**‘Product’ and ‘factor’ revaluations in Seton-Leontief type Models: illustrations from Indian Institutional sectors**

The exclusion of “demand” or “utility” considerations from the value formation has been a source of discomfort with linear models i.e. Sraffa-Leontief/Von-Newmann type models. These models accurately capture various ‘costs of production’ versions of classical political economy. Howevr in cooperation of use value based determinants in value formation has remained elusive for these models. Seton’s [Cost, use, & value] book attempts to redeem the impasse by posing “utility and factor cost based valuations” as the two entities to be simultaneously (therefore mutually complementing and consistent) discovered. His approach re-symthesises Maria Augustinovics suggestion with conventional labor/capital based valuations.

Consider an economy with three sectors. The output and deliveries made by them being reckoned in their own units or currencies i.e. Coal-Rupees, power rupees, etc.

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  |  | Coal | Power | Service | Final outputs (Z) |
| (X) | Coal | 80 crs | 10 crs | 30 crs | 30 crs |
|  | Power | 20 prs | 25 prs | 25 prs | 20 prs |
|  | Service | - | - | 10 srs | 75 srs |
| (W) | Capital | 6 krs | 18 krs | 6 krs |  |
|  | Labor | 39 lrs | 39 lrs | 27 lrs |  |
| (Z) | Output | 150 crs | 90 prs | 85 srs |  |

Or and . In terms of technical coefficients and .

The ‘classical labor values’, where only labor is the cause of value (or for neo-classicals ‘only scarce resource’), can be used to describe production processes of an economy as given by following simultaneous equations:

Solution of which is

To Use Leontief notation this is

Where,

is the row vector of homogeneous labor

is the row vector of Marxian labor values

Let Seton’s ‘' denote (read as ‘A Lin’)

Instead of labor if capital was taken as the only factor causing value, then similarly, following equation would yield the capital values:

For the above quoted numerical example capital values work out as:

Thus, following matrix of valuations provides capital and labor based valuations as rows, respectively:

|  |  |  |  |
| --- | --- | --- | --- |
| Capital based | 0.17 | 0.30 | 0.25 |
| Labor based | 0.70 | 0.52 | 0.68 |

Generlising in terms of matrix notation, is given by:

Where,

is type of factor-input per unit of total output

And denotes factor-input embodied in both direct and indirect manner

Any non-‘capitalist’ and non-‘Marxist’ would like to get rid of these labor mono-maniac values and combine both labor and capital embodied. However, combining involves the problem of attaching weights. If labor and capital are weighed at par (i.e. equal weights assigned to them, ), composite valuation is obtained:

If labor is weighted twice heavily as capital, the full composite factor cost would be .

Composite costs can be further charged with a mark-up factor. Full –factor costs thus obtained are:

Yet there is no unique principle available to ascertain values and.

Now consider there is some arbitrary notion of “use-value” (not necessarily same as utility in Walras-Jevons sense!) and that only a particular commodity, say ‘coal’, results or provides the economy ‘utility’ or ‘satisfaction’. In that case, other goods would have a contribution in use-value so far as they facilitate the production of ‘coal’. Such a system would imply all transactions to be valued in terms o ‘inal consumable coal’. Following equations describe the system:

Where,

Elements of vector are the output quotas of sector i allocated to i-consuming sectors i.e. they are row-transaction coefficients instead of being the usual column-transaction coefficients.

Final output quota per unit of output is then given by

Coal-based valuations, therefore, are . Choice of ‘power’ and ‘service’ as the ‘norm’ or basis of use-valuations instead of coal would yield in similar vein and , respectively. Thus, there may exist ‘n’ commodity-based norms if there exist ‘n’ commodities. But again the choice of norm remains arbitrary. Even I it is believed that each commodity has a use-value still there is no information on the weights (describing substitutability in use-levels) that are needed to be attached to each commodity, say .

Choice of any commodity to be used as ‘use-norm’ requires factor-use (i.e. costs) to be revalued in term of same norm. For example, if ‘power norm’ is selected then the inputs (labor and capital) will be valued as:

Similarly,

Thus, capital will be revalued by the factor 0.13. since this is valuation of factor used it is called norming of factor or ‘factor-norm’. Collecting factor norms in a matrix gives:

|  |  |  |
| --- | --- | --- |
| Capital norm | Labor norm |  |
| 0.174 | 0.256 | ‘coal’ based |
| 0.20 | 0.13 | ‘power’ based |
| 0.63 | 0.62 | ‘service’ based |

If are taken weights for use-based norms, then

will be the factor norm matrix.

Note that in ‘cost-approach’ choice was to be made between , however, in ‘use-based’ valuation choice is to be made from . However Marshallian synthesis demands a mutual consistency between these two choice problems. on one hand and on the other, must be chosen such that

And

These criterions cannot be fulfilled simultaneously by an arbitrary choice. This can be easily understood in terms of matrix formulation. Norm-matrix is given by:

This is further used to calculate cost-norm matrix () and norm-cost matrix (). Matrices calculated for the quoted example are given below:

Leaving behind the arbitrariness and stated in the language of matrix algebra, left hand eigen vectors of and corresponding to the largest positive root are to be found. For the numerical example, solutions for eigen vector of and are:

The above have to be scaled up to maintain the GNP level same i.e. .

Hence,

and

Similarly, scaling yields an adjustment factor equal to , thus . if all sectors were to have , that can be when is taken as a weight, thus, . When the weights to be assigned are unknown, implicitly same weight is given to each commodity when dealing with actual data in current prices. Therefore,

Thus implies under-valuation in actual prices and implies over-valuation in current prices. In the example, therefore, ‘coal’ and ‘power’ sectors are over-valued and ‘service’ sector is under-valued.

Similarly ‘capital input’ needs to be scaled down by (0.9991) and labor input to be scaled up by (0.0031). Revaluated in these ideal prices original table of inter-industry transaction and factor matrix (W) will appear as follows:

Since the and are eigen vectors i.e. they have a ratio like definition, they are amenable to comparison over time and across countries. provides the basis for mark-up factor from the eigen factor-norm equation.

Calculating amounts to discovering a ‘uniform rate of surplus’ or a ‘maximum rate of value-added tax’ which is equal across the sectors. Thus, procedure guarantees equal rate of surplus after revaluating the factor-rentals. It revaluates the capital input to arrive at uniform rate of ‘VAT’ or ‘surplus’. In this sense it modifies the definition of transformation problem to solve it as it neither involves remolding of labor-values into prices nor it requires two accounting systems (i.e. price and value). Moreover, it resembles Marshallian synthesis where utility-based value of factor and factor-based price of commodity are uniquely related.

II

An important advantage with this formulation is the freedom in choosing number of factor-inputs and their ‘observed’ values. Using, will then suggest the over-valuation and under-valuation. In other words, ‘distortions’ would then be revealed in terms of over and under valuations. Thus, ‘current data’ is examined from its own ‘intrinsic information. The heterogeneous labor market could be even segregated in other than traditional distinctions of ‘land’, ‘labor’ and ‘capital’. For example different types of ‘land’ or ‘skilled and unskilled labor’ or ‘public and private capital’, etc..

The process described above is illustrated in this paper by splitting the value-added (taken as a factor input valued in terms of its returns) into ‘organized and unorganized’ incomes for the Indian Economy. 14 sector classification (Table 1) of National Accounts Statistics, C.S.O., is used to do the same. Relevant structural ratios are summarized in Table 2. Treatment of imports has led to three models which are discussed as follows.

Model 1, where imports are taken as complementary, therefore Total output and final use vectors taken from Input-Output tables as it is, while total value of output of sectors was calculated. The results arrived at by applying this model are given in Table 4(a).

Model 2, where imports follow total supply approach i.e. total output ‘Z’ and total final use ‘Y’ are increased by the imports, though artificially, compensated for by including the imports as special factor ‘input’ in each sector. The relevant tables are given in Table 4(b).

Model 3, where value of imports of each sector are segregated in ratio of (O)/(U) value added shares and added to respective value added. Results of this model are given in Table 4(c).

Application of the outlined procedure in section I of the paper yields eigen prices and eigen-factor norms, given in Table 4(a), 4(b) and 4(c).

Results reveal the following:

* In all the three models following sectors have been under-valued:

|  |  |
| --- | --- |
| 1 | Agriculture |
| 2 | Forestry and logging |
| 3 | Fishing |
| 11 | Trade, hotels and rest. |
| 12 | Banking and insurance |
| 13 | Other services |
| 14 | Public administration & defense |

Note that the above sectors are a part of either primary or tertiary sector’s activities.

* In all the three models following sectors were over-valued :

|  |  |
| --- | --- |
| 5 | Manufacturing |
| 6 | Construction |
| 7 | Electricity, gas and water supply |
| 9 | Transport by other means and storage |

* Following sectors’ status of under or over valuation changed as treatment of imports are changed:

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
|  | Commodity↓ |  | Model 1 | Model 2 | Model 3 |
| 4 | Mining | 1973-74 | over-valued | over-valued | over-valued |
|  |  | 1983-84 | over-valued | under-valued | under-valued |
|  |  | 2003-04 | over-valued | over-valued | under-valued |
| 8 | Railway transport services | 1973-74 | over-valued | over-valued | over-valued |
|  |  | 1983-84 | under-valued | under-valued | under-valued |
|  |  | 2003-04 | under-valued | under-valued | under-valued |
| 10 | Communication | 1973-74 | under-valued | over-valued | over-valued |
|  |  | 1983-84 | under-valued | under-valued | under-valued |
|  |  | 2003-04 | under-valued | under-valued | under-valued |

* Changes in the extent of under or over valuation of each commodity have changed over the years. direction of these changes is mentioned below:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Direction of over/under valuation over years | | | | |
|  |  |  |  |  |
| Commodity ↓ | | Model 1 | Model 2 | Model 3 |
| 1 | Agriculture | Under-valuation increased | Under-valuation increased | Under-valuation increased |
| 2 | Forestry and logging | Under-valuation increased | Under-valuation increased | Over- valuation decreased |
| 3 | Fishing | Under-valuation decreased | Under-valuation decreased | Under-valuation decreased |
| 4 | Mining | Over- valuation decreased | Over- valuation decreased | Over- valuation decreased |
| 5 | Manufacturing | Over- valuation increased | Over- valuation decreased | Over- valuation decreased |
| 6 | Construction | Over- valuation increased | Remained Stable | Over- valuation decreased |
| 7 | Electricity, gas and water supply | Over- valuation decreased | Over- valuation decreased | Over- valuation decreased |
| 8 | Railway transport services | Over- valuation decreased | Over- valuation decreased | Over- valuation decreased |
| 9 | Transport by other means and storage | Over- valuation decreased | Over- valuation decreased | Over- valuation decreased |
| 10 | Communication | Under-valuation increased | Over- valuation decreased | Over- valuation decreased |
| 11 | Trade, hotels and rest. | Under-valuation decreased | Under-valuation decreased | Under-valuation decreased |
| 12 | Banking and insurance | Remained Stable | Under-valuation increased | Over- valuation decreased |
| 13 | Other services | Under-valuation increased | Under-valuation increased | Over- valuation decreased |
| 14 | Public administration & defence | Remained Stable | Remained Stable | Over- valuation decreased |

* One should notice that bears close relationship to . The eigen prices are evidently influenced by final output to gross output ratio as well as final output composition. Higher the ratio, there is higher likelihood of and vice-versa. Such is the case with many primary sectors. As Kravis had noted that service sector often shows higher shares from value added by sector and lower share in final output. This is referred to as the ‘splintering services’ by Bhagwati. Thus, it may be the case that lower yield based used in price calculations causes the valuation to produce ‘under-pricing’.
* When viewed from factor-input side the ‘organized factors’ have their cost over-valued by 2.03 per cent for the year 1973-74 as per model 1. Similarly imports are ‘over-valued’. Similarly, imports are over-valued by 8.8 per cent. Thus import-users and ‘organized segment’ earn quasi-rent and cause deprivation of unorganized sector. Dandekar (1986) argues income transfer of roughly 2.5 to 3 per cent from organized incomes to achieve poverty eradication which looms large in unorganized sector. Our estimates are only marginally lower (=2.03%). If over-valued imports are predominantly consumed in the organized segments then implicit transfer appears to be in agreement with Dandekar’s.
* Similar scanning of factor-rentals by ownership (e.g. public and private) f factors would also be feasible.

III

Data of Indian economy has been gathered from Input-Output Transactions Tables of 1973 to 2004 and Factor Income (2008). Both publications are of Central Statistical Organization (C.S.O.)

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|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| Table 1: Aggregation scheme (60 to 14) | |  |  |  |  |  |
|  |  |  |  |  |  |  |
| 14 sector classification | |  |  |  |  |  |
| 1 | Agriculture | 1 | 2 | 3 | 4 | 5 |
| 2 | Forestry and logging | 6 |  |  |  |  |
| 3 | Fishing | 7 |  |  |  |  |
| 4 | Mining | 8 | 9 | 10 | 11 |  |
| 5 | Manufacturing | 12 to 44 |  |  |  |  |
| 6 | Construction | 45 |  |  |  |  |
| 7 | Electricity, gas and water supply | 46 | 47 |  |  |  |
| 8 | Railway transport services | 48 |  |  |  |  |
| 9 | Transport by other means and storage | 49 | 50 |  |  |  |
| 10 | Communication | 51 |  |  |  |  |
| 11 | Trade, hotels and rest. | 52 | 53 |  |  |  |
| 12 | Banking and insurance | 54 | 55 |  |  |  |
| 13 | Other services | 56 | 57 | 58 | 59 |  |
| 14 | Public administration & defence | 60 |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| Table 2 : Some structural ratios of Indian economy (%) | | | | | |  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Commodities → | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 |
| Composition of Final Output (Z) | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1973-74 | Z (-M)† | 37.67 | 0.59 | 0.47 | 0.66 | 28.16 | 6.55 | 1.19 | 1.25 | 3.61 | 0.40 | 9.11 | 1.42 | 6.46 | 2.44 |
|  | Z(+M)‡ | 38.26 | 0.61 | 0.48 | 0.06 | 27.17 | 6.77 | 1.23 | 1.30 | 3.64 | 0.42 | 9.42 | 1.47 | 6.67 | 2.53 |
| 1983-84 | Z (-M) | 24.87 | 1.25 | 0.44 | 1.86 | 31.90 | 7.23 | 2.49 | 1.43 | 4.16 | 0.44 | 9.96 | 2.04 | 9.32 | 2.61 |
|  | Z(+M) | 24.00 | 1.20 | 0.42 | 2.82 | 33.43 | 6.88 | 2.37 | 1.36 | 4.17 | 0.42 | 9.51 | 1.96 | 8.97 | 2.48 |
| 2003-04 | Z (-M) | 13.97 | 0.49 | 0.62 | 1.44 | 34.01 | 8.61 | 3.04 | 1.08 | 7.15 | 1.12 | 10.87 | 4.11 | 10.44 | 3.05 |
|  | Z(+M) | 12.94 | 0.50 | 0.57 | 3.02 | 37.23 | 7.92 | 2.79 | 0.99 | 6.63 | 1.03 | 10.00 | 3.87 | 9.72 | 2.80 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Shares of Inputs | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1973-74 | (O) | 1.25 | 100 | 0 | 89.94 | 62.23 | 50.94 | 100 | 100 | 35.86 | 100 | 8.12 | 98.54 | 39.76 | 100 |
|  | (U) | 98.75 | 0 | 100 | 10.06 | 37.77 | 49.06 | 0 | 0 | 64.14 | 0 | 91.88 | 1.46 | 60.24 | 0 |
| 1983-84 | (O) | 7.40 | 58.09 | 0.47 | 94.13 | 57.66 | 55.84 | 93.13 | 100 | 39.01 | 100 | 6.74 | 96.79 | 27.97 | 100 |
|  | (U) | 92.60 | 41.91 | 99.53 | 5.87 | 42.34 | 44.16 | 6.87 | 0 | 60.99 | 0 | 93.26 | 3.21 | 72.03 | 0 |
| 2003-04 | (O) | 2.86 | 12.46 | 0.03 | 91.10 | 72.83 | 37.53 | 97.02 | 100 | 20.92 | 64.21 | 19.43 | 90.45 | 39.96 | 100 |
|  | (U) | 97.14 | 87.54 | 99.97 | 8.90 | 27.17 | 62.47 | 2.98 | 0 | 79.08 | 35.79 | 80.57 | 9.55 | 60.04 | 0 |
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Final-use variable | |  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| Import Composition | | |  |  |  |  |  |  |  |  |  |  |  |  |  |
| 1973-74 |  | 20.31 | 0.09 | 0.10 | 18.71 | 57.83 | 0 | 0 | 0 | 2.96 | 0 | 0 | 0 | 0 | 0 |
| 1983-84 |  | 6.47 | 0.11 | 0.05 | 22.02 | 64.14 | 0 | 0 | 0 | 4.30 | 0.17 | 0.43 | 0.42 | 1.88 | 0 |
| 2003-04 |  | 1.34 | 0.73 | 0.02 | 20.86 | 73.64 | 0 | 0 | 0 | 0.70 | 0.01 | 0.14 | 1.08 | 1.48 | 0 |

Z (-M)† and Z(+M)‡ denote Final outputs excusive and inclusive of imports, respectively

Source: Input-output transactions tables of 1973 to 2004, C.S.O., Min. of P & PI

1980-81 - 1999-2000, Statement 2.1 and 3.1, National Accounts Statistics, Factor Incomes (BASE YEAR 1999-2000), C.S.O., Min. of S & PI/2008

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 3(a) : Model 1 | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | 1973-74 | | 1983-84 | | 2003-04 | |
| Commodity ↓ | | p | P\* | p | P\* | p | P\* |
| 1 | Agriculture | 1.043683 | 0.958145 | 1.057555 | 0.945577 | 1.127722 | 0.886744 |
| 2 | Forestry and logging | 1.026894 | 0.97381 | 1.025745 | 0.974901 | 1.037068 | 0.964257 |
| 3 | Fishing | 1.045746 | 0.956256 | 1.039891 | 0.961639 | 1.0375 | 0.963856 |
| 4 | Mining | 0.98334 | 1.016942 | 0.994473 | 1.005557 | 0.989627 | 1.010482 |
| 5 | Manufacturing | 0.950709 | 1.051847 | 0.973993 | 1.026701 | 0.948626 | 1.054157 |
| 6 | Construction | 0.961631 | 1.0399 | 0.946096 | 1.056975 | 0.941781 | 1.061818 |
| 7 | Electricity, gas and water supply | 0.23021 | 4.343866 | 0.951349 | 1.051139 | 1.058051 | 0.945134 |
| 8 | Railway transport services | 0.934849 | 1.069691 | 1.143637 | 0.874403 | 1.027172 | 0.973547 |
| 9 | Transport by other means and storage | 0.905501 | 1.104361 | 0.926044 | 1.079862 | 0.942431 | 1.061085 |
| 10 | Communication | 1.00519 | 0.994837 | 1.017176 | 0.983114 | 1.037437 | 0.963914 |
| 11 | Trade, hotels and rest. | 1.032459 | 0.968562 | 1.00983 | 0.990266 | 0.999857 | 1.000143 |
| 12 | Banking and insurance | 1.017573 | 0.982731 | 1.024337 | 0.976242 | 1.011551 | 0.988581 |
| 13 | Other services | 1.005461 | 0.994569 | 0.955473 | 1.046602 | 1.018906 | 0.981445 |
| 14 | Public administration & defence | 1.035766 | 0.965469 | 1.036865 | 0.964446 | 1.0194 | 0.98097 |
| Factors↓ | | f | f\* | f | f\* | f | f\* |
| 1 | (O) | 0.980067 | 1.020338 | 0.990642 | 1.009446 | 0.981326 | 1.019029 |
| 2 | (U) | 1.00722 | 0.992832 | 1.005278 | 0.99475 | 1.014043 | 0.986151 |
| Eigen cost ratio | | 0.958366748 | | 0.96448391 | | 0.96629714 | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 3(b) : Model 2 | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | 1973-74 | | 1983-84 | | 2003-04 | |
| Commodity ↓ | | p | P\* | p | P\* | p | P\* |
| 1 | Agriculture | 1.04663 | 0.955447 | 1.055002 | 0.947865 | 1.126356 | 0.887819 |
| 2 | Forestry and logging | 1.015217 | 0.985011 | 1.024127 | 0.976442 | 1.03232 | 0.968692 |
| 3 | Fishing | 1.047907 | 0.954283 | 1.03727 | 0.964069 | 1.037337 | 0.964006 |
| 4 | Mining | 0.97522 | 1.02541 | 1.006254 | 0.993785 | 0.997739 | 1.002266 |
| 5 | Manufacturing | 0.944762 | 1.058468 | 0.980666 | 1.019715 | 0.962239 | 1.039243 |
| 6 | Construction | 0.957153 | 1.044765 | 0.947777 | 1.0551 | 0.947022 | 1.055942 |
| 7 | Electricity, gas and water supply | 0.228259 | 4.380983 | 0.953171 | 1.04913 | 1.063455 | 0.940331 |
| 8 | Railway transport services | 0.926374 | 1.079478 | 1.145662 | 0.872858 | 1.032903 | 0.968145 |
| 9 | Transport by other means and storage | 0.900212 | 1.110849 | 0.932024 | 1.072933 | 0.947418 | 1.0555 |
| 10 | Communication | 0.994034 | 1.006002 | 1.016678 | 0.983596 | 1.039977 | 0.96156 |
| 11 | Trade, hotels and rest. | 1.032652 | 0.96838 | 1.008563 | 0.991509 | 1.000116 | 0.999884 |
| 12 | Banking and insurance | 1.006217 | 0.993821 | 1.02343 | 0.977106 | 1.013374 | 0.986802 |
| 13 | Other services | 1.001577 | 0.998425 | 0.955075 | 1.047038 | 1.019527 | 0.980847 |
| 14 | Public administration & defence | 1.023577 | 0.976966 | 1.035423 | 0.965788 | 1.021244 | 0.979198 |
| Factors↓ | | f | f\* | f | f\* | f | f\* |
| 1 | (O) | 0.965684 | 1.035536 | 0.993086 | 1.006963 | 0.988667 | 1.011463 |
| 2 | (U) | 1.006287 | 0.993752 | 1.006073 | 0.993963 | 1.017985 | 0.982332 |
| 3 | M | 0.918594 | 1.088621 | 0.985203 | 1.01502 | 0.969564 | 1.031392 |
| Eigen cost ratio | | 0.95650435 | | 0.967337364 | | 0.970912192 | |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Table 3(c) : Model 3 | |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |
|  |  | 1973-74 | | 1983-84 | | 2003-04 | |
| Commodity ↓ | | p | P\* | p | P\* | p | P\* |
| 1 | Agriculture | 1.055416 | 0.947494 | 1.054423 | 0.948386 | 1.123656 | 0.889952 |
| 2 | Forestry and logging | 0.98666 | 1.013521 | 1.023143 | 0.97738 | 1.034165 | 0.966964 |
| 3 | Fishing | 1.059036 | 0.944255 | 1.036442 | 0.964839 | 1.034592 | 0.966565 |
| 4 | Mining | 0.377828 | 2.64671 | 1.008566 | 0.991507 | 1.00662 | 0.993424 |
| 5 | Manufacturing | 0.903186 | 1.107192 | 0.981858 | 1.018477 | 0.966635 | 1.034516 |
| 6 | Construction | 0.931214 | 1.073867 | 0.947687 | 1.055201 | 0.946698 | 1.056303 |
| 7 | Electricity, gas and water supply | 0.179078 | 5.584169 | 0.952954 | 1.049368 | 1.063146 | 0.940605 |
| 8 | Railway transport services | 0.886119 | 1.128517 | 1.145379 | 0.873074 | 1.031642 | 0.969328 |
| 9 | Transport by other means and storage | 0.887542 | 1.126707 | 0.932546 | 1.072333 | 0.947193 | 1.055751 |
| 10 | Communication | 0.965981 | 1.035217 | 1.015829 | 0.984418 | 1.037078 | 0.964247 |
| 11 | Trade, hotels and rest. | 1.037267 | 0.964072 | 1.007872 | 0.992189 | 0.997153 | 1.002855 |
| 12 | Banking and insurance | 0.979088 | 1.021359 | 1.022466 | 0.978028 | 1.010166 | 0.989936 |
| 13 | Other services | 0.991501 | 1.008571 | 0.954529 | 1.047637 | 1.016738 | 0.983538 |
| 14 | Public administration & defence | 0.99551 | 1.00451 | 1.034181 | 0.966949 | 1.016786 | 0.983491 |
| Factors↓ | | f | f\* | f | f\* | f | f\* |
| 1 | (O) | 0.938955 | 1.065014 | 0.991896 | 1.008171 | 0.984351 | 1.015898 |
| 2 | (U) | 1.020325 | 0.98008 | 1.005011 | 0.995014 | 1.014263 | 0.985937 |
| Eigen cost ratio | | 0.95026787 | | 0.9673247 | | 0.970823172 | |