Price-Change Calculations based on Three Forms of the Input-Output Model: An Illustration from Estimates of the Impact of Equal Pay on Irish Industry

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THE official Input-Output (I-O) Tables for 1964 provide us with a 17 sector model in Appendix Tables A1, A2 and A3 of [1]. In this version of the model, similar imports are distributed along the rows of the transactions matrix together with domestically produced commodities and the two flows may not be identified separately. There is, however, an aggregate subtraction of a similar import vector from the total flow aggregate vector, to yield the aggregate domestic output vector. We shall refer to this as Version 1 of the basic I-O model.

A Second Version of this 17 sector model is published (Transactions Table and I-A Inverse) as Appendix to this Note. In this version, similar imports are aggregated into several extra rows of Primary Inputs, leaving only domestic flows along the rows of the transaction matrix. Thus the primary input total for each column is larger than that for Version 1. The 12 rows of similar imports transactions values and their direct input coefficients may be derived by subtracting the first 12 rows of the Transactions Matrix and Direct Input coefficients matrix of Version 2 from the corresponding rows of the corresponding matrix of Version 1. (Only the 12 sectors producing goods are involved, since there are no imports in the 5 service sectors.)

A Third Version of the Input-Output model is similar to Version 2 except an Export Column (and/or other final demand columns) is superimposed on the inter-industry matrix. The purpose of this treatment is to allow explicit assumptions to be made about the (exogenous) behaviour of export prices, thus forcing the residual effects of changes in the costs of primary inputs to be borne by the domestic market. We shall refer to this as Version 3 of the basic I-O model. The tables of this version have been published (for 1964, 17 sectors) in [2].

The purpose of this Note is (*a*) to present an explicit comparison of the assumptions behind each of the three forms of I-O models outlined above and (*b*) to illustrate the application of I-O models to the calculations of price changes on the basis of some data concerning the costs of equal pay (women with men) in Irish manufacturing industry.

Formal Description of the Models

Let n = number of productive sectors in the I-O transactions matrix (in all cases considered here, $n = 17$).

X = a column vector, $(n, 1)$ of the values (producers' prices) of total domestic outputs of the productive sectors. (Each element, X_i, of X excludes the value of competitive imports of the i^{th} product.)

M = a column vector, $(n, 1)$ of similar imports, whose elements M_i are the values of imports similar to the product of the i^{th} domestic sector. Non-zero entries possible for commodities only, (all service sectors have zero entries).

Y_d = a column vector, $(n, 1)$ whose elements, Y^d_i, are the total final demand for the domestic production of the i^{th} sector.

Y_m = a column vector $(n, 1)$ whose elements, Y^m_i, are the total final demand for similar imports of the i^{th} sector.

X_{ij} = value of domestic output of sector i which is input to sector j.

M_{ij} = value of similar import i which is input to productive sector j.

a^d_{ij} = X_{ij}/X_j, the direct input coefficient for domestic output of category i purchased as input by productive sector j.

A_d = square matrix (n, n) of a^d_{ij} coefficients (the inter-industry matrix of direct input coefficients for domestic flows).

A_m = square matrix (n, n) having as entries the a^m_{ij} coefficients which are direct inter-industry coefficients for similar import flows. For the 1964 17 sector model discussed below, rows 13 to 17 inclusive (the service sectors) have zero entries. $a^m_{ij} = M_{ij}/X_j$

I = the unit matrix (n, n) having unity in the main diagonal, zero elsewhere.

Version 1 may be written

(1.1) $X_i = \sum_{j=1}^{n} (X_{ij} + M_{ij}) + (Y^d_i + Y^m_i) - M_i \quad i = 1, \ldots n$ rows

(1.2) $X = (A_d + A_m) X + (Y_d + Y_m) - M$

(1.3) $(I - A_d - A_m) X = Y_d + Y_m - M$

(1.4) $X = (I - A_d - A_m)^{-1} [Y_d + Y_m - M]$

In this variant, the salient assumption is that £1 worth of similar imports substitutes perfectly for £1 worth of domestic commodities and thus the *sum* $a^d_{ij} + a^m_{ij}$

is invariant regardless of how it is decomposed between a_{ij}^d and a_{ij}^m. Taking $(I - A_d - A_m)^{-1}$ as invariant, one can obtain the levels of gross sectoral output and primary inputs required by alternative values of the final demand vector. It must be underlined that the X generated by application of $[I - A_d - A_m]^{-1}$ to a final demand vector without subtraction of some M vector will be too large (if there are any similar imports in the structure), as also will be the vector of primary inputs derived from that procedure; this Variant assumes that the similar import coefficients a_{ij}^m generate direct and indirect requirements in the same way as the domestic coefficients, a_{ij}^d, which is clearly not the case, hence the need to correct the level of final demand by a subtraction of an M vector.

Version 2 may be written

(2.1) $X_i = \sum_{j=1}^{n} X_{ij} + Y_i^d \quad i = 1, \ldots n$, rows

(2.2) $X = A_d X + Y_d$

(2.3) $(I - A_d)X = Y_d$

(2.4) $X = (I - A_d)^{-1} Y_d$

Taking $(I - A_d)^{-1}$ as invariant and choosing values of the Y_d vector, one may obtain the required levels of X. The required levels of similar and complementary imports can be obtained as part of the required primary input vector, in the usual manner. Here there is no question of overestimating X for any level of Y_d chosen, since domestic flows only are reflected in the $(I - A_d)^{-1}$ matrix. There is however no flexibility in the sense that similar import levels are determined via the X vector required by any Y_d and the particular breakdown between a_{ij}^d and a_{ij}^m which occurred in the original direct input coefficient matrix is frozen into all calculations based on this version.

In connection with Versions 1 and 2 it should be noted:

(a) that the primary input flows to final demand (the bottom right hand corner of the transactions table) are outside the scope of these models, which are concerned only with the first n rows of the final demand column(s). Thus, these exogeneous flows from primary input direct to final demand need to be added to the results obtained before one has a complete picture of the economic structure.

(b) the primary input aggregate generated by the model is equal to the sum of the elements of $Y_d + Y_m - M$ (Version 1) or of Y_d (Version 2), the definition of "primary" depending on the version used. Version 2 treats similar imports as primary inputs, whereas in Version 1 similar imports are included in the $(I - A_d - A_m)^{-1}$ matrix and as vector M deducted from the final demand vector $Y_d + Y_m$. The equality of final demand and primary input is preserved because each solution to a model may be used to fill out a transactions table; deductions of the inter-industry flows leaves aggregate primary input equal to aggregate final demand (reduced by M, when relevant).

For Version 3 the following additional notation is required:

E_i = exports of domestic productive sector i

e_i obtained from $E_i = e_i X_i$: at original price levels, for each £1 worth of output i, £e_i is exported.

(3.1) $X_i = \sum_{j=1}^{n} X_{ij} + e_i X_i + Y_i^d - E_i$

(3.2) $X = A_d X + eX + Y_d - E$

(3.3) $(I - A_d - e)X = Y_d - E$

(3.4) $X = (I - A_d - e)^{-1}(Y_d - E)$

This Version is essentially the same as Version 2, with the additional feature that an export column is superimposed on the inter-industry matrix. This introduces flexibility in the exercises concerning price-change calculations discussed below, but necessitates the assumption that invariant proportions of sectoral gross output are exported. The 17 sector $(I - A_d - e)^{-1}$ matrix for 1964 has been published in [2], Table 2.

Price-Change Calculations

The I-O models discussed above can be usefully applied to the calculation of the sectoral price changes implied by (exogenous) changes in the cost of primary inputs (that is, changes in wage costs, import prices, indirect taxes, etc.). The physical inputs per unit physical output are assumed to remain unchanged, but the cost per unit output varies as a consequence of the changing cost of the primary inputs—the reactions to which eventually result in a new equilibrium at a new price level for final output which can be expressed in the form of price indices based on unity for the original price structure.

Let π_{ij}^o = primary direct input coefficient of type i for productive sector j,
$i = 1, 2, \ldots k$ for k primary input rows
$j = 1, 2 \ldots n$ productive sector.
Superscript o refers to original I-O table.

$\pi_j^o = \sum_{i=1}^{k} \pi_{ij}^o$ = total primary input coefficient for sector j.

π_{ij}^1 = new primary direct input coefficient, after application of price change to π_{ij}^o, and before any further adjustment.

P^1 = a row vector, $(1, n)$, whose elements, p_i, are the new price indices for the n productive sectors, based on unity for the original I-O table.

At original prices, the direct input coefficients in each of the n columns must add to unity; for Version 2:

(2.5) $\sum_{i=1}^{n} a_{ij}^{d} + \sum_{i=1}^{k} \pi_{ij}^{o} = 1$, or in matrix notation for the n columns.

(2.6) $(1, 1, \ldots 1)A_d + (\pi_1^o, \pi_2^o, \ldots \pi_n^o) = (1, 1, \ldots 1)$ where the unit elements in the row vectors can be interpreted as unit price levels.

After a change in the unit cost of a primary input, the physical amount originally purchased for £a_{ij}^{d} at old prices required to give physical output of productive sector j valued at £1 at old prices, now costs $P_i\, a_{ij}^{d}$ to give an output valued at P_j thus:

(2.7) $(P_1, P_2 \ldots P_n)\, A_d + (\pi_1^1, \pi_2^1, \ldots \pi_n^1) = (P_1, P_2, \ldots P_n)$ this yields

(2.8) $(P_1, P_2, \ldots P_n)\,(I - A_d) = (\pi_1^1, \pi_2^1, \ldots \pi_n^1)$

(2.9) $(P_1, P_2, \ldots P_n) = (\pi_1^1, \pi_2^1, \ldots \pi_n^1)\, [I - A_d]^{-1}$

Thus the vector of new prices can be calculated by post-multiplying the vector of total primary input coefficients by the $[I - A_d]^{-1}$ matrix. It is clear that A_d should be used in exercises of this type, as opposed to $A_d + A_m$, since changes in A_m are assumed to be exogenous and the values for a_{ij}^{d} and a_{ij}^{m} will not be in the same proportion after the change in input costs as they were before. Thus the use of Version 1 of the I-O model outlined above is inappropriate in the calculation of price changes.

The new direct input coefficients to replace the old a_{ij}^{d} are given by a_{ij}^{d} new $= P_i\, a_{ij}^{d}/P_j$ and for the new π_{ij}

$$\pi_{ij} \text{ new} = \pi_{ij}^{1}/P_j$$

These new coefficients will add to unity in each column, as may be seen from application of (2.7). The results of (2.9) may readily be expressed in terms of (percentage) price changes and (percentage) changes in the vector π.

The use of Version 3 of the I-O to calculate price changes has been illustrated in [2]. Version 1 is not suited to price-change calculations, as stressed earlier, due to its treatment of similar imports as if they were equivalent (in terms of inter-industry repercussions) to domestic commodity flows; this is clearly implied above in our reference to the over-estimation of primary inputs resultant from the application of $[I - A_d - A_m]^{-1}$ to a final demand sector. The choice between Versions 2 and 3 of the model depends on the desired assumption concerning the behaviour of export prices; in Version 3, the level of sectoral price changes in the export market are specified exogenous, and the residual effects of the changes in primary input costs are forced onto the remainder of the market—that is, domestic sales. In Version 2 on the other hand no distinction is made between types of final demand as far as the price consequences of changes in the cost of primary inputs are concerned. Clearly, it is a matter for judgement which version is appropriate to the task in hand. In [2] price changes were calculated (as a result of a specified vector of percentage increases in primary input costs) on the assumption that export markets would bear a four per cent price rise, domestic output absorbing the remainder of the impact of the rise in primary input costs.

The Cost of Equal Pay

The question of removing the differential between male and female wage rates in similar occupations has been brought to the forefront of many discussions of the position of women in industrial societies. Naturally, the implications of equal pay in this sense for industry costs and price levels need to be explored. An attempt has been made to evaluate these implications for Irish manufacturing industry in [3]. This exercise is a convenient illustration of an application of the I-O models discussed above to measuring the impact of an increase in the cost of a primary input on the sectoral price level. It is notable that efforts to evaluate the impact of equal pay in other countries have not recognised the inter-industry repercussions of implementing the policy [4].

For the purpose of the present Note, only the outline of the assumptions used to try to evaluate the cost of equal pay need be presented. For each of the 45 sectors described in the Census of Industrial Production, 1967, the adult female wage bill (in a pay week in October) as a percentage of the total wage bill (in a pay week in October) was calculated. It was then assumed (in the absence of really plausible alternatives, and on the basis of very limited wage rate data for occupations in which both male and female rates exist) that equal pay would involve increasing the adult female wage bill by 54 per cent. The annual salary bill for each industry was distributed between males and females on the assumption that the average salaried female earned £575 per annum in 1967. Equal pay was assumed to raise the female salary bill by 22 per cent. The calculation was concerned exclusively with the *partial*, short-term impact of equal pay, and therefore no allowance was made for the impact of this policy on employment levels, on the sex ratio of employment, or on the level of male wages. No attempt has been made to explore the even remoter repercussions, such as the effect on the level (and composition) of aggregate demand or exports. The calculations also exclude the impact of increases in the cost of labour input to non-manufacturing productive sectors upon the price of manufacturing output, and in as much as industries use the services of national and local government, for example, this could be considerable.

The resultant increase in wage and salary costs have been aggregated into the 10 relevant productive sectors of the 17 sector I-O table (agriculture, mining excluded for obvious reasons) and these expressed as a fraction of the value of gross output in each sector. The vector of cost increases thus obtained can be written $(\pi_1^1 - \pi_1^0, \pi_2^1 - \pi_2^0, \ldots, \pi_n^1 - \pi_n^0)$ $n = 10$ (manufacturing industries) and post multiplying this by $[I - A_d]^{-1}$ yields the unit price *increases* $(P_1 - 1, P_2 - 1, \ldots P_n - 1)$, in accordance with the procedure outlined in equation (2.9).

It should be recalled that π^0_j and π^1_j consist of the sum over the k factors of the primary input coefficients (*viz.* $\pi^0_j = \sum_{i=1}^{k} \pi^0_{ij}$), but that in our own case only the cost of the labour impact is assumed to change: that is $\pi^0_{ij} = \pi^1_{ij}$ for all i except labour ($j = 1, \ldots n$ sectors).

Thus it is explicitly assumed that no other primary input increases in cost as a result of equal pay, and this assumption is especially unrealistic in the case of imports and profits. The model could be easily altered to reflect more plausible assumptions as to the effect of equal pay on the profit level or the price of imports.

The $(\pi^1_1 - \pi^0_1, \pi^1_2 - \pi^0_2, \ldots \pi^1_n - \pi^0_n)$ vector obtained from the assumption concerning equal pay outlined above is recorded in Table 1. This table also records the $(P_1 - 1, P_2 - 1, \ldots P_n - 1)$ vector that results from post multiplication by $(I - A_d)^{-1}$ (Version 2), $(I - A_d - e)^{-1}$ (Version 3) and $(I - A_d - A_m)^{-1}$ (Version 1). The results from the Version 1 calculations are, as has been emphasised above, not strictly meaningful in the present context and are included here only for the purposes of assessing the importance of using the $(I - A_d)^{-1}$ or the $(I - A_d - e)^{-1}$ in I-O exercises connected with price-change calculations. In the Version 3 exercise it has been assumed that export price levels do not change and hence that home markets have to bear the entire brunt of the cost of equal pay, an assumption that provides something like an upper limit to the level of domestic price rises, and that could be readily modified.

Two points emerge from an examination of Table 1. In the first place, regardless of which Version is applied the rank of the industries (by the size of the impact of equal pay) is the same in all cases. (In fact, this ranking is the same as that obtained by using the increase in unit labour costs as the ranking criterion). Secondly, as would be expected from the nature of the models, Version 2 predicts a lower price increase in each sector than does Version 1 or Version 3; but nothing can be said about the relationship between Version 1 and Version 3. It should be recalled, however, that the inclusion of Version 1 in this illustration is merely to underline the importance of obtaining the second and third versions of the I-O model for the purpose of price-change calculations.

It is clear from Table 1 that the estimated total (primary *plus* secondary) impact of equal pay on the price level will considerably exceed the estimated primary (labour input) cost increases. This is seen, for example, in the case of Food, where the estimated rise in unit labour costs is 0·0077, but the estimated rise in the sectoral price level is 0·0107 (Version 2) or 0·0172 (Version 3). Thus ignoring the inter-industry repercussions leads to at least a 30 per cent underestimate of the impact of equal pay on the sectoral price level. We may therefore conclude that the indirect effects should be taken into account when the definite calculations of the cost of equal pay are being made.

Conclusion

The methodological points outlined here are of general interest to research applying I-O techniques to the task of predicting sectoral price change. The data on the costs of equal pay provide a convenient illustration of the results obtained from the various versions of the basic I-O model.

TABLE 1: *Illustration of the Impact of the Estimated Costs of Equal Pay on Sectoral Price Levels*

Sector	*Estimated Increase in Labour Costs (Per Unit Gross Output)*	*I-O Model Version**		
		(1)	(2)	(3)
Food	·0077	·0120	·0107	·0172
Drink/Tobacco	·0127	·0159	·0151	·0204
Textiles (excl. Hosiery)	·0245	·0392	·0304	·0433
Hosiery/Clothing/Shoes/ Leather	·0555	·0785	·0669	·1017
Wood/Furniture	·0084	·0160	·0111	·0140
Paper/Printing	·0226	·0340	·0273	·0344
Chemicals	·0080	·0126	·0105	·0123
Clay/Glass/Cement	·0073	·0097	·0088	·0109
Metals/Engineering/Vehicles	·0088	·0112	·0104	·0134
Other Manufactures	·0085	·0103	·0095	·0118

*See text for details of the assumptions embodied in each version.

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REFERENCES

[1] *Input-Output Tables for* 1964, Central Statistics Office, Dublin, 1970.

[2] R. C. Geary, E. W. Henry and J. L. Pratschke, "The Recent Price Trend in Ireland", *Economic and Social Review*, Vol. 1, No. 3, April 1970.

[3] B. M. Walsh, "Estimating the Costs of Equal Pay in Irish Industry", Economic and Social Research Institute, Memorandum Series, No. 71.

[4] Department of Employment and Productivity, *Gazette*, "The Costs of Equal Pay", January 1970.

APPENDIX: *Version 2 Transactions Matric*

1964 17-Sector at Producers Prices. All Competitive Imports treated as Primary — £000 Producers' Prices	Agriculture, Forestry, Fishing	Mining, Peat	Food	Drink, Tobacco	Textiles, except Hosiery	Clothing, Hosiery, Shoes, Leather	Wood, Furniture	Paper, Printing	Chemicals	Clay, Glass, Cement	Metal, Engineering, Vehicles	Other Manufactures	New, Repair, Construction	Electricity, Gas, Water	Services except Government	Government Services except Post Office	Artificial Sectors NES	Sector	TOTAL INTER
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17		
1. Agriculture, Forestry, Fishing	74,672		119,865	1,841	1,171	—1,199	535									1,119		(1)	198,004
2. Mining, Peat	887	123	597	208	17	36	13	96	35	804	124	21	6,001	2,328	28	859		(2)	12,177
3. Food	22,074		38,540	332		1,918	82		252						633	1,557		(3)	65,388
4. Drink, Tobacco			104	3,371					7							12		(4)	3,494
5. Textiles except Hosiery	449				7,105	8,659	392	38		5	2	364	168		675	254	760	(5)	18,871
6. Hosiery, Clothing, Shoes, Leather						4,595		9				—36			53	152	13	(6)	4,786
7. Wood, Furniture		7					1,759	95		24	335		2,094		27	218	125	(7)	4,684
8. Paper, Printing		21		63		111		4,516		90			230		3,304	749	7,826	(8)	16,910
9. Chemicals	8,352		1,074	—32	15		154	309	4,372	118	548	12	740		2,001	464	345	(9)	18,472
10. Clay, Glass, Cement	112	47					37			1,017	48		10,378		438	38	1,205	(10)	13,320
11. Metal, engineering, Vehicles	2,541	131				245	285	120		44	7,669		7,026		9,346	356	7,219	(11)	34,982
12. Other Manufactures	1,675	315	695	148	172	379	115	133	118	382	4,799	1,257	1,773	1,495	2,460	885	2,281	(12)	19,082
13. Construction													10,241		5,553	1,954	69	(13)	17,817
14. Electricity, Gas, Water	763	347	1,467	195	435	343	197	510	174	607	897	316	315	1,436	2,674	964		(14)	11,640
15. Services except Government	13,496	308	4,513	164	128	627	36	149	69	575	170	47	11,232	321	28,361	10,017	47,078	(15)	117,291
16. Government Services																	3,983	(16)	3,983
17. Artificial NES	4,444	2,426	24,797	6,892	4,254	6,135	570	3,796	3,919	2,215	7,554	2,112	6,216	2,766	23,945	1,127	3,947	(17)	107,115
TOTAL INTER	129,465	3,725	191,652	13,182	13,297	21,849	4,175	9,771	8,946	5,881	22,146	4,093	56,414	8,346	79,498	20,725	74,851		668,016

Appendix: continued $[1-A^d]^{-1}$ *17 Sector Table for 1964*

Sector	Agriculture, Forestry, Fishing 1	Mining, Peat 2	Food 3	Drink, Tobacco 4	Textiles, except Hosiery 5	Clothing 6	Wood, Furniture 7	Paper, Printing 8	Chemicals 9	Clay, Cement, Glass 10	Metal, Engineering, Vehicles 11	Other Manufactures 12	New, Repair, Construction 13	Electricity, Gas, Water 14	Services, except Government 15	Government Services 16	Artificial Sectos, NES 17
1. Agriculture, Forestry, Fishing	1·3810	0·0004	0·8007	0·0832	0·0490	0·0064	0·0597	0·0008	0·0098	0·0006	0·0005	0·0008	0·0016	0·0004	0·0016	0·0327	0·0026
2. Mining, Peat	0·0049	1·0089	0·0067	0·0075	0·0021	0·0022	0·0028	0·0054	0·0026	0·0503	0·0024	0·0018	0·0548	0·0845	0·0017	0·0127	0·0026
3. Food	0·1147	0·0003	1·2531	0·0189	0·0043	0·0462	0·0122	0·0005	0·0149	0·0005	0·0003	0·0002	0·0007	0·0003	0·0022	0·0244	0·0022
4. Drink, Tobacco	0·0001	0·0000	0·0006	1·0993	0·0000	0·0000	0·0000	0·0000	0·0004	0·0000	0·0000	0·0000	0·0000	0·0000	0·0000	0·0002	0·0000
5. Textiles except Hosiery	0·0032	0·0019	0·0034	0·0027	1·2155	0·2116	0·0352	0·0036	0·0023	0·0025	0·0018	0·0156	0·0038	0·0022	0·0030	0·0049	0·0116
6. Clothing	0·0000	0·0000	0·0000	0·0001	0·0000	1·0917	0·0000	0·0038	0·0000	0·0000	0·0000	0·0013	0·0000	0·0000	0·0002	0·0019	0·0003
7. Wood, Furniture	0·0002	0·0008	0·0004	0·0005	0·0003	0·0004	1·1271	0·0042	0·0005	0·0020	0·0041	0·0002	0·0204	0·0003	0·0006	0·0035	0·0025
8. Paper, Printing	0·0051	0·0154	0·0156	0·0233	0·0133	0·0181	0·0055	1·1757	0·0185	0·0209	0·0084	0·0075	0·0122	0·0118	0·0160	0·0145	0·1005
9. Chemicals	0·0451	0·0015	0·0337	0·0037	0·0034	0·0022	0·0160	0·0148	1·2030	0·0099	0·0076	0·0012	0·0101	0·0012	0·0070	0·0090	0·0096
10. Clay, Cement, Glass	0·0013	0·0048	0·0027	0·0032	0·0020	0·0023	0·0037	0·0021	0·0027	1·0610	0·0018	0·0011	0·0920	0·0020	0·0034	0·0033	0·0148
11. Metal, Engineering, Vehicles	0·0178	0·0213	0·0227	0·0209	0·0131	0·0203	0·0280	0·0184	0·0177	0·0178	1·0863	0·0072	0·0739	0·0120	0·0318	0·0125	0·0952
12. Other Manufactures	0·0111	0·0244	0·0149	0·0129	0·0111	0·0152	0·0132	0·0114	0·0126	0·0314	0·0546	1·0458	0·0255	0·0616	0·0105	0·0147	0·0345
13. New, Repair, Construction	0·0013	0·0015	0·0022	0·0021	0·0013	0·0016	0·0006	0·0014	0·0017	0·0018	0·0008	0·0007	1·0864	0·0013	0·0153	0·0264	0·0092
14. Electricity, Gas, Water	0·0057	0·0215	0·0120	0·0083	0·0151	0·0114	0·0166	0·0207	0·0101	0·0397	0·0110	0·0120	0·0095	1·0547	0·0081	0·0140	0·0077
15. Services except Government	0·0893	0·0924	0·1416	0·1215	0·0772	0·0973	0·0353	0·0820	0·1026	0·1143	0·0468	0·0418	0·1488	0·0757	1·1062	0·1455	0·5355
16. Government Services	0·0019	0·0058	0·0063	0·0087	0·0055	0·0064	0·0023	0·0059	0·0077	0·0060	0·0035	0·0031	0·0036	0·0048	0·0027	1·0013	0·0418
17. Artificial Sectors N.E.S.	0·0488	0·1517	0·1643	0·2296	0·1448	0·1678	0·0595	0·1557	0·2017	0·1586	0·0915	0·0818	0·0933	0·1267	0·0719	0·0357	1·0985