

Data compilation

Employment supported and value added generated by EU exports is calculated through Leontief-type input-output modelling using the FIGARO inter-country input-output tables (industry-by-industry). The relation between total sectoral output \mathbf{x} , intermediate consumption \mathbf{Z} , and final consumption \mathbf{Y} is defined by the accounting equation $\mathbf{x} = \mathbf{Z}\mathbf{u} + \mathbf{Y}\mathbf{u}$, where \mathbf{u} is the summation vector. Similarly, the basic identity of total output equalling total input can be expressed by the equation $(\mathbf{x})' = (\mathbf{u})'\mathbf{Z} + \mathbf{t} + (\mathbf{u})'\mathbf{W}$, where \mathbf{W} is the gross value added, \mathbf{t} represents taxes less subsidies on products, and $(\mathbf{x})'$ denotes transposition of vector \mathbf{x} .

The input coefficients matrix is defined as $\mathbf{A} = \mathbf{Z}\langle\mathbf{x}\rangle^{-1}$, which describes input structures per unit of sectoral output. Here, $\langle\mathbf{x}\rangle$ denotes the diagonalised vector \mathbf{x} , and $\langle\mathbf{x}\rangle^{-1}$ stand for the inverse of matrix $\langle\mathbf{x}\rangle$. Superscripts s and r denote the origin and destination countries respectively, in \mathbf{Z} and \mathbf{Y} . However, this is not the case in matrix \mathbf{W} , where origin and destination refer to the same country denoted by superscript s .

To obtain the desired indicators, three more types of matrices need to be calculated:

- the domestic Leontief inverse for non-EU countries $\mathbf{L}^{rr} = (\mathbf{I} - \mathbf{A}^{rr})^{-1} \forall r \in \{\mathbf{RW}\}$,
- the global Leontief inverse $\mathbf{B} = (\mathbf{I} - \mathbf{A})^{-1}$, and
- the EU Leontief inverse $\mathbf{R} = (\mathbf{I} - \mathbf{A}^{rs})^{-1} \leftrightarrow r, s \in \{\mathbf{EU}\}$.

The sets $\{\mathbf{EU}\}$ and $\{\mathbf{RW}\}$ respectively denote the 27 EU Member States and 19 non-EU 'countries' covered in FIGARO (18 countries and a 'Rest of the world' region combined).

Lastly $(\mathbf{v}^r)' = (\mathbf{u})'\mathbf{W}\langle\mathbf{x}\rangle^{-1}$ represents gross value added in country r per unit of sectoral output. Similarly, employment in country r per unit of sectoral output is obtained following $(\mathbf{q}^r)' = (\mathbf{u})'\mathbf{Q}\langle\mathbf{x}\rangle^{-1}$, where \mathbf{Q} is total employment by industry in thousand persons.

Employment content in EU exports \mathbf{i}^{ts} from EU Member State \mathbf{t} to non-EU country \mathbf{s} via country \mathbf{r} is calculated with employment intensity vector \mathbf{q} as:

$$\mathbf{i}^{ts} = \langle\mathbf{q}^t\rangle\mathbf{R}^{tr}\langle\mathbf{e}^{rs}\rangle$$

$$\mathbf{t}, \mathbf{r} \in \{\mathbf{EU}\} \wedge \mathbf{s} \in \{\mathbf{RW}\} \forall \mathbf{s}$$

Value added content in EU exports \mathbf{d}^{ts} from EU Member State \mathbf{t} to non-EU country \mathbf{s} via country \mathbf{r} is calculated as:

$$\mathbf{d}^{ts} = \langle\mathbf{v}^t\rangle\mathbf{R}^{tr}\langle\mathbf{e}^{rs}\rangle$$

$$\mathbf{t}, \mathbf{r} \in \{\mathbf{EU}\} \wedge \mathbf{s} \in \{\mathbf{RW}\} \forall \mathbf{s}$$