 - M^x} \right) = \text{Labour Cost } (2A)$$

$$M_j^x \left(\frac{K_D^x}{1 - M^x} \right) = \text{Capital cost } (2B)$$

Sector	*Per unit Imported Input Requirement*	*Per unit Imported (Direct and Indirect) Input Requirement*	*Direct Labour Requirement per million Rs. of output*	*Direct a Require Rs. of estic inp*
	m_i	$\Sigma\ m_i\ a_{ij}\ (d)$	L_i (*Man years*)	L_j^x = (
	(1)	(2)	(3)	
1. Agriculture	.0154	.02740	170.0	
2. Forestry	0	.00840	170.0	
3. Fishing	0	.0077	170.0	
4. Mining	.00069	0.161	34.0	
5. Manufacture	.0745	0.1108	34.0	
6. Construction	.0171	.0577	60.0	
7. Electricity	.00179	.0208	18.0	
8. Railways	.0227	.0234	82.0	
9. Other Transport	.0628	.0916	89.0	
10. Communication	0	.0064	91.0	
11. Trade and Storage	.0004	.0699	65.0	
12. Banking	0	.0112	31.0	
13. Real Estate	0	.0109	0.0	
14. Public Administration	.0102	.0463	69.0	

a_{ij} (

TABLE 1

ESTIMATES OF FACTOR INTENSITIES

t Labour rement illion Rs. tput *an years)*	*Direct and Indirect Labour Requirement per million of Rs. of output for the domestic input only* $L_j^x = \Sigma L_i\ a_{ij}\ (d)$ *(Man years)*	*Direct Capital Requirement per Million Rs. of output for the domestic input only* K_i *(Million Rupees)*	*Direct and Indirect Capital Requirement for the domestic input only* $K_j^x = \Sigma\ K_i\ a_{ij}(d)$ *(Million Rupees)*	*Sectoral Share of total exports* e_j	*Secto Share total outp* Q_j
(3)	(4)	(5)	(6)	(7)	(8
170.0	208.2	3.61	5.11	.0812	.0
70.0	185.4	0.97	1.94	.0190	.0
70.0	190.8	8.83	9.80	.0002	.0
34.0	66.8	4.83	7.97	.203	.0
34.0	109.8	4.29	8.99	.6843	.3
60.0	126.6	0.20	4.61	0	.0
18.0	57.9	26.00	36.49	0	.0
82.0	120.3	6.16	9.16	.0148	.0
89.0	131.7	8.27	11.09	.0199	.0
91.0	100.0	6.41	71.8	0	.0
65.0	120.5	1.20	6.72	.0888	.1
31.0	67.9	0.05	1.82	.0014	.0
0.0	24.5	5.46	6.37	0	.0
69.0	156.0	1.30	5.19	.0772	.1

$a_{ij}\ (d)$ = $(i,j$th element of $(I - A_D)^{-1}$

A_D = Domestic Input Coeff. Matrix, M

K

TABLE 1

'OR INTENSITIES AND NET FACTOR COST (SAVING)

					Existing Structure of Production	
' c	Sectoral Share of total exports e_j	Sectoral Share of total output Q_j	$L_j^x . e_j$	$K_j^x . e_j$	Total labour requirement under existing structure of production per Million Rs. of output $L_j^* = L_j^x(d) + M_j^x \frac{L_D^x}{1-M^x}$ (Man years)	Total capital requirement under existing structure of production per Million Rs. of output $K_j^* = K_j^x(x) + M_j^x . \frac{K_D^x}{1-M^x}$ (Million Rupees)	To lab ass du dir do
	(7)	(8)	(9)	(10)	(11)	(12)	
	.0812	.02315	16.19	.4149	211.9	7.58	
	.0190	.0075	3.1518	.0329	186.53	2.69	
	.0002	.0050	.0381	.00196	191.05	10.51	
	.203	.0110	1.3519	.1617	68.77	9.42	
	.6843	.3326	75.13	6.15	124.73	18.98	
	0	.0891	0	0	134.39	9.81	
	0	.0203	0	0	60.7	38.36	
	.0148	.0106	1.7804	.1420	123.45	11.27	
	.0199	.0419	2.6208	.2206	144.06	19.35	
	0	.0046	0	0	100.86	7.75	
	.0888	.1077	10.70	.5967	129.48	13.02	
	.0014	.0176	.0950	.0025	97.33	2.83	
	0	.0193	0	0	25.97	7.35	
	.0772	.1076	11.10	.3695	162.25	9.36	

Coeff. Matrix, $M^x = \sum (\sum m_i a_{ij} (d))\ e_j, L_D^x = \sum_j (\sum_i L_i a_{ij} (d)) e_j = \sum_j L_j^x e_j$

$$K_D^x = \sum_j (\sum_i L_i\ a_{ij} (d)) e_j = \sum_j K_j^x e_j$$

f Production		*Assumed Seructure of Production*		*Resource Cost (Saving) from utilisationo f importde inputs per million Rupees ofoutput*	
il requirement g structure of :r Million Rs. $)+M_j^x.\ \frac{K_D^z}{1-M^x}$ *on Rupees)*	*Total Direct and Indirect labour requirement under assumed structure of production when all intermediate inputs are supplied domestically* $L_j = \Sigma\ L_i\ a_{ij}$ *(Man years)*	*Total (Direct plus Indirect) Capital requirement under assumed structure of production when all intermediate inputs are supplied domestically* $K_j = \Sigma\ K_i\ a_{ij}$ *(Million Rupees)*	*Net labour Cost (Saving)* $L_j^* - L_j$ *Man years)*	*Net Capital Cost (Saving)* $K_j^* - K_j$ *(Million Rs)*	
12)	(13)	(14)	(15)	(16)	
.58	211.0	5.34	+ .9	+2.24	
69	188.2	2.03	— 1.67	+ .66	
.51	191.2	9.84	— .15	+ .67	
.42	68.0	8.03	+ .77	+1.39	
98	168.0	11.24	—43.27	+7.74	
.81	127.0	5.00	+ 7.39	+4.81	
.36	60.0	36.71	+ .7	+1.65	
.27	124.0	9.49	— .55	—1.78	
.35	147.0	12.2	— 2.94	+7.15	
'.75	100.3	7.19	+ .53	+ .56	
.02	97.5	3.59	+32.43	+9.43	
;.83	67.5	1.93	+29.73	+ .90	
'.35	16.3	6.11	+ 9.67	+1.24	
9.36	219.3	11.94	—57.05	—2.58	

Hence total factor intensity now equals —

$$L_j^* = L_j^x + M_j^x \left(\frac{L_D^x}{1 - M^x} \right) : \text{Labour intensity } (3A)$$

$$K_j^* = k_j^x + M_j^x \left(\frac{K_D^x}{1 - M^x} \right) : \text{Capital intensity } (3B)$$

The second component of the total factor cost as indicated above suggests that the factor intensity of a given production activity in an open economy is dependent not only upon technology of domestic production but also upon the structure of foreign trade. As suggested by Hechsher-Ohlin theorem, labour abundant L.D.Cs' composition of foreign trade tends to be such that 1 unit of export requires relatively more labour than that of import substituting good and 1 unit of import substituting goods requires relatively more capital than that of export.

Estimates of factor intensity in the production activity of various commodities by the above method when compared with those based on the orthodox measure of total factor intensity, as developed by Leontief reveals the net factor cost or saving derived from the utilisation of imported rather than domestically supplied intermediate goods. So if we find that $L_j < L_j^*$ and $K_j > K_j$, it will mean that importation of intermediate inputs (i.e. the implicit substitution of exports for otherwise domestically supplied inputs) results in the lessening of overall capital requirement in the economy, but entails a greater demand for labour than would be the case if all intermediate inputs were supplied domestically. The total factor intensity of production in an open economy when estimated in the way just mentioned is likely to be sensitive to any change in the composition of exports.

Section 3

Data Base of the Exercise

The Sixth plan Technical Note (henceforth SPTN) published by PPD, Planning Commission, Govt. of India, besides containing two 89 × 89 transaction flow matrices one for 1979-80 and the other for 1984-85, contains two 14 × 14 tables condensed from the 89 × 89 tables for the same two years. Each cell of the matrices contain domestic flows of $(x_{ij}(D))$ and imported inputs $(x_{ij}(m))$ clubbed together. However SPTN provides two additional 14 × 14 matrices which reflect transaction of imported inputs $(x_{ij}(m))$ only. So, we obtain $X_{ij}(T) - X_{ij}(M) = x_{ij}(d)$ for all the cells. In the above fashion we obtained the 14 × 14 $(X_{ij}(d))$ matrix for 1979-80. As the 14 Sector output vector for 1979-80, is also provided in the SPTN,

we could easily obtain A_D matrix by computing $X_D\ \hat{X}^{-1}$, where X_D is the $(X_{ij}(d))$ matrix and $\hat{X}$ is a diagonal matrix with output as the diagonal elements. Now, from the Import transaction matrix itself, we could obtain the direct total imported input coefficients for all of our 14 sectors by just adding the elements of each column and dividing by the corresponding output levels. SPTN provides informations in respect of sectoral employment and output levels for the years 1979-80 in million standard person years and Rs Million respectively. These have been used to compute the labour requirements per million Rs output (direct labour intensities). Table 6.2 of SPTN provides incremental employment capital ratios for the same sectors. Assuming average and marginal employment capital ratios being same and using the identity $\frac{K}{0} = \frac{N}{0} \cdot \frac{K}{N}$, where K=capital,0= output and N = employment, we have obtained the capital requirements Rupees Million per Rs Million of output.

Section 4

Results

The table 1 presents the main empirical results of the exercise. The column 1 shows the direct total import requirement of each sector. The supply of direct import from various sectors to each sector have been clubbed and are shown in column 1. The sectors 'Manufacture' and 'other Transport' are found to have the highest import contents. For Manufacture it is as high as 7.45 percent. The sector 'other Transport' follows with 6.24 percent import content. Column 2 presents import requirement for the direct and indirect domestic input for each sector. Again we see that the same two sectors Manufacture and 'other Transport' emerge as the two most import dependant sectors. Column 3 and column 5 depicts the direct labour and capital requirement respectively for the domestic input of each sector. The leading labour intensive sectors are 'Agriculture' and 'Allied Sectors'. The most capital intensive sector is the sector 'Power'. Column 4 and 6 reflect the direct and indirect labour requirement and capital requirement respectively for each sector for domestic inputs only. Power emerges as the most capital intensive sectors again. The column 9 and 10 show the total labour and capital requirement in each sector for the direct and indirect domestic input to produce average 1 unit of export.

The columns 11 and 12 depict the total labour and capital requirement under existing structure of production when the pattern of intermediate importation prevailing in 1979-80 exists and the factor requirement for the export basket to earn the foreign exchange to pay for imported inputs is taken into account along with factor requirement for the direct and indirect

domestic input for the calculation of total factor intensity. In the columns 13 and 14 the total direct and indirect labour requirements and the total direct and indirect capital requirements respectively are shown when the structure of production is assumed to be based on zero intermediate imported input. The usual measure of total factor intensity is generally based on this latter notion of factor requirement.

Now, we may compare the result shown in column 11 with those of column 13 and the results in column 12 with those of column 14. These comparisons reveal the net resource cost (saving) from utilisation of imported inputs. As all our results contain essentially implication of the interdependence of various sectors in the economy, there is not much sense in trying to obtain any inference from the magnitude and sign of the net labour cost or saving for any sector in isolation. However, the average computed from the net factor costs (saving) shown sectorwise in columns 15 and 16 weighted by the distribution of gross output over all the sectors in the economy suggests that the utilisation of imported inputs in the Indian economy on the average entailed a net saving of Rs. 4.5029 million of capital and an additional cost of labour and 25 man-years per million Rs. output. On the average the trade-off of 1979 export basket containing some primary commodities and some manufactured goods for imports of intermediate inputs resulted in a net saving of capital and an excess cost of labour in the economy. In the sector 'Manufacture' due to importation of intermediate inputs 43.27 man-years of additional labour and capital saving of Rs. 7.24 million took place per million Rs output. On the other hand in the sector 'Trade and Services' due to importation of intermediate inputs, saving both in capital and labour took place. Already it has been mentioned that the alternative measure of factor intensity in the existing structure of production used here for the open economy is highly sensitive to the structure of exports. So, the guideline obtained from the exercise for determining whether to keep on depending intermediate import may have limited applicability when the prevailing export pattern is not the optimal export pattern from the comparative advantage considerations. In such cases, the optimal solution may not be just (or at all) the substitution of domestic inputs for imports or viceversa (though it might result in an improvement) but rather a restructuring of exports towards more labour intensive commodities. The usefulness of the results obtained seem to have further limitation as in the exercise 'Manufacture' is a highly aggregated sector. To have more useful results it is necessary that in some of the sectors particularly in 'Manufacturing', the commodities which have substantial direct import content be treated as separate sectors in the calculation of net resource cost (Saving).

The entire quantity of imported inputs is assumed competitive and this is no doubt a drastic simplification. If sizable imported input is

noncompetitive and if input substitution is ruled out, we cannot think of any structure of production when all inputs are supplied domestically.

Finally, while interpreting the results we must keep in mind that in the presence of distorted domestic market, the calculation of trade-off between use of domestic inputs and imported inputs requires to be based on some sort of shadow prices for valuation of inputs and outputs.

REFERENCES

W. Leontief, Studies in the Structure of American Economy (Oxford University Press), 1953.

A. Ghosh, Experiments with Input-Output Models (Cambridge University Press), 1960.

James Riedel, Factor Proportion, Linkages and the Open Developing Economy, Review of Economics and Statistics (1975).

Perspective Planning Division : Planning Commission, Govt. of India, A Technical Note to the Sixth Plan of India.

APPENDIX TABLE 1

LEONTIEF INVERSE OF THE INPUT COEFFICIENT MATRIX OF INDIA (1979-80)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Agri-culture	*Fore-stry*	*Fish-ing*	*Mining*	*Manu-facture*	*Const-ruction*	*Elect-ricity*	*Rail-ways*	*Other Trans-port*	*Commu-nication*	*Trade & Storage*	*Banking ing*	*Real-estate*	*Public Admini nis.*
1. Agriculture	1.1600	.0105	.0143	.0274	.1960	.0680	.0298	.0420	.0850	.0082	.0180	.0210	.0085	.0940
2. Forestry	.0009	1.010	.0005	.0009	.0067	.0220	.0011	.0034	.0020	.0003	.0005	.0007	.0026	.0026
3. Fishing	.0003	.00016	1.0000	.0005	.0029	.00103	.0005	.0006	.0010	.0001	.00034	.00047	.00013	.0023
4. Mining	.0106	.0055	.0058	1.0300	.0990	.0530	.1320	.0606	.0330	.0046	.0098	.0088	.0066	.0034
5. Manufacture	.1460	.0630	.0740	.1660	1.4600	.4870	.1990	.3060	.4570	.0560	.0980	.0990	.0600	.4010
6. Construction	.0162	.0298	.0103	.0150	.0430	1.0200	.0150	.1120	.0190	.0065	.0083	.0180	.1210	.0520
7. Electricity	.0095	.0047	.0085	.0640	.0500	.0350	1.3200	.0370	.0280	.0066	.0320	.0198	.0049	.0660
8. Railways	.0029	.0135	.0021	.0083	.1370	.0150	.0300	1.0200	.0080	.0090	.0128	.0066	.0024	.0147
9. Other Transport	.0126	.0504	.0134	.0234	.0579	.0880	.0469	.0333	1.0400	.0261	.0685	.0287	.0108	.6888
10. Communi-cation	.0011	.0008	.00156	.00221	.0039	.0053	.0022	.00215	.00636	1.0000	.0154	.0169	.0007	.0128
11. Trade and Storage	.0581	.0365	.0803	.1080	.2090	.3330	.0906	.1050	.1840	.0241	1.1100	.1290	.0417	.6390
12. Banking	.0142	.0038	.0055	.0172	.0395	.0324	.0362	.0147	.0309	.0025	.0403	1.0109	.0048	.0410
13. Realestate	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	.0000	1.0000	.0000
14. Public Adminis	.0204	.0337	.1210	.1430	.6520	.0	.0705	.0304	.1020	.0077	.1100	.2090	.0103	1.1300

APPENDIX TABLE 2

LEONTIEF INVERSE OF THE DOMESTIC
(NET OF IMPORT)
INPUT COEFFICIENT MATRIX OF INDIA (1979-80)

	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	(11)	(12)	(13)	(14)
	Agri-culture	*Fore-stry*	*Fish-ing*	*Mining*	*Manu-facture*	*Cons-truction tion*	*Electri-city*	*Rail-ways*	*Other Trans-port*	*Commu-nica-tion*	*Trade & Storage*	*Bank-ing*	*Real-estate*	*Public Admi-nis.*
1. Agriculture	1.1550	.00706	.00909	.02069	.18012	.05802	.02363	.03492	.04377	.00662	.01110	.01164	.01116	.04786
2. Forestry	.00073	1.0008	.00047	.00088	.00605	.02170	.00097	.00319	.00153	.00032	.00047	.000068	.00409	.00238
3. Fishing	.00024	.00005	1.0023	.00048	.00269	.00091	.00044	.00054	.00075	.00011	.00030	.00049	.00018	.00217
4. Mining	.00326	.00259	.00248	1.0299	.03255	.01891	.12344	.04469	.01899	.00219	.00568	.00426	.00369	.01552
5. Manufacture	.11311	.05441	.06982	.15565	1.3832	.44558	.18149	.26813	.33620	.05821	.85274	.08946	.08573	.36754
6. Construction	.01518	.02993	.01044	.01472	.04027	1.0158	.01424	.11024	.01285	.00654	.00773	.01722	.19123	.05019
7. Electricity	.00817	.00398	.00821	.06389	.04511	.03119	1.3166	.03474	.01681	.00637	.03056	.01911	.00664	.00643
8. Railways	.00245	.01329	.00203	.00813	.01240	.01448	.02967	1.0177	.00513	.00898	.01248	.00676	.00339	.01401
9. Other Transport	.01124	.04975	.01359	.02302	.05403	.08607	.04617	.03148	1.0326	.02575	.06754	.02826	.01653	.08712
10. Communi-cation	.00331	.00174	.00301	.00534	.03225	.01413	.00578	.00743	.00977	1.0014	.01686	.01841	.00275	.02005
11. Trade & Storage	.05313	.03464	.08224	.10602	.19266	.32351	.08793	.10160	.16034	.02318	1.0924	.12684	.06308	.62997
12. Banking	.01354	.00353	.00656	.01759	.04019	.03157	.03626	.01415	.02535	.00246	.03980	1.0932	.00685	.04025
13. Real Estate	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	000000	1.0000	000000
14. Public Adm.	.01854	.03235	.12654	.14276	.05457	.04977	.06957	.02719	.09179	.00745	.10852	.20767	.01297	1.1304