Untitled

Methods

Eurostat develops I-O matrices at basic prices (product by product). The structure of IES derives from an aggregation of NACE classification.

IES is then represented as a $X : \{x_{i,j}\}$ I-O matrix; $x_{i,j}$ is how much system i sold to system j.

FIGURE

$x_{i,j}$ can be normalised into a proportion through the columns:

$$a_{i,j} = \frac{x_{i,j}}{\sum\limits_{j} x_{i,j}} \tag{1}$$

where $\sum\limits_{j} x_{i,j}$ is the sum of the row of $x_{i,j}$; or through the rows:

$$b_{i,j} = \frac{x_{i,j}}{\sum\limits_{i} x_{i,j}} \tag{2}$$

where $\sum\limits_{i} x_{i,j}$ is the sum of the column of $x_{i,j}$.

$a_{i,j}$ is the proportion of how much j buys from i compared to other i-sellers. $b_{i,j}$ is the proportion of how much i sells to j among the j-buyers of i.

From this matrix, four indicators of the generic Y system are derived:

- **Size**:

$$\text{SIZE}(Y) = \frac{\left[\sum\limits_{j} x_{i,j} \mid (i = Y)\right] + \left[\sum\limits_{i} x_{i,j} \mid (j = Y)\right]}{2 \cdot \sum X} \tag{3}$$

where $\sum X$ is the sum of all $x_{i,j} \in X$.

- **Self-reliance**:

$$\text{SELF}(Y) = \frac{a_{i,j} + b_{i,j}}{2} \mid (Y = i = j) \tag{4}$$

- **Ubiquity**:

$$\text{UBIQ}(Y) = \left(\sum_{j} b_{i,j}^2\right)^{-1} \mid Y = i \tag{5}$$

- **Financial Parity**:

$$\text{PRTY}(Y) = \left(\sum_{i} a_{i,j}^2\right)^{-1} \mid Y = j \tag{6}$$

Equation 5 and Equation 6 are reciprocals of the Repeat Rates of $a_{i,j}$ and $b_{i,j}$, hence as demonstrated in Appendix XXX, these measures are specifications of the general function of "Ecological Diversity" and they measure how balanced is the diversification of the input-output fluxes. In particular, Ubiquity is a measure of balanced diversification in how much other ecosystems demand goods and services to Y and Financial Parity is a measure of balanced diversification in how Y allocates its budget of expenditure.

Interpretation

- SIZE is the proportion of money involved in that EcoSystem over the whole number of money circulated in the country. It ranges from 0 (the ES is not existent) to 1 (the ES coincides with the country). Since there are 14 countries, a balanced uniform value would be .07

- SELF is the proportion of money that the EcoSystem trades with itself. It ranges from 0 (the ES is a pure fictional intermediary of other exchanges) to 1 (the ES always refute to trade with others).

- UBIQ is an indicator of how the ES serves the national economy when it does not exchange with itself. It ranges from 1 (exists as a mere supplier of another ES) to 14 (its a supplier of all other ES).

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- PRTY is an indicator of how the ES buys a highly differentiated range of goods and services with no financial discrimination. A high value of it signals that investment in this ES is financially fair and does not favor specific groups of stakeholders. It ranges from 0 (it is only a buyer of another ES, i.e. financing it means to actually raise a lot of inequalities) to 1 (it buys from everybody, financing it it-s like giving money to everybody).

Dataviz

	SIZE	SELF	UBIQ	PRTY
SIZE	1	0.09	0.1	0.1
SELF		1	0.85	−0.84
UBIQ			1	−0.59
PRTY				1

Shift 2015–2018