EUROPEAN COMMISSION
EUROSTAT
Unit C.2: National Accounts - Production
Unit E.7: Environmental Accounts and Climate Change
JOINT RESEARCH CENTRE
Institute for Prospective Technological Studies
Unit J.6: Sustainable Production and Consumption

eurostat

Contact:
Isabelle Remond-Tiedrez (ESTAT.C.2), +352 4301-36905, isabelle.remond-tiedrez@ec.europa.eu
Stephan Moll (ESTAT.E.7), +352 4301-30198, stephan.moll@ec.europa.eu
José M. Rueda-Cantuche (JRC.IPTS.J.6), +34 95 448 8363, jose.rueda-cantuche@ec.europa.eu

Technical Documentation eeSUIOT project:

Creating consolidated and aggregated EU27 Supply, Use and Input-Output Tables, adding environmental extensions (air emissions), and conducting Leontief-type modelling to approximate carbon and other 'footprints' of EU27 consumption for 2000 to 2006

23 March 2011

Commission européenne, 2920 Luxembourg, LUXEMBOURG - Tel. +352 43011

http://epp.eurostat.ec.europa.eu

Acknowledgements

This Eurostat report is the combined result of two projects commissioned by Eurostat.

The first project has been conducted by Eurostat C.2 with support of the Joint Research Centre's Institute for Prospective Technical Studies (JRC-IPTS) and the Konstanz University of Applied Sciences. That work has been focussing on creating consolidated Supply and Use Tables (SUTs) for the aggregated European Union (EU27) and the euro area (EMU17). This work is mainly covered by chapter 2 and parts of chapter 3 presented in this report.

The second project has been commissioned by Eurostat E.7 and performed by a consortium consisting of the Netherlands Organisation for Applied Scientific Research (TNO), the Centre of Environmental Sciences of Leiden University (CML), the Norwegian University of Science and Technology (NTNU), and University of Groningen (RuG). This work has been focussing on creating and analysing European environmentally extended Input Output tables, and is covered by chapter 4 to 6 and parts of chapter 3 in this report.

Contributions to this report were made by the following authors:

Joerg Beutel (Konstanz University of Applied Sciences, chapter 2)

Maaike C. Bouwmeester (RuG, chapter 3)

Stephan Moll (Eurostat E.7, chapters 4, 5, 6 and overall editing)

Isabelle Remond-Tiedrez (Eurostat C.2, chapters 2 and 3)

José M. Rueda-Cantuche (JRC-IPTS, chapters 2 and 3)

Arnold Tukker (TNO, chapter 1 and overall editing)

Richard Wood (NTNU, chapters 4 and 5)

We would like to dedicate this work to our late colleague Peter Ritzmann of Eurostat C.2, who took the initiative to start this project of constructing consolidated Supply, Use and Input-Output tables for the aggregated EU27 and the euro area.

Preferred citation of this report: EUROSTAT (2011), Creating consolidated and aggregated EU27 Supply, Use and Input-Output Tables, adding environmental extensions (air emissions), and conducting Leontief-type modelling to approximate carbon and other 'footprints' of EU27 consumption for 2000 to 2006. Luxembourg: Eurostat

Table of content

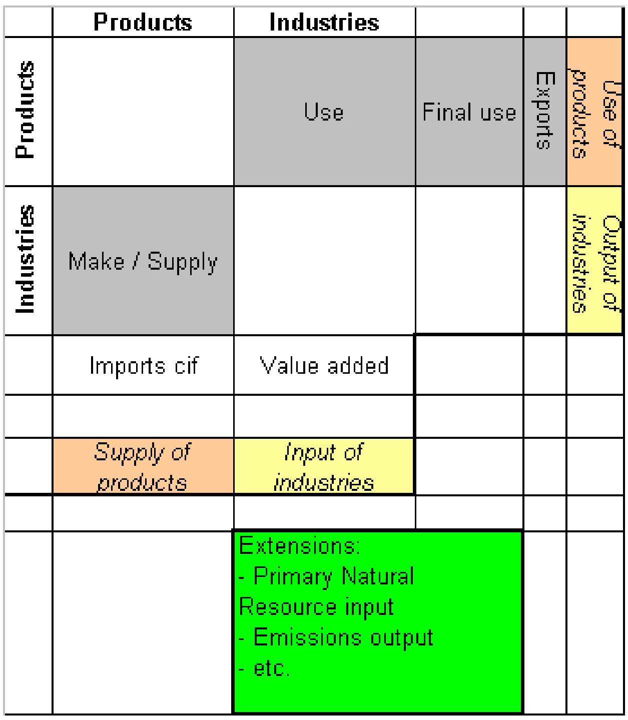
1. OVERVIEW

1.1. Introduction

The input-output framework as exemplified by the European System of Accounts (ESA95) consists of three types of tables: Supply and Use tables (SUT) and symmetric Input-Output tables (IOT) (Eurostat 1996; UN 1999; Eurostat 2008). Eurostat's transmission programme requires EU member states to transmit SUTs annually and IOTs every five years in a standardized format for 60 industries (NACE[1] rev. 1.1) and 60 products (CPA).

The Supply table shows the supply of 60 goods and services, both domestic and imported, by type of supplier in basic prices, while the Use table shows the use of 60 goods and services by type of use in purchaser prices, i.e. as intermediate use by industries and final use (consumption expenditures, gross capital formation, and exports). The Use table also contains the components of the value added by industry, i.e. compensation of employees, other taxes less subsidies on production, and gross operating surplus. The Use table can be converted to basic prices with the help of valuation matrices reflecting retail/wholesale margins, transport margins and taxes/subsidies per product used per industry. ESA95 does not oblige EU member states to transmit these valuation matrices.

Figure 1.1: Schematic SUT with environmental extensions



[1] Up from reference year 2008, the revised NACE rev.2 will be applied

SUT and IOT can be expanded with satellite accounts to indicate industries' resource inputs from and emission outputs to the environment (see Figure 1.1). Data for emissions to air (eight substances) are available in the same sector format from (voluntary) Air Emissions Accounts (Eurostat, 2009).

In sum, at the level of individual member states Eurostat has available time series of Supply tables (in basic prices) and Use tables (in purchaser prices) as well as a set of emissions to air in the same sector format. In principle, such a set of data can support a large number of interesting analytical applications. The emission intensity per industries per country can be compared. Emissions related to final consumption can be calculated. It can be analysed which part of such consumption-related emissions take place on own territory and which part takes place abroad – forming 'pollution embodied in imports'. Yet, the aforementioned data sets cannot yet be used for such analytical applications for the following reasons:

1. The data is available for individual member states only, and building aggregated EU (and euro area) tables from this is not trivial.

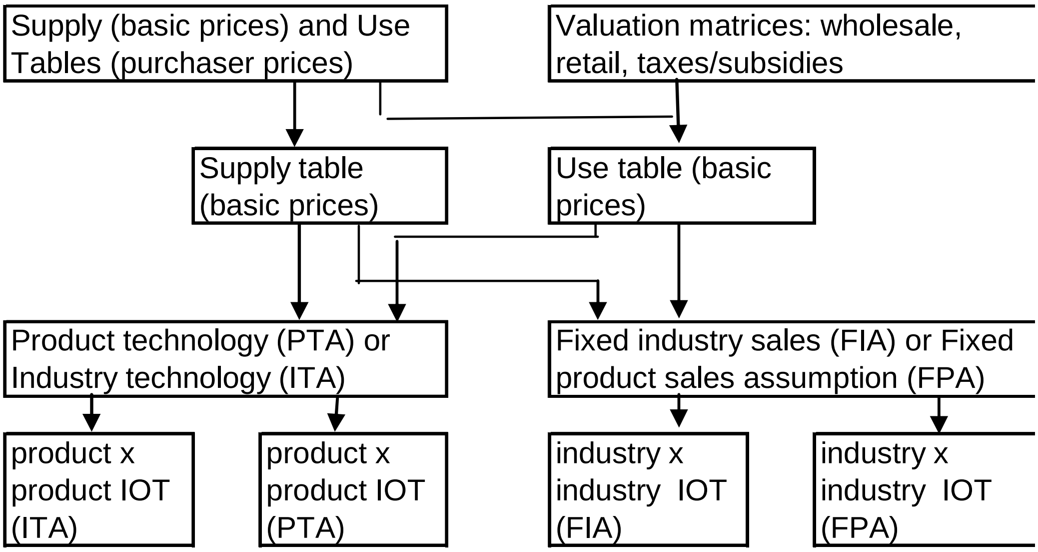
2. Most analytical applications and models are based on Input-Output tables (IOT) rather than SUT. Examples include the calculations of environmental impacts related to final consumption, and scenario studies making use of CGE models. IOT can be derived from SUT using certain assumptions, but a precondition is that the Use table is available in basic prices, which for most countries is not the case.

Eurostat hence launched a set of projects to solve these problems. One project aimed at creating consolidated SUTs for the aggregated EU27 and euro area. The other project would enrich this table with environmental extensions, and perform some illustrative analyses with the data. This report summarises in the next section the main steps taken in the combined project, whereas the next chapters describe in detail how each step was executed and lead to the final data set as published on the Eurostat website.

Box 1.1: Supply and Use and Input-Output Frameworks

Using various assumptions about technology, symmetric Input-Output tables can be derived from Supply and Use tables in basic prices. The tables can be of a product-by-product type or an industry-by-industry type. An industry-by-industry IOT essentially maps the purchases and sales of each industry sector to and from all other industry sectors. A product-by-product IOT maps in monetary terms how which products are used to produce a specific product. Figure 1.2 visualises the relation between SUT, valuation matrices, and IOTs. We refer to the standard literature, including Leontief and Ford (1970), Miller and Blair (2009), Ten Raa, (2005) and Eurostat, 2008, as well as Ten Raa and Rueda-Cantuche (2003 and 2007).

Figure 1.2: Simplified input-output framework (modified from Rueda-Cantuche et al., 2009)



1.2. Project approach

Combining individual country SUT to a SUT for the EU27 is not trivial. As indicated, a first problem is that the Supply and Use tables collected by Eurostat are not in the same (basic) price. Next to this, the SUT of individual countries include imports and exports – which need to be separated from domestic supply and use. Furthermore, the imports and exports reported by each EU member state are totals – they do not distinguish between member states from which is imported or to which is exported. Finally, there are trivial problems, such as that some EU member states have been unable to transmit SUT or still had exemptions.

In the ideal case, this project would have produced SUT in basic prices for each member state, estimated bilateral imports and exports, and created a so-called multi-regional SUT for the EU27 in which each EU member state would have been visible individually. Crucial for this is insight in valuation data that help transforming the Use table in purchaser prices to basic prices. For a large number of EU member states, such data could not be obtained from public sources. Various national statistical offices were able to provide additional data, under the provision they would not be published externally at member state level. This constraint forced the project to concentrate on building consolidated Supply and Use tables for the aggregated EU[2] only.

Overall, this lead to a project structure as following:

[2] Supply and Use tables for the euro area were estimated as well but not extended by environmental extensions.

1. For each EU member state, SUT in basic prices had to be estimated with the available SUT (in basic/purchaser prices) and auxiliary data. This work is described in chapter 2.

2. The SUT for the individual Member States had to be consolidated and aggregated to a EU27 SUT. The main sub-steps included (see chapter 3):

    a. For each country, separating the Use table in an import use and domestic use part;

    b. Further separating the import use tables in an intra-EU import use table and an extra-EU import use table.

    c. Aggregating all domestic use, intra-EU import use, and extra-EU import use tables;

    d. Confronting and rebalancing the intra-EU import use with the intra-EU export supply totals (which in theory should be identical apart from valuation differences, but in practice are not so, due to the fact that these data is reported by different countries and hence may be subject to statistical errors);

    e. Moving differences to the rest of world; neglecting the (now identical) intra-EU import use and intra-EU export supply, and creating a consolidated EU SUT by aggregating the individual country domestic SUT and intra-EU import use and export supply tables.

3. To the EU27 SUT, environmental extensions had to be added, and the SUT had to be transformed into an IOT (chapter 4 and 5).

4. On the combined EE IOT, basic modelling was necessary to generate analytical results (most notably creating a Leontief inverse; see chapter 5)

5. Finally the resulting data sets obtained are described (see chapter 6).

The next chapters will discuss the five main blocks in this project as outline above.

2. ESTIMATION OF MISSING NATIONAL SUPPLY AND USE TABLES IN BASIC PRICES

The objective of the joint research project was to compile different consolidated European tables on an annual frequency from years 2000 to 2006:

- Supply table at basic prices with a transformation to purchaser's prices;
- Use table at basic prices broken down into domestic and imports uses;
- Symmetric product-by-product input-output table broken down into domestic and imports uses.

The consolidated European Supply and Use tables are based on the national data. As the official transmission program includes only Use tables at purchaser's prices, Eurostat asked the National Statistical Institutes (NSI) for their support and received relevant data on top of the official transmission, i.e. valuation matrices and/or Use tables at basic prices.

The aggregated European symmetric Input-Output tables are calculated from the consolidated and aggregated Supply and Use tables, not as an aggregation procedure of the national symmetric Input-Output tables (see Rueda-Cantuche et al., 2009 for an example of the latter approach). Eventually, they have been constructed assuming the industry technology assumption (see Eurostat 2008 pp. 347-357).

The entire project focuses on tables at current prices only. The use of an average exchange rate to convert national currency units in Euro might not be representative in the cases where the time variance of exchange rates is significant. This aspect will deserve further attention, e.g. by using purchasing power parities.

2.1. Valuation of tables: purchaser's prices and basic prices

The official transmission program requires supply tables at basic prices on the one hand (with a transformation to purchaser's prices) and use tables at purchaser's prices on the other hand. The valuation of the two tables does not coincide.

The definitions of the different valuation are given in the European System of Accounts (ESA95), paragraphs 3.48 and 3.06.

> (3.48) The **basic price** is the price receivable by the producers from the purchaser for a unit of a good or service produced as output, minus any tax payable (see point 4.27) on that unit as a consequence of its production or sale (i.e. taxes on products), plus any subsidy receivable on that unit as a consequence of its production or sale (i.e. subsidies on products). It excludes any transport charges invoiced separately by the producer. It includes any transport margins charged by the producer on the same invoice, even when they are included as a separate item on the invoice.

(3.06) At the time of purchase, the **purchaser's price** is the price the purchaser actually pays for the products; including any taxes less subsidies on the products (but excluding deductible taxes like VAT on the products); including any transport charges paid separately by the purchaser to take delivery at the required time and place; after deductions for any discounts for bulk or off-peak-purchases from standard prices or charges; excluding interest or services charges added under credit arrangements; excluding any extra charges incurred as a result of failing to pay within the period stated at the time the purchases were made.

Thus the relationship[3] between the different prices can be summarized as follows:

(1) Purchaser's prices (excluding any deductible VAT)

- trade and transport margins

- non-deductible VAT

- taxes on products

+ subsidies on products

= Basic prices

The trade and transport margins and the taxes less subsidies on products matrices are called valuation matrices. For the purpose of construction of symmetric Input Output Tables, both Supply and Use tables should be measured in basic prices. The Use table at basic prices can be calculated as the difference from the Use table at purchaser's prices and the valuation matrices.

However, the information on valuation matrices and/or Use tables at basic prices is incomplete. For some countries, we relied on supplied data from either the official transmission programme or from a voluntary basis. For other countries, we defined a set of "itineraries" with the aim to estimate the missing Use tables at basic prices.

2.2. Data situation

Eurostat has benefited from data that was not part of the official data transmission program from member states. The tables used in this project are listed in Table 2.1.

Table 2.1: List of tables of the project

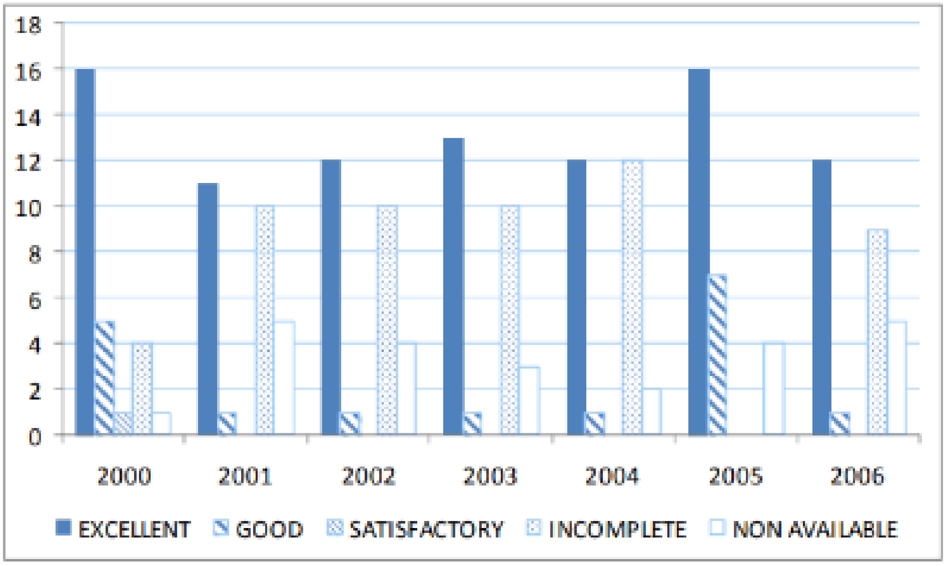
Official tables	
SUP	Supply table at basic prices with a transformation into purchaser's prices (yearly)
USEpp	Use table at purchaser's prices (yearly)
SIOT	Symmetric input-output tables at basic prices product by product (5-yearly) except for Denmark, Finland and Netherlands, which are

[3] See Figure 4.3 Output valuation criteria of the Eurostat (2008) Manual of Supply, Use and Input-Output Tables, p 91.

	of the industry by industry type.
SIOTdom	Symmetric input-output table for domestic output at basic prices (product by product) (5-yearly) except for Denmark, Finland and Netherlands, which are of the industry by industry type.
SIOTimp	Symmetric input-output table for imports at basic prices (product by product) (5-yearly) except for Denmark, Finland and Netherlands, which are of the industry by industry type.
Additional tables	
USEbp	Use table at basic prices (table 1610)
USEdom	Use table for domestic output at basic prices (table 1611)
USEimp	Use table for imports at basic prices (table 1612)
TTM	Trade and transport margins matrix (table 1620)
TLS	Taxes less subsidies matrix (table 1630)
X(-1)	Table X for previous year

The aim of this step (chapter 2) is to get for every country the set of tables: SUP, USEbp, USEdom, USEimp. From the single country estimations, the next step (chapter 3) will be to aggregate the data at European level. For this purpose, the Use tables for imports have been split for every country between imports from extra-EU27 and intra-EU27. For countries within the euro area, two other Use tables have been estimated: use tables for imports intra euro area and use tables for imports extra euro area.

Figure 2.1: data situation in EU27 for years 2000 to 2006



Depending on the availability of those tables at the national level, countries have been grouped into 5 different situations (see Figure 2.1 and the Annex 1 for full details):

- Excellent data situation (E)
- Good data situation (G)
- Satisfactory data situation (S)
- Incomplete data situation (I)

- No data available (N)

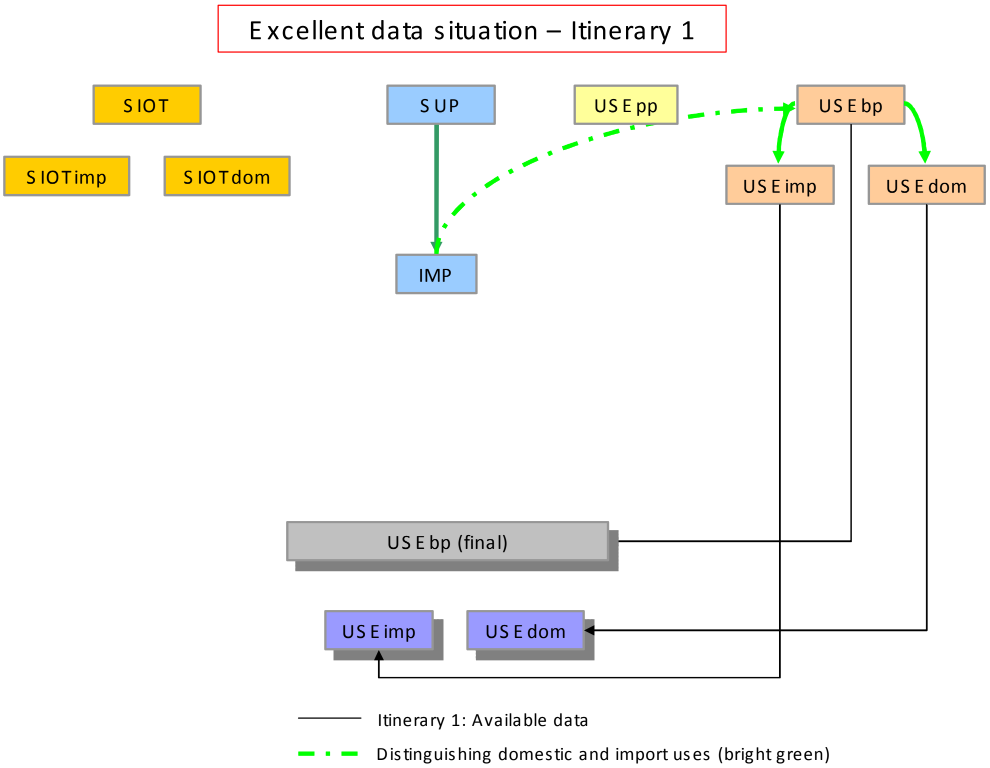
For the 5-yearly data transmission including symmetric Input-Output Tables in 2000 and 2005, the data situation is much better. As of December 2010, the data situation for the period 2000-2006 is shown in the Annex 1.

2.2.1. *Excellent data situation*

In this case, all the necessary tables (either provided by the official data transmission or on a voluntary basis) are available for every year. This does not mean that we may not need to make some further estimations and checking, e.g. the distinction between imports and domestic uses when we are given only the use table (total) at basic prices. Indeed, we only checked the consistency of the supplied tables, especially the use table at basic prices in comparison to the result of deducting the trade and transport margins and taxes less subsidies matrix from the use table at purchasers' prices (see equation (1)).

The schema presented below (Figure 2.2) summarises the approach:

Figure 2.2: Data flowchart – Excellent data situation – Itinerary 1



2.2.2. *Good data situation*

The Supply and Use tables (at purchaser's prices) are available. The symmetric (domestic and import) Input-Output tables (product-by-product or industry-by-industry) at basic prices are available. Generally speaking, from the Use table at purchasers' prices we obtain the value added components, which remain unchanged when converting the Use table from purchasers' prices into basic prices.

Next, from the symmetric Input-Output table (only if it is of the product-by-product type), we can obtain the final demand values, which are the same as those of the symmetric Input-Output table since the conversion from Use table at basic prices into symmetric ones does not imply any change in the values of the final demand categories. Subsequently, only the intermediate part of the Use table at basic prices is actually unknown.

However, the following itineraries deal with adjustments in both intermediate and final uses since margins and net taxes on products are rarely available for intermediate and final uses separately. Therefore, the resulting Use table at basic prices will only be a first draft, which will have to be balanced once the correct values for the final demand are imposed (recall that this is true only for product-by-product Input-Output tables).

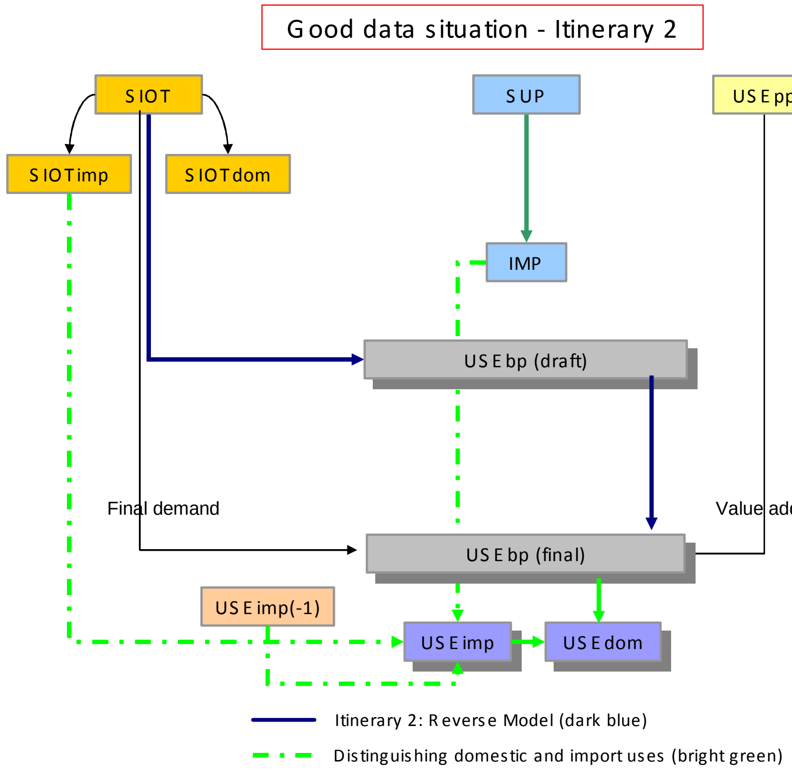
To estimate the Use tables for imports and domestic uses, we will generally distribute the product based import column vector (IMP) of the Supply table on a proportional basis using the row shares of the estimated total Use table at basic prices (USEbp final). Another option would be to use the Reverse Model A from the symmetric Input-Output table of imports based on the domestic product technology assumption. However, this assumption might be considered too strong since it would imply that all imports were to be produced with one single technology assumption independently of the country of origin.

As well, another option could be to take the structure of a previous known Use table of imports, which we think it would give the best empirical results but unfortunately, their availability is generally scarce. A second best option would be to use the row structures of the symmetric Input-Output table of imports. By difference, the domestic use table at basic prices is then derived from deducting the use table of imports to the use table of total uses.

Up to three different options will be evaluated here for the estimation of the intermediate part of the Use table at basic prices:

1. **Itinerary 2**; assuming that the symmetric Input-Output table has been constructed only using the product technology assumption (see Eurostat 2008 Manual of Supply, Use and Input-Output Tables, pp.347-357), we derive the Use table at basic prices directly from the Supply table and the symmetric Input-Output table.

Figure 2.3: Data flowchart - Good data situation – Itinerary 2



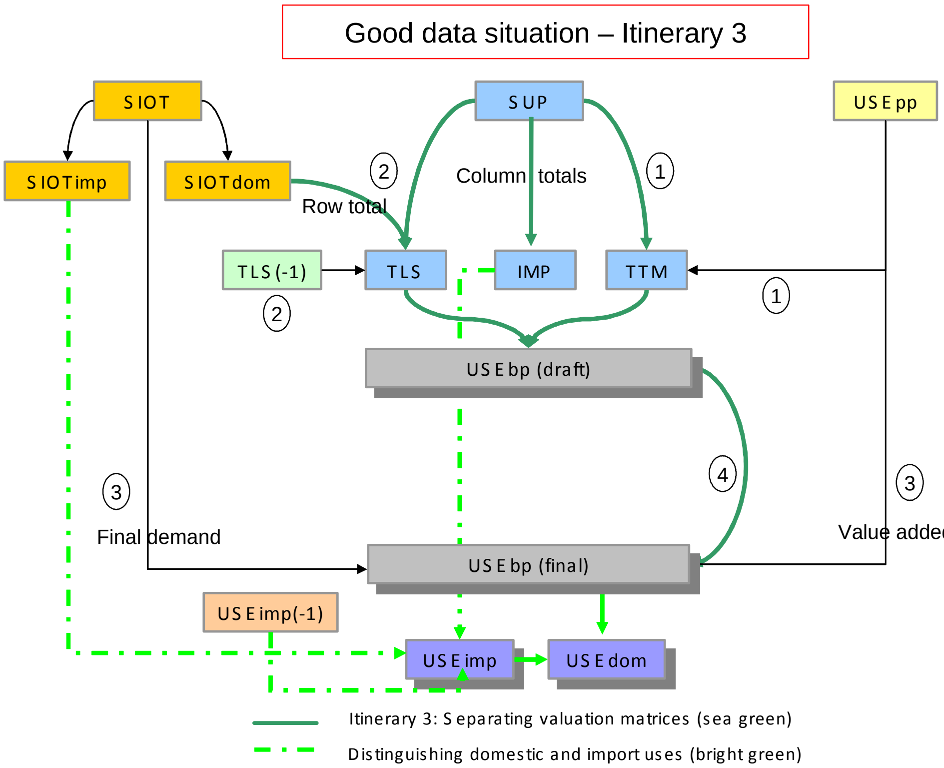
The mathematical expression can be found in the cited Eurostat 2008 Manual on p. 352 (Reverse Model A) and will always provide non-negative values. Doing so, there is no need to compute valuation matrices.

For the distinction between domestic and import uses either we may reverse the domestic and imported symmetric Input-Output tables separately or assume other kind of information to split the total uses at basic prices into domestic and imports intermediate (and final demand) uses.

2. **Itinerary 3;** Compile the trade and transport margins matrix by row-wise allocating the corresponding column vector of the Supply table. The structures are taken either from the Use table at purchasers' prices or from available distribution margin matrices of other years. Next, the estimation of the taxes less subsidies is the main issue. In order to do so, we can use two different approaches:

    - <u>Reverse Model A</u> (Eurostat 2008 Manual, p. 352); by applying the product technology assumption we can derive a use table at basic prices as in Itinerary 2 and then, by difference calculate the taxes less subsidies matrix. Unfortunately, the empirical practice does not provide good evidence that this method works properly provided that statistical offices can construct symmetric input-output tables in many different ways. Although, information from countries on the methods they use to compile the input-output table may optimise the model to use (see other methods in the Eurostat 2008 Manual, pp. 347-357).

Figure 2.4: Data flowchart - Good data situation – Itinerary 3



- o <u>Use the same structure of taxes less subsidies matrices of another year or similar country</u>; this initial matrix will have to be balanced using the Double RAS[4] (D-RAS) method (modified RAS that allows negative elements not only within the matrix but also in the row and column totals) against the new column benchmark of the corresponding Supply table. Nonetheless, the symmetric Input-Output table (if it is of the industry-by-industry type) also can provide a benchmark for the row totals. In other case, one could suppose the same benchmark as well but taking into account that the rows are on a product basis rather than on an industry basis, which induces to some additional error. For the sake of simplicity, Figure 2.4 will only reflect this option.

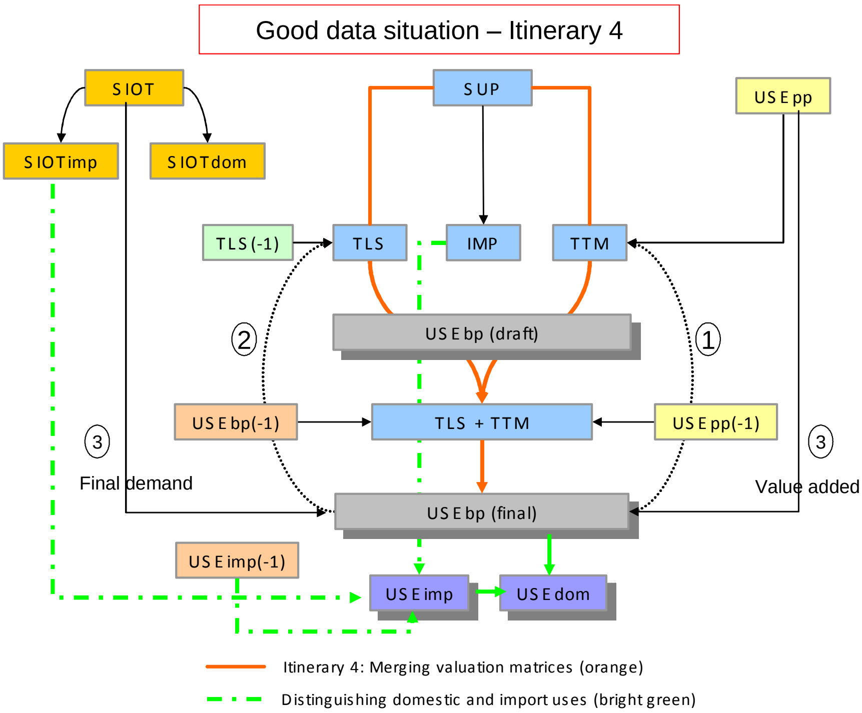
The empirical evidence shows that the use of an existing structure of a previous year is the option that performs best. For the sake of simplicity, Figure 2.4 will only reflect the second option. Once the valuation matrices have been estimated separately then, the Use table at basic prices is calculated as in equation (1). The encircled numbers refer to the step-wise procedure by which (1) trade and transport margins are estimated; (2) the taxes less subsidies are calculated on the basis of SIOT information or a previous net taxes on products structure; (3) final demand and value added are extracted from the SIOT and the Use table at

[4] The Double RAS method has been implemented and developed by the Joint Research Centre – IPTS. It basically leaves out the negative values to balance the remaining non-negative matrix. The GRAS method could not be used since it is not defined for dealing with negative row and/or column totals, as it occurs in the taxes less subsidies on products matrices.

purchasers' prices; and (4) the intermediate part of the draft Use table at basic prices is balanced.

3. **Itinerary 4;** this approach needs to have a use table at basic prices of a previous year or of a similar country together with a use table at purchasers' prices. Then, by deducting the use table at basic prices from the use table at purchasers' prices, one could obtain the official joint matrix of the two valuation matrices merged, which will be adjusted to the benchmark year using the D-RAS method.

Figure 2.5: Data flowchart - Good data situation – Itinerary 4



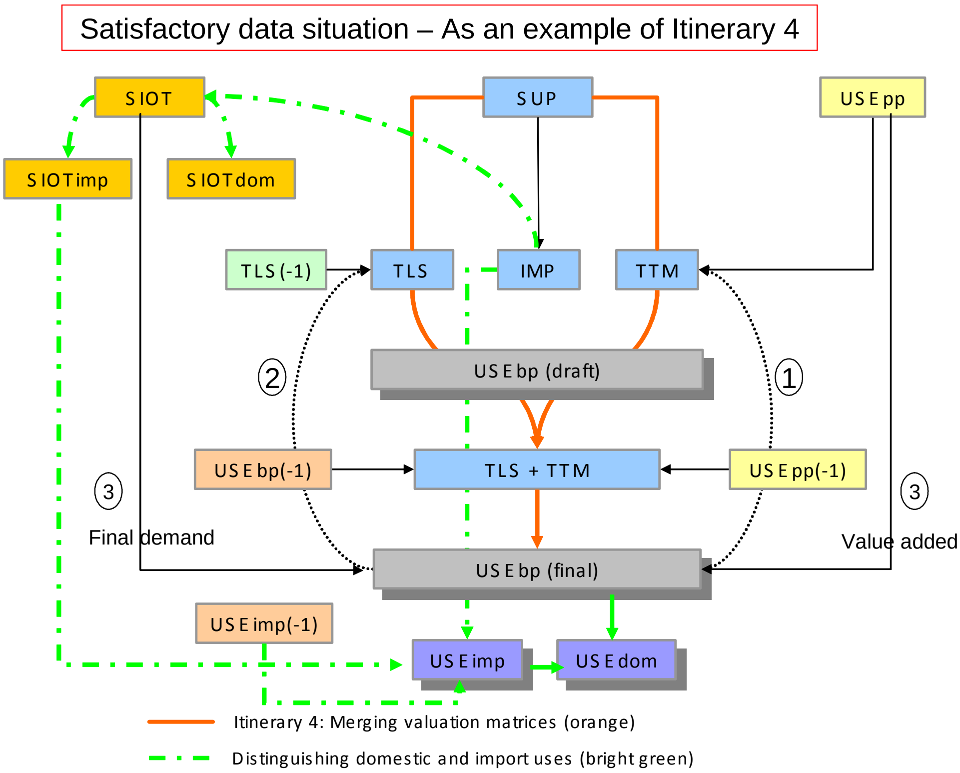
In this case, the question shall be reduced to separate margins from net taxes on products so subsequently, one has to compile first the trade and transport margins matrix by row-wise distributing the corresponding column vector of the Supply table (encircled 1 in Figure 2.5) and afterwards, calculate the taxes less subsidies by difference with respect to the balanced joint matrix of valuation tables (encircled 2 in Figure 2.5). Sometimes you may get more reliable information on structures of taxes less subsidies and operate the other way round. Finally, value added and final demand are imposed from the SIOT and the Use table at purchasers' prices, respectively (encircled 3 in Figure 2.5).

An empirical test was carried out for the Czech Republic for 2007. The three itineraries were tested using in itinerary 2 an existing taxes less subsidies matrix (2006). The results confirmed that the use of the Reverse Model A (itinerary 2) should be abandoned provided the uncertainty and variability of the methods used by national statistical offices. The overall difference with respect to the other two itineraries amounts to 5.6% of the total intermediate inputs while the overall difference between itinerary 3 and itinerary 4 was only about 0.7%. In addition, we ran another test for Austria (2005) and found that the best method (the one that provided the closest results to the official tables) was itinerary 3 using both benchmarks provided by the Supply table (column) and the symmetric Input-Output table (row). This result is independent of the type of Input-Output table that we may dispose of.

2.2.3. Satisfactory data situation

This case is merely the same as the 2.2.2 Good data situation but without the distinction between domestic and import uses in the symmetric Input-Output table. Only the Supply and Use tables (the latter at purchaser's prices) and the symmetric Input-Output table (total) at basic prices (SIOT) are available.

Figure 2.6: Data flowchart – Satisfactory data situation



The procedure to follow can be Itinerary 2, 3 or 4 (in Figure 2.6, we chose Itinerary 4 as an example) but adding a preliminary step to decompose the SIOT table into the Input-Output table for imports and for domestic uses. The black thin arrows that are going from the SIOT box to the SIOTimp and SIOTdom boxes (see Figure 2.5) would now turn into bright green ones to show that these tables will have to be estimated previously and do not come from statistical sources any more.

Information from the external trade statistics and balance of payments statistics should be used as much as possible to estimate SIOT dom and SIOT imp. The column vector of imports coming from the Supply table also can be used as benchmark. Adjustments procedures using bi-proportional adjustments can be made if necessary.

2.2.4. *Incomplete data situation*

Only Supply and Use tables at purchaser's prices are available[5]. Itineraries 3 and 4 can be used for the calculation of the Use tables at basic prices (see Figures 2.7 and 2.8).

However, the absence of symmetric Input-Output tables is crucial for the final calculations in two ways. Firstly, the choice between the two itineraries will depend on the availability of:

- previous years' valuation matrices;
- previous years’ Use tables at purchaser's prices;
- previous years’ Use tables at basic prices;
- previous years’ Use tables of imports at basic prices;
- previous years’ symmetric Input-Output tables;
- all these tables for a neighbouring and/or similar country.

The results can be eventually adjusted using bi-proportionality methods.

Secondly, the split of Use table at basic prices between imports and domestic uses is made using as much information as possible (external trade data and balance of payments data) and/or allocating row-wise the import vector (IMP) coming from the supply table.

[5] However, we will also consider “incomplete data situation” when only the symmetric input-output tables are available. In that case, previous years’ tables must be used as proxy of input and supply structures.

Figure 2.7: Data flowchart – Incomplete data situation (Itinerary 3)

Incomplete data situation – As an example of Itinerary 3

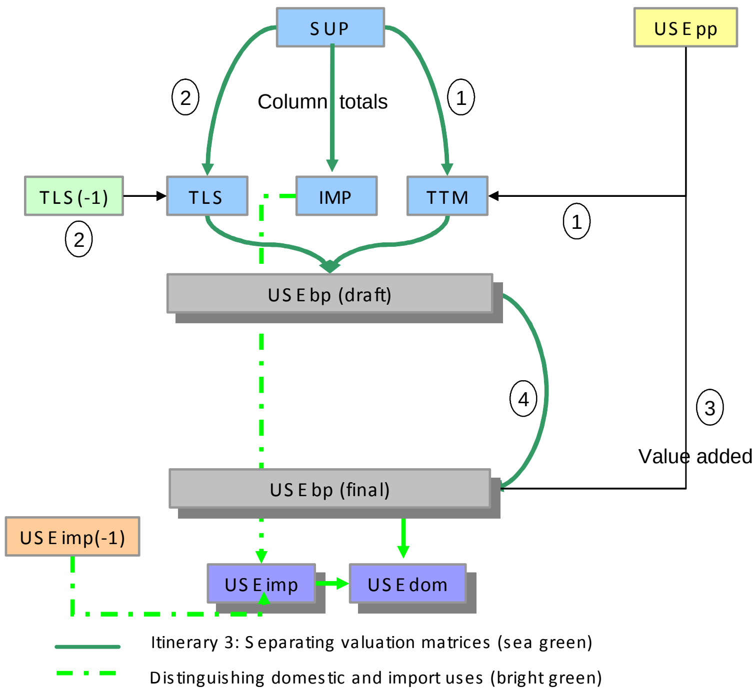
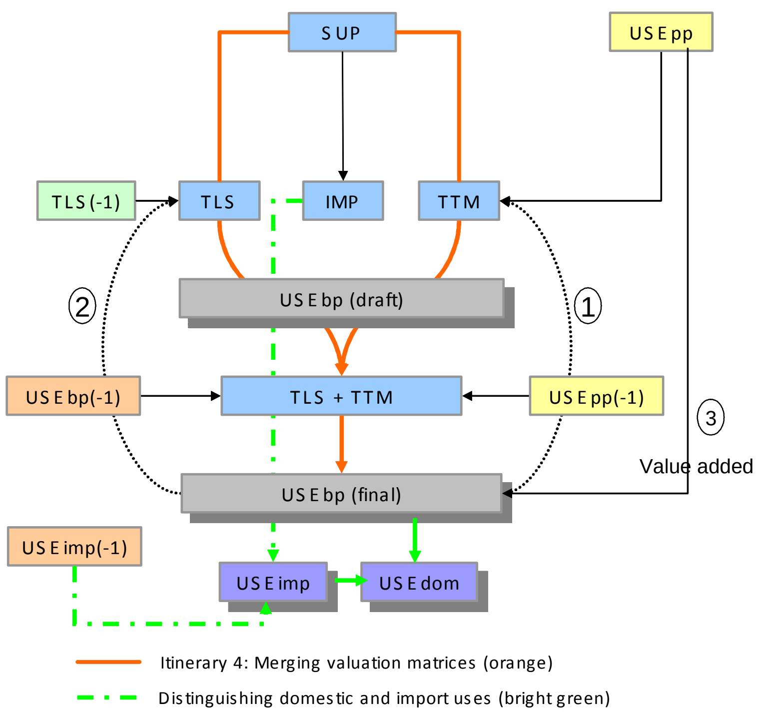


Figure 2.8: Data flowchart – Incomplete data situation (Itinerary 4)

Incomplete data situation – As an example of Itinerary 4

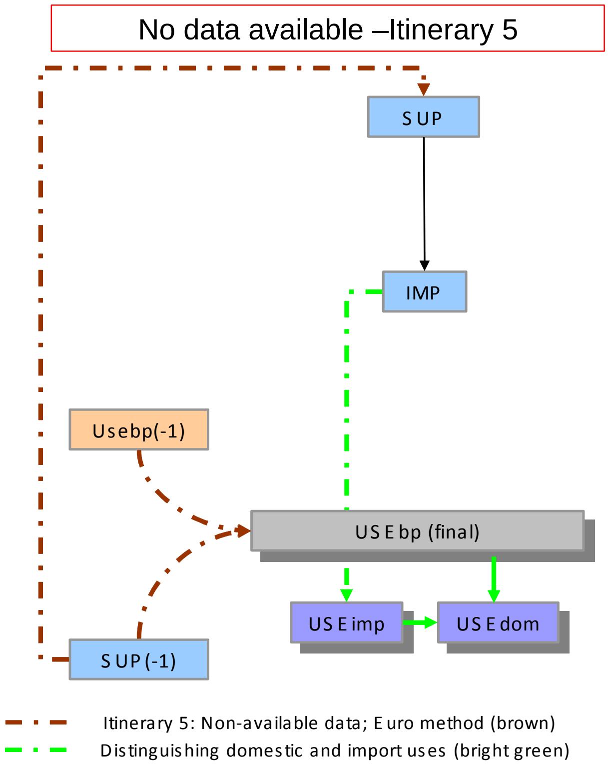


2.2.5. *No data available*

Any useful information from previous years must be used. However, if the affected country might not significantly impact the European totals, a neighbouring/similar country could be used.

Whenever no data on Supply and Use tables (the latter at purchasers' prices) were available for one certain year, the project opted for an updating procedure to expand the time series of annual Supply and Use tables and Input-Output tables. To this purpose, the project followed a modified version of the so called Euro method[6], which uses official macroeconomic forecasts as exogenous input for the iterative processes. While the standard Euro method was oriented to symmetric Input-Output tables, the modified version is actually oriented to updating Supply and Use tables. The projection method avoids the shortcomings of other projection methods like the RAS procedure, the model of double proportional patterns, the Lagrange method, the least squares method and the minimization approach (see Eurostat, 2008 for details on the methods). The Euro method corresponds to the basic idea of the RAS approach but avoids its standard shortcomings. Concerning the data availability to make the projections, it may happen not all sets of tables will be in stock but only sectoral data at the level of A31 classification will be available for one single year. Hence, not only data on final demand and gross value added by sectors will have to be broken down into the A60 classification by using reasonable assumptions but data from other years will have to be projected using these estimations.

Figure 2.9: Data flowchart - no data available – Itinerary 5



[6] See Eurostat (2008) Manual of Supply, Use and Input-Output Tables, §14.4.4 page 461. The method was originally developed by Beutel (2002).

2.2.6. Overview of methods

Finally, Table 2.2 shows for each country and year the kind of situation we have faced for the compilation of the full time series of Supply and Use tables at basic prices for the EU27 Member States. The Tables in the Annex 1 provide the details. Table 2.2 evidently shows that the years 2000 and 2005 are notably much richer in information than the years in between, mainly because of the official transmission of the symmetric Input-Output tables on a five-year basis.

Table 2.2: Situation of countries

	Country	2000	2001	2002	2003	2004	2005	2006
AT	Austria	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
BE	Belgium	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Non available
BG	Bulgaria	Incomplete	Incomplete	Excellent	Excellent	Incomplete	Non available	Non available
CY	Cyprus	Incomplete	Non available	Non available	Non available	Non available	Non available	Non available
CZ	Czech Republic	Satisfactory	Incomplete	Incomplete	Incomplete	Incomplete	Excellent	Excellent
DK	Denmark	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
EE	Estonia	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
FI	Finland	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
FR	France	Good	Good	Good	Good	Good	Good	Good
DE	Germany	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
GR	Greece	Good	Non available	Incomplete	Incomplete	Incomplete	Good	Incomplete
HU	Hungary	Excellent	Non available	Incomplete	Incomplete	Incomplete	Excellent	Incomplete
IE	Ireland	Good	Incomplete	Incomplete	Incomplete	Incomplete	Good	Incomplete
IT	Italy	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
LV	Latvia	Non available	Non available	Non available	Non available	Incomplete	Non available	Non available
LT	Lithuania	Excellent	Incomplete	Incomplete	Incomplete	Incomplete	Good	Incomplete
LU	Luxembourg	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
MT	Malta	Incomplete	Incomplete	Non available	Non available	Non available	Non available	Non available
NL	Netherlands	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent	Excellent
PL	Poland	Good	Incomplete	Incomplete	Incomplete	Incomplete	Good	Incomplete
PT	Portugal	Excellent	Incomplete	Incomplete	Incomplete	Incomplete	Excellent	Incomplete
RO	Romania	Excellent	Non available	Non available	Excellent	Excellent	Excellent	Excellent
SK	Slovakia	Excellent	Incomplete	Incomplete	Incomplete	Incomplete	Excellent	Incomplete
SI	Slovenia	Excellent	Excellent	Excellent	Excellent	Incomplete	Excellent	Incomplete
ES	Spain	Excellent	Excellent	Excellent	Excellent	Excellent	Good	Excellent
SE	Sweden	Good	Incomplete	Incomplete	Incomplete	Incomplete	Good	Incomplete
UK	United Kingdom	Incomplete	Incomplete	Incomplete	Incomplete	Excellent	Excellent	Excellent

EXCELLENT	16	11	12	13	12	16	12
GOOD	5	1	1	1	1	7	1
SATISFACTORY	1	0	0	0	0	0	0
INCOMPLETE	4	10	10	10	12	0	9
NON AVAILABLE	1	5	4	3	2	4	5

2.3. Towards the consolidated EU27 and Euro Area SUT tables

The output of the steps described in 2.1 and 2.2 is a simple aggregation of the national Supply and Use tables at basic prices for each year. This simple aggregation was done for the EU27 and the EMU17.

As a final step in the whole process, it was foreseen to adjust the simply-aggregated SUTs that minor bi-proportional adjustments should be made to the final consolidated EU27 and euro area tables in order to meet those updated industry totals provided by the ESA Sector Accounts but only if the deviations would be greater than 1%.

Table 3.3 shows main GDP components and compares the numbers published under the ESA Sector Accounts with the numbers as in the SUTs. Fortunately, the differences are below 1% and it was decided to not further adjust the SUTs.

Table 2.3: Comparison of main GDP-components – ESA Sector Accounts vs. Supply and Use Tables

	2006	2005	2004	2003	2002	2001	2000
Main GDP components	Millions of euro (from 1.1.1999)/Millions of ECU (up to 31.12.1998)						
as published in ESA sector accounts:							
Final consumption expenditure	9 199 232	8 771 623	8 386 687	8 020 172	7 859 215	7 556 104	7 233 714
Gross capital formation	2 468 392	2 237 722	2 118 725	1 984 488	1 951 882	1 969 818	1 964 378
Gross value added (at basic prices)	10 432 666	9 896 187	9 509 816	9 070 034	8 920 625	8 590 906	8 227 039
Taxes less subsidies on products	1 278 344	1 186 169	1 118 169	1 059 545	1 040 435	1 007 482	991 264
Main GDP components	Millions of euro (from 1.1.1999)/Millions of ECU (up to 31.12.1998)						
as in the Supply and Use Tables							
Final consumption expenditure (Use table)	9 204 513	8 775 816	8 394 892	8 003 635	7 852 421	7 549 982	7 230 534
Gross capital formation (Use table)	2 461 051	2 232 304	2 112 698	1 959 272	1 930 160	1 949 238	1 943 265
Value added at basic prices (Use table)	10 405 783	9 876 433	9 488 261	8 992 300	8 857 692	8 533 587	8 172 152
Taxes less subsidies onproducts (Use table)	1 269 538	1 181 920	1 112 290	1 059 603	1 033 491	1 001 957	992 721
Differences in %							
Final consumption expenditure	0.1%	0.0%	0.1%	-0.2%	-0.1%	-0.1%	0.0%
Gross capital formation	-0.3%	-0.2%	-0.3%	-1.3%	-1.1%	-1.0%	-1.1%
Value added at basic prices	-0.3%	-0.2%	-0.2%	-0.9%	-0.7%	-0.7%	-0.7%
Taxes less subsidies onproducts	-0.7%	-0.4%	-0.5%	0.0%	-0.7%	-0.5%	0.1%

The simply-aggregated SUTs require further processing; in particular the trade has to be corrected as intra-EU trade becomes ordinary domestic inter-industry flows. The processing steps from the simply-aggregated to the fully consolidated SUTs are described in the next chapter.

3. CONSOLIDATION OF NATIONAL SUPPLY AND USE TABLES FOR EU27 (AND EMU) (BALANCING OUT INTRA-EU/EMU-TRADE)

3.1. Introduction

At this stage the individual country use tables have been aggregated together into one EU table, which consists of simple sum of (1) all domestic use tables, (2) all intra-EU import tables, and (3) all extra-EU import tables, including the respective final use categories. Note that also the exports are split into intra-EU and extra-EU exports. A simplified graphical representation of this EU use table is given in Figure 3.1.

Figure 3.1: Scheme of aggregated EU Use table

domestic intermediate use	**domestic final demand**	**1**	**2**
intra-EU import use	**intra-EU import final demand**	**3**	**4**
extra-EU import use	**extra-EU import final demand**	**5**	**6**

Legend for Figure 3.1

Numbers refer to the columns in Figure 3.1.

1: exports to intra-EU countries

2: exports to extra-EU countries

3: transit trade – imported from intra-EU, exported to intra-EU

4: transit trade – imported from intra-EU, exported to extra-EU

5: transit trade – imported from extra-EU, exported to intra-EU

6: transit trade – imported from extra-EU, exported to extra-EU

Due to the change in geographical detail from individual EU member countries to the EU level, the former international trade flows between member countries now have to be interpreted as domestic transactions of the EU economy. At this point the intra-EU imports are still represented separately (the grey area), although at the level of the entire EU economy these flows are now domestic transactions. The same holds for intra-EU exports, column 1 in Figure 3.1.

In order to merge the intra-EU trade flows with the domestic transactions table with the sum of purely domestic transactions a procedure consisting of seven steps has to be undertaken. The main objective is to balance the intra-EU import table with the information on intra-EU exports. The procedure allows the table to be merged without violating the accounting identities that reign supply-use frameworks. The fact that the reported intra-EU imports per product do not match the reported intra-EU exports for each product is due to a number of issues; see Box 3.1, Mirror trade statistics puzzle.

Box 3.1: Mirror trade statistics puzzle

Each trade flow is reported by two countries. One of the reporters is the exporting country and the other reporter is the importing country. The two values representing exactly the same trade flow usually do not (fully) match. This observation is referred to as the *mirror trade statistics puzzle*.

The discrepancy between the values is partially due to a structural difference between the values; exporting countries usually report their exports in free-on-board prices whereas importing countries report their imports in cost-insurance-freight prices. (Section 2.13 p. 18 of Eurostat, 2006). The difference between these two prices is made up of the international trade and transport margins that are added to the price of a good (or service) when traded across national borders. In free-on-board prices the trade and transit services exported are recorded in the rows pertaining to the service sectors. In cost-insurance-freight prices, the trade and transit margins used to transport the goods are included in the prices of the good and are not present anymore in the rows pertaining to the service sectors. Part of the trade and transport margins included in imported goods from country *R* by country *S*, will balance against the trade and transport margins recorded as exports to country *S* by country *R*. A discrepancy will remain in case foreign carriers deliver the trade and transport services.

Additional explanations for the difference between export and import values are methodological differences, time lags, statistical confidentiality, different practices in the treatment of revisions and currency conversion issues.

For more information please consult section 2.17, pp. 20 – 23, Eurostat, 2006. Information on a range of underlying issues determining the quality of external trade statistics can be found in Eurostat, 2010.

A structural discrepancy is caused by the difference in valuation as imports are valued in cost-insurance-freight prices, while the exports in the aggregated table are recorded in basic prices. In order to merge the intra-EU import table and the domestic table, both need to be valued in the same prices. As the domestic table is in basic prices, the information on intra-EU exports in basic prices is used to balance the intra-EU import table. See Table 3.1 for the valuation layers of prices of goods and services traded internationally.

Note that there are three valuation layers between exports in basic prices and imports in cost-insurance-freight prices: (1) taxes less subsidies levied in the country of export, (2) trade and transport margins for transportation in the country of export, and (3) international trade and transport margins for the transport from the border of the exporting country to the border of the importing country (see Table 3.1).

Table 3.1: Valuation layers in international trade

Country	International trade (exports by R/imports by S)
R	**Exports by R in basic prices (of R)**
R	+ Valuation layer: taxes and subsidies
R	+ Valuation layer: trade and transport
R	***= Exports f.o.b. R***
International	+ Valuation layer: international trade and transport margins
S	***= Imports c.i.f. S***
S	+ Valuation layer: taxes and subsidies
S	+ Valuation layer: trade and transport
S	**Imports by S in purchaser prices (of S)**

3.2. Description of steps taken to arrive at a consolidated EU use table

Point of departure is the simply summed up EU Use table (see STEP0).

STEP0

Initial Use Table (simple sum) with unbalanced bilateral trade

	OUTPUT OF INDUSTRIES (NACE)	Total	Final consumption expenditure	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Final uses	Total uses at basic prices
Products								
Domestic uses								
Products	USEimp intra-EU							
Imports intra-EU								
Products	USEimp extra-EU							
Imports extra-EU								
Taxes less subsidies on products					TLS_Xintra	TLS_Xextra		
Total intermediate consumption								
Value added at basic prices								
Output at basic prices								

Initial Supply Table (simple sum)

	OUTPUT OF INDUSTRIES (NACE)	Total	intra-EU imports	extra-EU imports	Total supply
Products					
Total supply					

Box 3.2 gives an overview of the steps taken to a consolidated EU use table. The first step of the procedure corrects for the taxes less subsidies levied in the country of exports, which are incorporated in the value of imports. The second, third and fourth steps adjust the intra-EU and extra-EU import matrices or the intra-EU and extra-EU export matrices to correct for the double-counting of transit trade flows. In the fifth step all values of the intra-EU import matrix are rescaled to match the total of the intra-EU export vector – a requirement in order to be able to balance the intra-EU import matrix with the values of the intra-EU export vector. In the sixth step the matrix is balanced using the GRAS algorithm, which effectively redistributes trade and transport margins from the goods in which value they were included to the rows representing the trade and transport services. The final step consists of merging the

balanced intra-EU import table with the domestic table. These steps will be described in more detail below and are further explained via a numerical example in Annex 3.

Box 3.2: Overview of steps taken to arrive at the consolidated EU Use table at basic prices

Step 1: adjust for taxes less subsidies on intra-EU imports

--- Steps 2 to 4 correct for double counting of transit trade within the EU ---

Step 2: correct for trade flows imported from intra-EU, exported to extra-EU

Step 3: correct for trade flows imported from extra-EU, exported to intra-EU

Step 4: correct for trade flows imported from intra-EU, exported to intra-EU

Step 5: re-scale all import values in order to impose that total intra-EU imports equal total intra-EU exports

Step 6: balance the intra-EU import table with the intra-EU export vector using GRAS

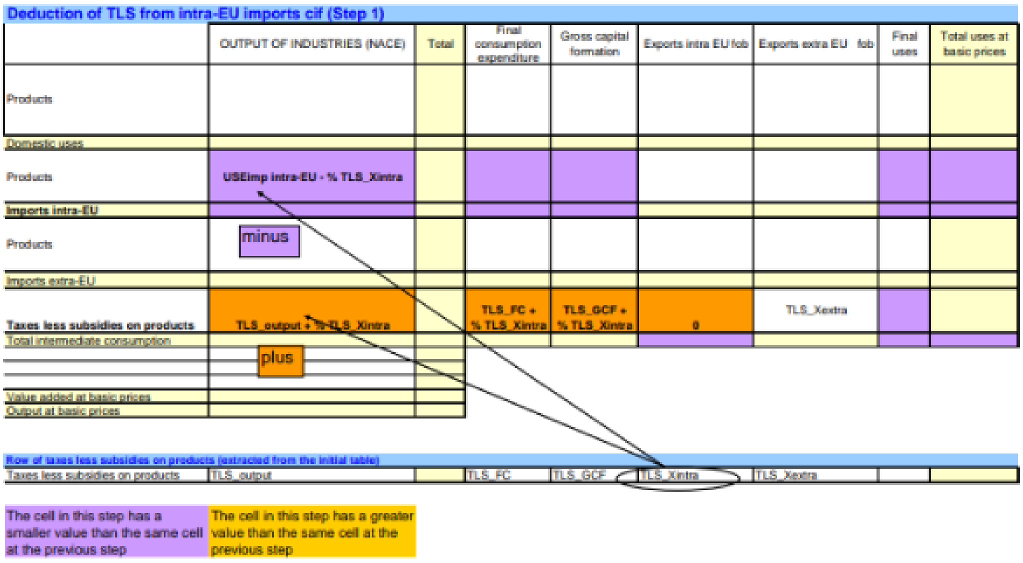
Step 7: aggregate the domestic and balanced intra-EU tables to arrive at the consolidated Use table at basic prices

Step 1: adjust for taxes less subsidies on intra-EU imports

The value recorded as total taxes less subsidies on intra-EU exports (in the row of taxes less subsidies and the column of intra-EU exports) is distributed over the exporting EU industries using the share of each industries' taxes less subsidies in total taxes less subsidies on intermediate demand and final demand excluding exports. The value is added to the respective industry and final demand category in the row of taxes less subsidies.

To keep total outputs by industry unchanged the values of the taxes less subsidies assigned to each industry are deducted from their intra-EU imports in the same proportion as their intermediate import input structure and final use structure per final demand category.

STEP1



Step 2: correct for trade flows imported from intra-EU and re-exported to extra-EU

Column **4** in Figure 3.1 records imports from intra-EU by EU countries, which are also recorded as exports by the original EU exporting country. The original exporters are unaware that the importing country actually re-exports the goods and services and record the trade as regular exports to an EU country. As these exports are re-exported to a country outside the EU, the original recording as exports to an EU country is incorrect.

From which country these flows originate is unknown, so no correction can be made at the individual country level, unless additional data is available on the origin of the transit trade recorded by each country. At the EU level this correction is possible, because the sum of all individual country transit trade columns matches the level of information needed to do this correction.

Column **4** gives exactly the information on how much of the exports recorded as exports to EU countries are in fact exports to non EU countries. The values present in column **4** therefore need to be subtracted from the column with intra-EU exports (column **1**) and added to the column with extra-EU exports (column **2**). In other words, a shift has to be made from intra-EU exports to extra-EU exports of the magnitude recorded in column **4**.

STEP2

Transit trade: from EU to RoW (Step 2)

	OUTPUT OF INDUSTRIES (NACE)	Total	Final consumption expenditure	Gross capital formation	**Exports intra EU fob**	**Exports extra EU fob**	Final uses	Total uses at basic prices
Products					**Xintra - Imports_Xextra**	**Xextra + Imports_Xextra**		
Domestic uses								
Products						**0**		
Imports intra-EU						**0**		
Products					minus	plus		
Imports extra-EU								
Taxes less subsidies on products					**0**			
Total intermediate consumption								
Value added at basic prices								
Output at basic prices								

Matrix of intra-EU imports (extracted from the initial table)

	OUTPUT OF INDUSTRIES (NACE)	Total	Final consumption expenditure	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Final uses	Total uses at basic prices
Products								
Imports intra-EU						**Imports_Xextra**		

Step 3: correct for trade flows imported from extra-EU and re-exported to intra-EU

Column **5** contains information on the imports from extra-EU countries that are exported to countries in the EU. The final importer countries record trade flows from EU countries while these are actually imported from countries outside the EU. The correction therefore entails reducing the reported imports from EU countries and increasing the reported imports from countries outside the EU. The values in the column are proportionally distributed over the values of the intra-EU import table. For each import value defined by product and industry, that products' import share in total imports (intermediate imports plus final demand imports except re-exports) multiplied by the re-export value is subtracted from the intra-EU import value and added to the extra-EU import value. This implies decreasing the intra-EU import values and increasing the extra-EU import values by exactly the same value per product, per importing industry or final demand category.

STEP 3

Transit trade: from RoW to EU (Step 3)

BEFORE

	OUTPUT OF INDUSTRIES (NACE)	Total	Final consumption expenditure	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Final uses	Total uses at basic prices
Products								
Domestic uses								
Products	USEimp intra EU		FC intra EU	GCF intra EU		0		
Imports intra-EU						0		
Products	USEimp extra EU		FC extra EU	GCF extra EU				
Imports extra-EU					Imports_Xextra			
Taxes less subsidies on products					0			
Total intermediate consumption								
Value added at basic prices								
Output at basic prices								

AFTER

	OUTPUT OF INDUSTRIES (NACE)	Total	Final consumption expenditure	Gross capital formation	**Exports intra EU fob**	Exports extra EU fob	Final uses	Total uses at basic prices
Products								
Domestic uses								
Products minus	USEimp intra EU - % Imports_Xextra		FC intra EU - % Imports_Xextra	GCF intra EU - % Imports_Xextra				
Imports intra-EU								
Products plus	USEimp extra EU+ % Imports_Xextra		FC extra EU + % Imports_Xextra	GCF extra EU + % Imports_Xextra	**0**			
Imports extra-EU					**0**			
Taxes less subsidies on products					0			
Total intermediate consumption								

Step 4: correct for trade flows imported from intra-EU and re-exported to intra-EU

The imports in column **3** are recorded by the original exporting country as exports to intra-EU countries. Both the exporting country and the importing country record these trade flows in the correct way, so no adjustment has to be made. Maintaining these values would result in double counting as the values are already included in the values reported by the original exporting county and the final importing country. Therefore, the values in this column are deleted.

Note that transit trade column **6**; imports from extra-EU countries exported to extra-EU countries, is maintained in the same form in the consolidated table. Both the original exporting country and the final importing country are non-EU countries. This information cannot be used for adjustments in the consolidated EU table.

STEP4

Transit trade: from EU to EU (Step 4)

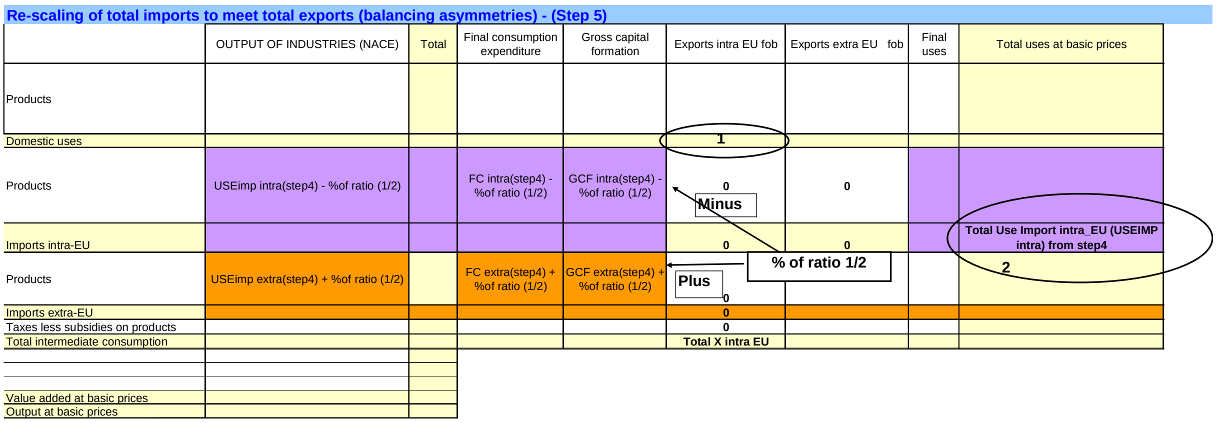
	OUTPUT OF INDUSTRIES (NACE)	Total	Final consumption expenditure	Gross capital formation	**Exports intra EU fob**	Exports extra EU fob	Final uses	Total uses at basic prices
Products								
Domestic uses								
Products					0	0		
Imports intra-EU					0	0		
Products					0			
Imports extra-EU					0			
Taxes less subsidies on products					0			
Total intermediate consumption								
Value added at basic prices								
Output at basic prices								

Step 5: re-scale all import values in order to impose that total intra-EU imports equal total intra-EU exports

At the product level, intra-EU imports and intra-EU exports need to match. This implies that each of the row sums of the intra-EU import table (without the columns for re-exports, which at this step have both been set to zero) have to match the values reported in the intra-EU export column. The intra-EU import table is colored grey in the figure, and the intra-EU export column is column number **1**. The procedure to achieve the matching of the intra-EU imports and intra-EU exports is performed in the next step. However, to undertake this procedure, it is required that the overall total of the intra-EU import table is equal to the total of the intra-EU export factor. To achieve this all values in the intra-EU import table are rescaled by multiplying each intra-EU import value by the sum of the intra-EU export values, divided by the overall sum of the intra-EU import table, including intermediate and final demand categories, without re-exports. The rescaling factor for the EU tables for 2000 up to and including 2006 is on average 1.10, with all values within a 0.02 positive or negative deviation from this value. This means that the total intra-EU export value is on average 10% higher than the total intra-EU import value reported.

The intra-EU trade discrepancy that is due to valuation differences and statistical errors (see Box 3.1: Mirror trade statistics puzzle) is offset against the extra-EU imports. The difference between the original intra-EU import values and the rescaled intra-EU import values is added to the corresponding value in the extra-EU import table (per product imported and importing industry or final demand category).

STEP5



Step 6: balance the intra-EU import table with the intra-EU export vector using GRAS

By using the export values in basic prices as row constraint in the GRAS procedure, the trade and transport margins included in the import c.i.f. values are effectively redistributed to the rows which the corresponding services. (For more information on this procedure see Box 3.3: GRAS) The intra-EU export column **1,** used as constraint in the GRAS procedure, is in basic prices. Therefore, the balanced intra-EU import use table is also in basic prices.

STEP6

GRAS procedure has been run (step 6)

	OUTPUT OF INDUSTRIES (NACE)	Total	Final consumption expenditure	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Final uses	Total uses at basic prices
Products					USE X_intra			
Domestic uses								
Products	Adjustments to fit TOTAL USES		Adjustments to fit TOTAL USES	Adjustments to fit TOTAL USES	0	0		Import intra_EU
Imports intra-EU					0	0		
Products					0			
Imports extra-EU					0			
Taxes less subsidies on products					0			
Total intermediate consumption					0			
Value added at basic prices								
Output at basic prices								

EQUALITY PER PRODUCT LINE

Box 3.3: Generalised RAS (GRAS)

The generalized RAS method is used to balance the intra-EU import totals per product with the intra-EU exports. (GRAS, Junius & Oosterhaven, 2003) It is a bi-proportional adjustment method very similar to RAS with the difference that it can deal with negative values in the same fashion it uses the information of the positive values. The method is fully mechanical, i.e. no ad hoc decisions have to be made. Its solution is equivalent to adding minimum information to the old table such that it just satisfies the new totals (see Bacharach, 1970, for an extensive treatment). Its origins are discussed in Lahr & Mesnard, 2004 in the special issue of *Economic Systems Research* on Biproportional Techniques in Input-Output Analysis. GRAS can be applied to any table for which an initial structure is given (or assumed), and new row and column totals are supplied, provided that the total of the row totals and the total of the column totals are equal. It has been widely used to update input-output tables for example by Stone, 1961. (See also Miller & Blair, 2009). In addition, it can be used to balance the derived import and export data matrices with the original total import and export data from the IOT (Linden, J. A. van der & Oosterhaven, 1995 and Oosterhaven, Stelder, & Inomata, 2008).

Step 7: aggregate the domestic and balanced intra-EU tables to arrive at the consolidated Use table at basic prices

In the last step the balanced intra-EU trade flows are added to the table with the simple aggregation of the domestic EU flows. Each value of the balanced intra-EU import table (per product and sector or final demand category except exports) is added to its corresponding value in the EU domestic table.

3.3. Concluding remarks

- Due to merging the intra-EU trade flows with the domestic transactions, and the adjustment for incorrect or double recordings of transit trade, export and import values in the consolidated table only concern extra-EU trade.
- The balance of total demand and total supply and the balance of total input and total output of the SUTs is maintained in the consolidated table. Intra-EU export values and intra-EU import values are merged with the domestic transactions. The difference between the balanced import use table and the unbalanced import use table is offset against the extra-EU trade flows.
- GDP for the EU is not altered by the method. The expenditure approach to calculate GDP entails summing household, non-profit institution and government consumption, gross capital formation (investment) and exports less imports. In the procedure, exports are decreased by the amount of intra-EU exports and imports are decreased by the amount of intra-EU imports, because these flows are merged with the domestic transactions. As both exports and imports decrease by the same amount, the net values of exports less imports do not change.

By correcting for the transit trade as has been described in this document it is assumed that re-exports are not again re-exported by the “final” importer.

4. Adding environmental extensions and creating symmetric product-by-product IOTs (industry technology assumption)

4.1. Introduction

This part consists of two main steps for the aggregated EU27:

- Adding environmental extensions (EE) to the Supply and Use Tables (SUT);
- Creating Environmentally Extended symmetric Input Output table (EE IOT) from the EE SUT.

Points of departure are the consolidated SUTs (see naio) for which the following notations are used:

Supply Table

	Industries	Output	Imports	Supply
Products	V^T	q	m	q+m
Output	g^T			

$\mathbf{V^T}$	Supply matrix (product by industry)
q	Column vector of product output (products)
m	Column vector of imports (products)
$\mathbf{g^T}$	Row vector of industry output (industries)

Use Table

	Industries	Final demand	Total
Domestic products	U_d	Y_d	q
Imported products	U_m	Y_m	m
Value added	W		w
Total	g^T	y^T	

$\mathbf{U_d}$	Use matrix for intermediates - domestic production (product by industry)
$\mathbf{U_m}$	Use matrix for intermediates - imports (product by industry)
U	Use matrix for intermediates - domestic production and imports (product by industry)
$\mathbf{Y_d}$	Final demand matrix - domestic production (product by category)
$\mathbf{Y_m}$	Final demand matrix - imports (product by category)
Y	Final demand matrix - domestic production and imports (product by category)
W	Value added matrix (components by industry)
w	Column vector of value added (components)
$\mathbf{y^T}$	Row vector of final demand (categories)

4.2. Adding environmental extensions to the Supply-Use framework (EE SUT)

In this step, environmental extensions are added to the previously constructed Supply and Use tables in order to create an environmentally-extended supply use system.

The following scheme shows an integrated system of Supply and Use tables with the additional environmental extensions (next to the notations):

Integrated SU framework + environmental extensions

	Domestic products	Imported products	Industries	Final demand	Total
Domestic products			U_d	Y_d	q
Imported products			U_m	Y_m	m
Industries	V				g
Value added			W		w
Total	q^T	m^T	g^T	y^T	
Environm. extension			R	H	

V	Make matrix - transpose of supply matrix (industry by product)
q^T	Row vector of product output (products)
m^T	Row vector of imports (products)
g	Column vector of industry output (industries)
y	Column vector of final demand (products)
w^T	Row vector of value added (industries)
R	Environmental extensions - industries (env. ext. by industries)
H	Environmental extensions - direct of final demand categories (env. ext. by final demand category)

Environmental extensions were downloaded from Eurostat's online database (see Air Emissions Accounts env_ac_ainacehh). Extensions included the following eight types of air emissions by industries and private households:

- Carbon dioxide (CO_2)
- Nitrous oxide (N_2O)
- Methane (CH_4)
- Sulphur oxides (SOx)
- Nitrogen oxides (NOx)
- Ammonia (NH_3)
- Carbon monoxide (CO)
- Non-methane volatile organic compounds (NMVOC)

Emission data was downloaded for all NACE industries and households for the EU27 and the time period 2000-2006. As emission data was reported by industry, the data was appended to the Use table as additional inputs into the production sector.

4.3. Creating symmetric Input-Output tables (product-by-product) including environmental extensions (EE IOT)

The environmentally extended symmetric input-output table is represented in two formats (versions A and B).

Version A distinguishes domestically produced products from imported products. Also final use is separated accordingly.

Symmetric Input-Output table distinguishing use of domestic products from use of imports – product-by-product (Version A)

	Homogenous Prod. Branches	Final demand	Total
Domestic products	S_d	Y_d	q
Imported products	S_m	Y_m	m
Value added	E		w
Total	q^T	y^T	
Environm. extension	Z	H	

The second format (version B) for a symmetric input-output table is that with an intermediate matrix ***S*** and a final use matrix ***Y*** where imports and domestic products are merged together. Balance is maintained between domestic supply and use by including a negative import vector ***–m*** next to the final use matrix.

Symmetric Input-Output table merging domestic products and imports – product-by-product (version B)

	Homogenous Prod. Branches	Final demand	Imports (negative)	Total
Products	S	Y	-m	q
Value added	E			w
Total	q^T	y^T		
Environm. extension	Z	H		

S Matrix for intermediates - domestic production and imports (product by product)
S_d Matrix for intermediates - domestic production (product by product)
S_m Matrix for intermediates - imports (product by product)
E Value added matrix (components by homogenous branches)
Z Environmental extensions - homogenous production branches (env. ext. by product)

The symmetric product-by-product input-output tables are formed from the supply and use tables. A transformation matrix is calculated according to market shares. This market share matrix shows the relative amount of product output by each industry. The transformation matrix is then multiplied by the use matrix to give the symmetric input-output table. This transformation is that of the industry technology assumption to give product-by-product tables (see Box 4.1 and Model B, Eurostat 2008 Manual of Supply, Use and Input-Output Tables, p.349).

Box 4.1: Mathematical formulation of the industry technology assumption (Model B)

Adapted from *Eurostat Manual of Supply, Use and Input-Output Tables*

In the case of the industry technology, the transformation matrix is:

$T = (\mathrm{diag}(g))^{-1} V$

Hence intermediates, value added and environmental extensions of the product-by-product input-output table are:

$S = UT$

$S_d = U_d T$

$S_m = U_m T$

$E = WT$

$Z = RT$

5. CONDUCTING LEONTIEF-TYPE MODELLING

Calculation of the Leontief model and extending it by environmental (or other) parameters is a standard operation in input-output analysis (e.g. Miller and Blair, 2009).

First, an input-coefficient matrix $\boldsymbol{A}$ is calculated which shows for each homogenous production branch how much direct inputs (of other products) are needed to produce one unit of its typical product output.

In a second step, the Leontief matrix $\boldsymbol{L}$ is derived. The Leontief inverse shows how much direct and indirect requirements (inputs of other products) are needed in order to produce one unit of a product for final use.

In a third step, environmental extensions are added. Environmental input-coefficients $\boldsymbol{Z^A}$ are calculated which are then multiplied with the Leontief matrix. The resulting is termed multipliers; showing how much of a given environmental parameter is directly and indirectly required to produce one unit of a product for final use. Total requirements, or multipliers, are presented by emission type and product group. Multipliers are then multiplied by each destination of final demand to give the domestic or total upstream requirements for each product in each destination of final demand[7]. Direct emissions for households are allocated in addition to the household final demand category. Results are presented for the eight emissions types. The mathematical formulations are given in Box 5.1.

Two variants of environmentally extended Leontief models have been established in this project, depending on which version of the symmetric EE IOTs has been used (see section 4.3).

Version A (only domestic intermediates)

In version A, the coefficient matrix and subsequently the Leontief inverse are calculated from the domestic component of the symmetric input-output table such that only domestic transactions are included in the direct and indirect requirements. Total requirements, or multipliers, are presented by product group. This representation maintains data integrity of the multipliers (based only on statistical data) without the need for making assumptions on technology in trading partners, but necessarily ignores the import of products. The environmental repercussions of importing products rather than producing them domestically are hence ignored.

Version B (domestic and import intermediates)

In Version B, the coefficients matrix and subsequently the Leontief inverse are calculated from the total (domestic + import) components of the symmetric input-

[7] It has to be noted that in the Eurostat air emissions data set environmental extensions are provided for extra-territorial organizations and bodies (NACE rev1.1 division 99). This data should be allocated to industry sectors/final consumers in the extension data set. Currently it is left unallocated and thus uncounted; the order of magnitude is very small and can be neglected.

output table such that both domestic and imported transactions are included in the direct and indirect requirements. This representation assumes that trading partners have the same technology of production as domestically, and is commonly known as the "domestic technology assumption". The environmental repercussions of importing products are then captured, with the assumption that the same impact would occur in foreign locations per dollar of production as that which occurs locally.

Box 5.1: Mathematical formulation of calculation of the Leontief inverse

Input coefficient matrices are derived by dividing the columns of the intermediate ***S*** by the total domestic output of products ***q***.

$A = S(\mathrm{diag}(q))^{-1} = U(\mathrm{diag}(g))^{-1} V(\mathrm{diag}(q))^{-1}$

$A_d = S_d(\mathrm{diag}(q))^{-1} = U_d (\mathrm{diag}(g))^{-1} V(\mathrm{diag}(q))^{-1}$

where A_d is derived from the "domestic only" case (version A).

Leontief inverses are calculated from the above input coefficient matrices

$L = (I-A)^{-1}$

$L_d = (I-A_d)^{-1}$

Physical input coefficients are derived for the environmental extensions:

$Z^A = Z(\mathrm{diag}(q))^{-1} = R(\mathrm{diag}(g))^{-1} V(\mathrm{diag}(q))^{-1}$

Environmental multipliers are calculated according to:

$M = Z^A L$

$M_d = Z^A L_d$

Emissions embodied in final demand are calculated according to:

$E = M \cdot Y + H$

$E_d = M_d \cdot Y + H$

$E_m = E - E_d$

6. TECHNICAL DESCRIPTION OF DATA

This project employed and produced various data sets which are described in the following.

*Consolidated supply, use, and input-output tables (product*product) at basic prices* [naio]

The consolidated supply, use, and input-output tables (SUIOT) at basic prices form the basis for this project. On Eurostat's online database the following six tables are provided each for a 60 branches and an aggregated 6 branches format:

- Supply table
- Use table for domestic output
- Use table for imports
- Input-Output table
- Input-output table for domestic output
- Input-output table for imports

Each of the multi-dimensional tables has the following dimensions:

code	label	comments
TIME	Time	Currently, the tables are available for the time period 2000-2006. Date for the reference year 2007 will be added soon.
GEO	country or country grouping	Currently, these tables are available for two geographical aggregates: European Union (EU27) and Euro Area (EMU17).
UNIT	measurement unit	millions of Euro
T_ROWS	classification of rows for input-output tables	The classification of rows is based on NACE/CPA for the intermediate part. It further discerns the components of value added.
T_COLS	classification of columns for input-output tables	The classification of columns is based on NACE/CPA for the intermediate part. It further discerns the components of final use, and imports (supply table).

Air Emissions Accounts by activity (NACE industries and households) [env_ac_ainacehh]

Eurostat collects and publishes regularly air emissions by industries and private households (see). These are fully compatible with ESA national accounts data, namely supply, use, and input-output tables. In this project, these air emissions accounts have been used as environmental extensions for Leontief-type modelling.

The Air Emissions Accounts have the following dimensions:

code	label	comments
TIME	Time	Currently, the tables are available for the time period 1995-2006. Data for the reference years 2007-2009 will be added soon.
GEO	country or country grouping	These tables are available for the 27 memebr States of the European Union, Norway, and three European Union aggregates: EU27, EU25, EU15
UNIT	measurement unit	tonnes, 1000 tonnes
AI	Pollutants	The set includes three greenhouse gases (CO2, N2O, CH4) and five air pollutants (Nos, Sox, NH3, CO, NMVOC)
NACE_R1	Industries	NACE 2-digit divisions (and groupings thereof) plus households

Domestic and global emissions of greenhouse gases and air pollutants induced by final use of products – results from environmental input-output analysis [env_ac_io]

The previous air emissions accounts data have been fed into an environmental Leontief model in order to estimate the emissions "embodied" in final use of products. The resulting data set (multi-dimensional table) is provided on Eurostat's online database. The full-fledged name of the data set is "*Domestic and global emissions of greenhouse gases and air pollutants induced by final use of products – results from environmental input-output analysis*".

The results from the environmental input-output modelling have the following dimensions:

code	label	comments
TIME	Time	Currently, the tables are available for the time period 2000-2006. Date for the reference year 2007 will be added soon.
GEO	country or country grouping	Currently, these tables are available for two geographical aggregates: European Union (EU27) and Euro Area (EMU17).
UNIT	measurement unit	tonnes
AI	Pollutants	The set includes three greenhouse gases (CO2, N2O, CH4) and five air pollutants (Nos, Sox, NH3, CO, NMVOC)
CPA02	Products	The classification of products final used is based on the CPA 2002. Households are also included (source of direct emissions, e.g. from heating and private transport)
ORIGIN	Place of origin of emissions	This dimesion indicates where the estimated "embodied" emissions occur: they may occur domestically or in the rest of the world (both: globally).
T_COLS	classification of columns for input-output tables	The classification of columns is based on NACE/CPA for the intermediate part. It further discerns the components of final use.

ANNEX 1: DATA AVAILABILITY FOR YEARS 2000-2006

The following tables give an overview of the availability of various SUT and IOT and related tables at Eurostat for each EU member state, for a specific year.

Year 2000	Country	SUP	USEpp	SIOT	SIOTdom	SIOTimp	USEbp	Usedom	Useimp	TTM	TLS	Situation
AT	Austria	X	X	X	X	X	X	X	X	X	X	E
BE	Belgium	X	X	X	X	X	X	X	X	X	X	E
BG	Bulgaria	X	X									I
CY	Cyprus	X	X									I
CZ	Czech Republic	X	X	X								S
DK	Denmark	X	X	X	X	X	X			X	X	E
EE	Estonia	X	X	X	X	X	X	X	X	X	X	E
FI	Finland	X	X	X	X	X	X	X	X			E
FR	France	X	X	X	X	X						G
DE	Germany	X	X	X	X	X	X	X	X	X	X	E
GR	Greece	X	X	X	X	X						G
HU	Hungary	X	X	X	X	X	X	X	X			E
IE	Ireland	X	X	X	X	X		X				G
IT	Italy	X	X	X	X	X	X	X	X	X	X	E
LV	Latvia											N
LT	Lithuania	X	X	X	X	X	X	X	X	X	X	E
LU	Luxembourg	X	X	X			X			X	X	E
MT	Malta	X	X									I
NL	Netherlands	X	X	X	X	X	X	X	X	X	X	E
PL	Poland	X	X	X	X	X						G
PT	Portugal	X	X				X			X	X	E
RO	Romania	X	X	X	X	X	X			X	X	E
SK	Slovakia	X	X	X	X	X	X	X	X	X	X	E
SI	Slovenia	X	X	X	X	X	X	X	X			E
ES	Spain	X	X	X	X	X	X	X	X			E
SE	Sweden	X	X	X	X	X						G
UK	United Kingdom	X	X									I

Year 2001	Country	SUP	USEpp	SIOT	SIOTdom	SIOTimp	USEbp	Usedom	Useimp	TTM	TLS	Situation
AT	Austria	X	X				X	X	X	X	X	E
BE	Belgium	X	X				X	X	X	X	X	E
BG	Bulgaria	X	X									I
CY	Cyprus											N
CZ	Czech Republic	X	X									I
DK	Denmark	X	X	X	X	X	X			X	X	E
EE	Estonia	X	X				X	X	X	X	X	E
FI	Finland	X	X	X	X	X	X	X	X			E
FR	France	X	X	X	X	X						G
DE	Germany	X	X	X	X	X	X	X	X	X	X	E
GR	Greece	X	X									N
HU	Hungary	X	X									N
IE	Ireland	X	X									I
IT	Italy	X	X				X	X	X	X	X	E
LV	Latvia											N
LT	Lithuania	X	X									I
LU	Luxembourg	X	X	X			X			X	X	E
MT	Malta	X	X									I
NL	Netherlands	X	X	X	X	X	X	X	X	X	X	E
PL	Poland	X	X									I
PT	Portugal	X	X									I
RO	Romania											N
SK	Slovakia	X	X									I
SI	Slovenia	X	X	X	X	X	X	X	X			E
ES	Spain	X	X				X	X	X			E
SE	Sweden	X	X									I
UK	United Kingdom	X	X									I

Year 2002	Country	SUP	USEpp	SIOT	SIOTdom	SIOTimp	USEbp	Usedom	Useimp	TTM	TLS	Situation
AT	Austria	X	X				X	X	X	X	X	E
BE	Belgium	X	X				X	X	X	X	X	E
BG	Bulgaria	X	X							X	X	E
CY	Cyprus											N
CZ	Czech Republic	X	X									I
DK	Denmark	X	X	X	X	X	X			X	X	E
EE	Estonia	X	X				X	X	X	X	X	E
FI	Finland	X	X	X	X	X	X	X	X			E
FR	France	X	X	X	X	X						G
DE	Germany	X	X	X	X	X	X	X	X	X	X	E
GR	Greece	X	X									I
HU	Hungary	X	X									I
IE	Ireland	X	X									I
IT	Italy	X	X				X	X	X	X	X	E
LV	Latvia											N
LT	Lithuania	X	X									I
LU	Luxembourg	X	X	X			X			X	X	E
MT	Malta											N
NL	Netherlands	X	X	X	X	X	X	X	X	X	X	E
PL	Poland	X	X									I
PT	Portugal	X	X									I
RO	Romania											N
SK	Slovakia	X	X									I
SI	Slovenia	X	X				X	X	X			E
ES	Spain	X	X				X	X	X			E
SE	Sweden	X	X									I
UK	United Kingdom	X	X									I

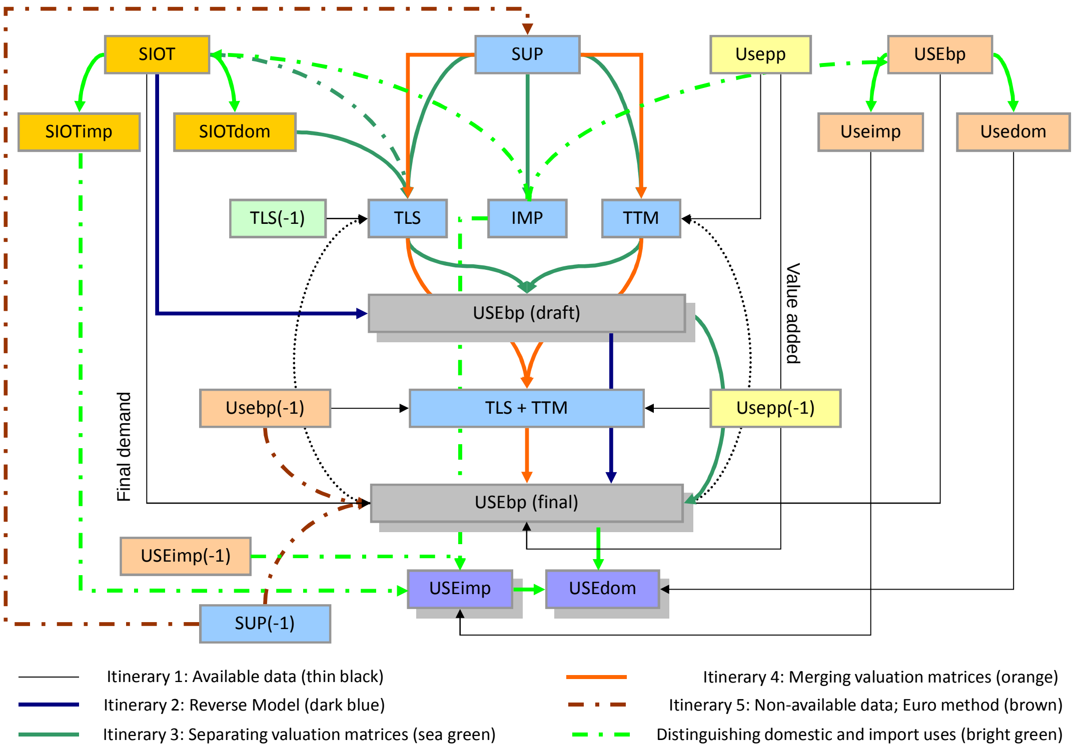
Year 2003	Country	SUP	USEpp	SIOT	SIOTdom	SIOTimp	USEbp	Usedom	Useimp	TTM	TLS	Situation
AT	Austria	X	X				X	X	X	X	X	E
BE	Belgium	X	X				X	X	X	X	X	E
BG	Bulgaria	X	X							X	X	E
CY	Cyprus											N
CZ	Czech Republic	X	X									I
DK	Denmark	X	X	X	X	X	X			X	X	E
EE	Estonia	X	X				X	X	X	X	X	E
FI	Finland	X	X	X	X	X	X	X	X			E
FR	France	X	X	X	X	X						G
DE	Germany	X	X	X	X	X	X	X	X	X	X	E
GR	Greece	X	X									I
HU	Hungary	X	X									I
IE	Ireland	X	X									I
IT	Italy	X	X				X	X	X	X	X	E
LV	Latvia											N
LT	Lithuania	X	X									I
LU	Luxembourg	X	X	X			X			X	X	E
MT	Malta											N
NL	Netherlands	X	X	X	X	X	X	X	X	X	X	E
PL	Poland	X	X									I
PT	Portugal	X	X									I
RO	Romania	X	X	X	X	X						E
SK	Slovakia	X	X									I
SI	Slovenia	X	X				X	X	X			E
ES	Spain	X	X				X	X	X			E
SE	Sweden	X	X									I
UK	United Kingdom	X	X									I

Year 2004	Country	SUP	USEpp	SIOT	SIOTdom	SIOTimp	USEbp	Usedom	Useimp	TTM	TLS	Situation
AT	Austria	X	X				X	X	X	X	X	E
BE	Belgium	X	X				X	X	X	X	X	E
BG	Bulgaria	X	X									I
CY	Cyprus											N
CZ	Czech Republic	X	X									I
DK	Denmark	X	X	X	X	X	X			X	X	E
EE	Estonia	X	X				X	X	X	X	X	E
FI	Finland	X	X	X	X	X	X	X	X			E
FR	France	X	X	X	X	X						G
DE	Germany	X	X	X	X	X	X	X	X	X	X	E
GR	Greece	X	X									I
HU	Hungary	X	X									I
IE	Ireland	X	X									I
IT	Italy	X	X				X	X	X	X	X	E
LV	Latvia	X	X									I
LT	Lithuania	X	X									I
LU	Luxembourg	X	X	X			X			X	X	E
MT	Malta											N
NL	Netherlands	X	X	X	X	X	X	X	X	X	X	E
PL	Poland	X	X									I
PT	Portugal	X	X									I
RO	Romania	X	X	X	X	X				X	X	E
SK	Slovakia	X	X									I
SI	Slovenia	X	X									I
ES	Spain	X	X				X	X	X			E
SE	Sweden	X	X									I
UK	United Kingdom	X	X							X	X	E

Year 2005	Country	SUP	USEpp	SIOT	SIOTdom	SIOTimp	USEbp	Usedom	Useimp	TTM	TLS	Situation
AT	Austria	X	X	X	X	X	X	X	X	X	X	E
BE	Belgium	X	X	X	X	X	X	X	X	X	X	E
BG	Bulgaria											N
CY	Cyprus											N
CZ	Czech Republic	X	X	X	X	X	X	X	X			E
DK	Denmark	X	X	X	X	X	X			X	X	E
EE	Estonia	X	X	X	X	X	X	X	X	X	X	E
FI	Finland	X	X	X	X	X	X	X	X			E
FR	France	X	X	X	X	X						G
DE	Germany	X	X	X	X	X	X	X	X	X	X	E
GR	Greece	X	X	X	X	X						G
HU	Hungary	X	X	X	X	X	X	X	X			E
IE	Ireland	X	X	X	X	X						G
IT	Italy	X	X	X	X	X	X	X	X	X	X	E
LV	Latvia											N
LT	Lithuania	X	X	X	X	X		X				G
LU	Luxembourg	X	X	X			X			X	X	E
MT	Malta											N
NL	Netherlands	X	X	X	X	X	X	X	X	X	X	E
PL	Poland	X	X	X	X	X						G
PT	Portugal	X	X	X	X	X	X			X	X	E
RO	Romania	X	X	X	X	X	X			X	X	E
SK	Slovakia	X	X	X	X	X	X	X	X	X	X	E
SI	Slovenia	X	X	X	X	X	X	X	X			E
ES	Spain	X	X	X	X	X						G
SE	Sweden	X	X	X	X	X						G
UK	United Kingdom	X	X							X	X	E

Year 2006	Country	SUP	USEpp	SIOT	SIOTdom	SIOTimp	USEbp	Usedom	Useimp	TTM	TLS	Situation
AT	Austria	X	X				X	X	X	X	X	E
BE	Belgium											N
BG	Bulgaria											N
CY	Cyprus											N
CZ	Czech Republic	X	X				X	X	X			E
DK	Denmark	X	X	X	X	X	X			X	X	E
EE	Estonia	X	X				X	X	X	X	X	E
FI	Finland	X	X	X	X	X	X	X	X			E
FR	France	X	X	X	X	X						G
DE	Germany	X	X	X	X	X	X	X	X	X	X	E
GR	Greece	X	X									I
HU	Hungary	X	X									I
IE	Ireland	X	X									I
IT	Italy	X	X				X	X	X	X	X	E
LV	Latvia											N
LT	Lithuania	X	X									I
LU	Luxembourg	X	X	X			X			X	X	E
MT	Malta											N
NL	Netherlands	X	X	X	X	X	X	X	X	X	X	E
PL	Poland	X	X									I
PT	Portugal	X	X									I
RO	Romania	X	X	X	X	X				X	X	E
SK	Slovakia	X	X									I
SI	Slovenia	X	X									I
ES	Spain	X	X				X	X	X			E
SE	Sweden	X	X									I
UK	United Kingdom	X	X							X	X	E

ANNEX 2: DATA FLOWCHART, GENERAL OVERVIEW



ANNEX 3: NUMERICAL EXAMPLE OF AGGREGATION (CHAPTER 3)

In this project, the methodology for aggregating the country SUT to an EU27 SUT was subject to a significant methodological discussion. Ultimately, the approach was developed as described in chapter 3, mainly by Maaike C. Bouwmeester and Jan Oosterhaven (RuG), José M. Rueda Cantuche (JRC-IPTS), and Joerg Beutel (Konstanz University of Applied Sciences). The tables in this annex give a numerical example of the approach (6 industries by 6 products format). This numerical example was elaborated by José M. Rueda Cantuche.

In short, the following tables are shown:

a) Step 0: An unbalanced table, in which the SUT in basic prices for the aggregated EU economy is derived through simply summing up the 27 country SUTs (see procedure described in chapter 2).

b) Seven tables showing intermediate results after each of the 7 steps discussed in Chapter 3:

- Step 1: Deduction of Taxes less Subsidies on Products from intra-EU imports cif

- Step 2: Transit trade: from EU to Rest of the World

- Step 3: Transit trade: from Rest of the World to EU

- Step 4: Transit trade: from EU to EU

- Step 5: Re-scaling of total imports to meet total exports (balancing asymmetries)

- Step 6: GRAS results only (macro in external file)

- Step 7: Consolidated Use Table at basic prices

c) The resulting final EU27 SUT

Step 0: Initial Use table in basic prices (simple sum) with unbalanced bilateral trade

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

Initial Use Table (simple sum) with unbalanced bilateral trade

	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE)							FINAL USES												
		Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total uses
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, fo	45 485	176 399	1 567	11 266	1 386	4 879	240 981	66 830	9	501	67 340	5 141	362	5 503	28 572	11 439	40 011	112 854	353 835
2	Products from mining and	61 624	1 541 834	226 854	301 510	114 282	163 905	2 410 008	954 221	160	24 211	978 592	355 132	20 841	375 973	1 217 240	617 261	1 834 501	3 189 067	5 599 075
3	Construction work	2 555	31 861	161 391	29 687	79 956	34 811	340 262	34 905	0	2 850	37 755	771 091	115	771 206	4 865	2 029	6 894	815 855	1 156 117
4	Wholesale and retail trade	28 558	464 183	71 408	501 268	144 486	119 124	1 329 026	1 512 051	167	40 636	1 552 854	108 690	4 036	112 726	281 936	141 264	423 201	2 088 781	3 417 807
5	Financial intermediation s	15 980	464 284	108 057	426 239	891 079	198 442	2 104 080	1 121 001	4 644	45 646	1 171 291	185 857	1 857	187 713	128 724	86 962	215 685	1 574 690	3 678 770
6	Other services	5 376	49 205	4 842	41 168	65 667	163 938	330 196	487 951	119 036	1 672 587	2 279 574	15 547	268	15 815	11 067	10 167	21 235	2 316 624	2 646 820
7	Total national domestic u	159 578	2 727 764	574 120	1 311 137	1 296 856	685 098	6 754 554	4 176 960	124 016	1 786 432	6 087 407	1 441 459	27 478	1 468 937	1 672 404	869 123	2 541 527	10 097 871	16 852 425
8	Products of agriculture, fo	2 628	21 633	64	902	48	449	25 724	13 000	0	0	13 000	749	- 90	659	4 339	2 004	6 343	20 003	45 726
9	Products from mining and	15 467	668 239	52 976	75 654	22 287	43 064	877 686	313 306	59	9 784	323 149	206 534	8 970	215 504	265 933	94 569	360 502	899 155	1 776 841
10	Construction work	4	1 229	1 120	76	147	55	2 630	511	0	17	528	5 656	5	5 661	8	14	22	6 210	8 840
11	Wholesale and retail trade	3 691	66 596	8 065	78 492	9 892	10 722	177 459	112 402	4	2 853	115 259	9 988	456	10 444	5 120	13 406	18 525	144 228	321 687
12	Financial intermediation s	535	37 318	4 416	14 121	44 800	7 486	108 675	8 577	79	381	9 036	12 205	- 12	12 193	3 281	2 765	6 045	27 274	135 950
13	Other services	17	1 517	27	409	595	4 618	7 182	2 240	523	6 304	9 067	121	78	199	526	465	991	10 257	17 440
14	Total imports from EU co	22 341	796 532	66 667	169 653	77 769	66 393	1 199 356	450 036	666	19 338	470 040	235 252	9 407	244 660	279 206	113 222	392 429	1 107 128	2 306 483
15	Products of agriculture, fo	1 969	15 010	62	732	55	303	18 132	8 266	0	2	8 268	482	- 70	412	1 487	604	2 091	10 772	28 904
16	Products from mining and	4 835	333 541	20 083	29 967	10 546	22 350	421 320	144 458	21	3 821	148 300	113 819	9 121	122 940	61 413	46 655	108 068	379 308	800 628
17	Construction work	2	293	1 074	26	90	58	1 543	128	0	0	128	838	2	840	5	3	8	976	2 519
18	Wholesale and retail trade	182	11 511	711	20 389	3 486	1 513	37 792	7 900	0	121	8 022	1 766	- 2	1 763	887	1 577	2 464	12 249	50 041
19	Financial intermediation s	268	18 607	2 439	10 684	22 184	4 634	58 817	2 487	44	87	2 618	5 568	0	5 569	174	1 149	1 324	9 511	68 327
20	Other services	11	900	16	635	878	5 569	8 009	1 930	171	923	3 024	244	40	285	228	231	459	3 768	11 776
21	Total imports from third c	7 268	379 862	24 386	62 433	37 239	34 427	545 613	165 169	236	4 954	170 359	122 718	9 091	131 809	64 194	50 220	114 414	416 582	962 196
22	Taxes less subsidies on p	4 505	70 693	20 710	79 268	67 511	68 320	311 007	527 626	644	7 549	535 820	127 215	318	127 533	3 301	8 305	11 606	674 960	985 967
23	Total intermediate consur	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	2 019 106	1 040 870	3 059 976	12 296 541	21 107 070
24	Compensation of employe	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produ	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
3 059 976	+ Exports
-3 268 679	- Imports
9 027 862	= GDP

Initial Supply Table (simple sum)

	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE)									
		Agriculture, hunting, forestry and	Industry, including energy	Construction	Wholesale and retail trade; repair	Financial, real estate, renting and	Other activities	Total	intra-EU imports	extra-EU imports	Total supply
No		1	2	3	4	5	6	8	9	10	11
1	Products of agriculture, fo	348 357	2 349	79	2 076	15	960	353 835	45 726	28 904	428 466
2	Products from mining and	18 519	5 508 434	11 536	48 924	752	10 911	5 599 075	1 776 841	800 628	8 176 544
3	Construction work	1 996	15 068	1 111 392	13 884	4 794	8 982	1 156 117	8 840	2 519	1 167 475
4	Wholesale and retail trade	3 718	133 210	6 282	3 240 573	5 336	28 689	3 417 807	321 687	50 041	3 789 536
5	Financial intermediation s	2 497	44 068	9 811	86 893	3 496 619	38 883	3 678 770	135 950	68 327	3 883 047
6	Other services	1 712	78 443	3 640	37 104	6 728	2 519 194	2 646 820	17 440	11 776	2 676 036
7	Total supply	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425	2 306 483	962 196	20 121 104

Step 1: Deduction of Taxes less Subsidies from intra-EU imports

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

Deduction of TLS from intra-EU imports cif (Step 1)

	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE)							FINAL USES											
		Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total uses
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, fo	45 485	176 399	1 567	11 266	1 386	4 879	240 981	66 830	9	501	67 340	5 141	362	5 503	28 572	11 439	40 011	112 854	353 835
2	Products from mining and	61 624	1 541 834	226 854	301 510	114 282	163 905	2 410 008	954 221	160	24 211	978 592	355 132	20 841	375 973	1 217 240	617 261	1 834 501	3 189 067	5 599 075
3	Construction work	2 555	31 861	161 391	29 687	79 956	34 811	340 262	34 905	0	2 850	37 755	771 091	115	771 206	4 865	2 029	6 894	815 855	1 156 117
4	Wholesale and retail trade	28 558	464 183	71 408	501 268	144 486	119 124	1 329 026	1 512 051	167	40 636	1 552 854	108 690	4 036	112 726	281 936	141 264	423 201	2 088 781	3 417 807
5	Financial intermediation s	15 980	464 284	108 057	426 239	891 079	198 442	2 104 080	1 121 001	4 644	45 646	1 171 291	185 857	1 857	187 713	128 724	86 962	215 685	1 574 690	3 678 770
6	Other services	5 376	49 205	4 842	41 168	65 667	163 938	330 196	487 951	119 036	1 672 587	2 279 574	15 547	268	15 815	11 067	10 167	21 235	2 316 624	2 646 820
7	Total national domestic us	159 578	2 727 764	574 120	1 311 137	1 296 856	685 098	6 754 554	4 176 960	124 016	1 786 432	6 087 407	1 441 459	27 478	1 468 937	1 672 404	869 123	2 541 527	10 097 871	16 852 425
8	Products of agriculture, fo	2 626	21 627	64	901	48	447	25 712	12 948	0	0	12 949	747	- 90	658	4 339	2 004	6 343	19 950	45 662
9	Products from mining and	15 456	668 038	52 920	75 534	22 221	42 914	877 083	312 061	59	9 771	321 891	206 156	8 969	215 124	265 933	94 569	360 502	897 518	1 774 601
10	Construction work	4	1 228	1 119	75	146	55	2 627	509	0	17	526	5 645	5	5 651	8	14	22	6 198	8 825
11	Wholesale and retail trade	3 688	66 576	8 056	78 368	9 863	10 685	177 237	111 956	4	2 849	114 809	9 970	456	10 426	5 120	13 406	18 525	143 760	320 997
12	Financial intermediation s	534	37 307	4 411	14 099	44 668	7 460	108 479	8 543	78	380	9 001	12 182	- 12	12 170	3 281	2 765	6 045	27 217	135 696
13	Other services	17	1 516	27	408	594	4 602	7 163	2 231	521	6 296	9 048	121	78	199	526	465	991	10 238	17 401
14	Total imports from EU co	22 326	796 292	66 597	169 385	77 540	66 162	1 198 302	448 248	663	19 312	468 224	234 821	9 406	244 228	279 206	113 222	392 429	1 104 880	2 303 182
15	Products of agriculture, fo	1 969	15 010	62	732	55	303	18 132	8 266	0	2	8 268	482	- 70	412	1 487	604	2 091	10 772	28 904
16	Products from mining and	4 835	333 541	20 083	29 967	10 546	22 350	421 320	144 458	21	3 821	148 300	113 819	9 121	122 940	61 413	46 655	108 068	379 308	800 628
17	Construction work	2	293	1 074	26	90	58	1 543	128	0	0	128	838	2	840	5	3	8	976	2 519
18	Wholesale and retail trade	182	11 511	711	20 389	3 486	1 513	37 792	7 900	0	121	8 022	1 766	- 2	1 763	887	1 577	2 464	12 249	50 041
19	Financial intermediation s	268	18 607	2 439	10 684	22 184	4 634	58 817	2 487	44	87	2 618	5 568	0	5 569	174	1 149	1 324	9 511	68 327
20	Other services	11	900	16	635	878	5 569	8 009	1 930	171	923	3 024	244	40	285	228	231	459	3 768	11 776
21	Total imports from third c	7 268	379 862	24 386	62 433	37 239	34 427	545 613	165 169	236	4 954	170 359	122 718	9 091	131 809	64 194	50 220	114 414	416 582	962 196
22	Taxes less subsidies on p	4 520	70 933	20 780	79 536	67 740	68 552	312 061	529 414	646	7 575	537 635	127 646	319	127 965	0	8 305	8 305	673 906	985 967
23	Total intermediate consum	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	2 015 805	1 040 870	3 056 675	12 293 240	21 103 769
24	Compensation of employe	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produ	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
3 056 675	+ Exports
-3 265 378	- Imports
9 027 862	= GDP

Matrix of intra-EU imports (extracted from the initial table)

No	Products	1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
8	Products of agriculture, fo	2 628	21 633	64	902	48	449	25 724	13 000	0	0	13 000	749	- 90	659	4 339	2 004	6 343	20 003	45 726
9	Products from mining and	15 467	668 239	52 976	75 654	22 287	43 064	877 686	313 306	59	9 784	323 149	206 534	8 970	215 504	265 933	94 569	360 502	899 155	1 776 841
10	Construction work	4	1 229	1 120	76	147	55	2 630	511	0	17	528	5 656	5	5 661	8	14	22	6 210	8 840
11	Wholesale and retail trade	3 691	66 596	8 065	78 492	9 892	10 722	177 459	112 402	4	2 853	115 259	9 988	456	10 444	5 120	13 406	18 525	144 228	321 687
12	Financial intermediation s	535	37 318	4 416	14 121	44 800	7 486	108 675	8 577	79	381	9 036	12 205	- 12	12 193	3 281	2 765	6 045	27 274	135 950
13	Other services	17	1 517	27	409	595	4 618	7 182	2 240	523	6 304	9 067	121	78	199	526	465	991	10 257	17 440
14	Total imports from EU co	22 341	796 532	66 667	169 653	77 769	66 393	1 199 356	450 036	666	19 338	470 040	235 252	9 407	244 660	279 206	113 222	392 429	1 107 128	2 306 483
22	Taxes less subsidies on p	4 505	70 693	20 710	79 268	67 511	68 320	311 007	527 626	644	7 549	535 820	127 215	318	127 533	3 301	8 305	11 606	674 960	985 967

Comments:

1. The amount of TLS of intra-EU exports (Q49) has been added row-wise to the row of TLS (exc. Exports) and subsequently deducted column-wise from the matrix of intra-EU imports.
2. The GDP remains unchanged.

Step 2: Transit trade: from EU to Rest of the World

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

Transit trade: from EU to RoW (Step 2)

	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE)							FINAL USES											
		Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total uses
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, fo	45 485	176 399	1 567	11 266	1 386	4 879	240 981	66 830	9	501	67 340	5 141	362	5 503	26 568	13 443	40 011	112 854	353 835
2	Products from mining and	61 624	1 541 834	226 854	301 510	114 282	163 905	2 410 008	954 221	160	24 211	978 592	355 132	20 841	375 973	1 122 671	711 830	1 834 501	3 189 067	5 599 075
3	Construction work	2 555	31 861	161 391	29 687	79 956	34 811	340 262	34 905	0	2 850	37 755	771 091	115	771 206	4 851	2 043	6 894	815 855	1 156 117
4	Wholesale and retail trade	28 558	464 183	71 408	501 268	144 486	119 124	1 329 026	1 512 051	167	40 636	1 552 854	108 690	4 036	112 726	268 531	154 670	423 201	2 088 781	3 417 807
5	Financial intermediation s	15 980	464 284	108 057	426 239	891 079	198 442	2 104 080	1 121 001	4 644	45 646	1 171 291	185 857	1 857	187 713	125 959	89 727	215 685	1 574 690	3 678 770
6	Other services	5 376	49 205	4 842	41 168	65 667	163 938	330 196	487 951	119 036	1 672 587	2 279 574	15 547	268	15 815	10 603	10 632	21 235	2 316 624	2 646 820
7	Total national domestic u	159 578	2 727 764	574 120	1 311 137	1 296 856	685 098	6 754 554	4 176 960	124 016	1 786 432	6 087 407	1 441 459	27 478	1 468 937	1 559 182	982 345	2 541 527	10 097 871	16 852 425
8	Products of agriculture, fo	2 626	21 627	64	901	48	447	25 712	12 948	0	0	12 949	747	- 90	658	4 339	0	4 339	17 945	43 658
9	Products from mining and	15 456	668 038	52 920	75 534	22 221	42 914	877 083	312 061	59	9 771	321 891	206 156	8 969	215 124	265 933	0	265 933	802 948	1 680 032
10	Construction work	4	1 228	1 119	75	146	55	2 627	509	0	17	526	5 645	5	5 651	8	0	8	6 184	8 811
11	Wholesale and retail trade	3 688	66 576	8 056	78 368	9 863	10 685	177 237	111 956	4	2 849	114 809	9 970	456	10 426	5 120	0	5 120	130 354	307 591
12	Financial intermediation s	534	37 307	4 411	14 099	44 668	7 460	108 479	8 543	78	380	9 001	12 182	- 12	12 170	3 281	0	3 281	24 452	132 931
13	Other services	17	1 516	27	408	594	4 602	7 163	2 231	521	6 296	9 048	121	78	199	526	0	526	9 773	16 937
14	Total imports from EU co	22 326	796 292	66 597	169 385	77 540	66 162	1 198 302	448 248	663	19 312	468 224	234 821	9 406	244 228	279 206	0	279 206	991 658	2 189 960
15	Products of agriculture, fo	1 969	15 010	62	732	55	303	18 132	8 266	0	2	8 268	482	- 70	412	1 487	604	2 091	10 772	28 904
16	Products from mining and	4 835	333 541	20 083	29 967	10 546	22 350	421 320	144 458	21	3 821	148 300	113 819	9 121	122 940	61 413	46 655	108 068	379 308	800 628
17	Construction work	2	293	1 074	26	90	58	1 543	128	0	0	128	838	2	840	5	3	8	976	2 519
18	Wholesale and retail trade	182	11 511	711	20 389	3 486	1 513	37 792	7 900	0	121	8 022	1 766	- 2	1 763	887	1 577	2 464	12 249	50 041
19	Financial intermediation s	268	18 607	2 439	10 684	22 184	4 634	58 817	2 487	44	87	2 618	5 568	0	5 569	174	1 149	1 324	9 511	68 327
20	Other services	11	900	16	635	878	5 569	8 009	1 930	171	923	3 024	244	40	285	228	231	459	3 768	11 776
21	Total imports from third c	7 268	379 862	24 386	62 433	37 239	34 427	545 613	165 169	236	4 954	170 359	122 718	9 091	131 809	64 194	50 220	114 414	416 582	962 196
22	Taxes less subsidies on p	4 520	70 933	20 780	79 536	67 740	68 552	312 061	529 414	646	7 575	537 635	127 646	319	127 965	0	8 305	8 305	673 906	985 967
23	Total intermediate consur	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	1 902 583	1 040 870	2 943 453	12 180 018	20 990 547
24	Compensation of employe	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produ	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
2 943 453	+ Exports
-3 152 156	- Imports
9 027 862	= GDP

Matrix of intra-EU imports (extracted from the initial table)

8	Products of agriculture, fo	2 628	21 633	64	902	48	449	25 724	13 000	0	0	13 000	749	- 90	659	4 339	2 004	6 343	20 003	45 726
9	Products from mining and	15 467	668 239	52 976	75 654	22 287	43 064	877 686	313 306	59	9 784	323 149	206 534	8 970	215 504	265 933	94 569	360 502	899 155	1 776 841
10	Construction work	4	1 229	1 120	76	147	55	2 630	511	0	17	528	5 656	5	5 661	8	14	22	6 210	8 840
11	Wholesale and retail trade	3 691	66 596	8 065	78 492	9 892	10 722	177 459	112 402	4	2 853	115 259	9 988	456	10 444	5 120	13 406	18 525	144 228	321 687
12	Financial intermediation s	535	37 318	4 416	14 121	44 800	7 486	108 675	8 577	79	381	9 036	12 205	- 12	12 193	3 281	2 765	6 045	27 274	135 950
13	Other services	17	1 517	27	409	595	4 618	7 182	2 240	523	6 304	9 067	121	78	199	526	465	991	10 257	17 440
14	Total imports from EU co	22 341	796 532	66 667	169 653	77 769	66 393	1 199 356	450 036	666	19 338	470 040	235 252	9 407	244 660	279 206	113 222	392 429	1 107 128	2 306 483
22	Taxes less subsidies on p	4 505	70 693	20 710	79 268	67 511	68 320	311 007	527 626	644	7 549	535 820	127 215	318	127 533	3 301	8 305	11 606	674 960	985 967

Comments:

1. Transit trade: from EU country to Rest of the World.
2. The values in R14:R19 are transferred to R7:R12. Then, the values in Q7:Q12 are reduced row-wise in the same amount to keep row totals of exports unchanged.
3. GDP remains unchanged.

Step 3: Transit trade: from Rest of the World to EU

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

Transit trade: from RoW to EU (Step 3)

		OUTPUT OF INDUSTRIES (NACE)							FINAL USES											
	INDUSTRIES (NACE) / PRODUCTS (CPA)	Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total uses
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, fo	45 485	176 399	1 567	11 266	1 386	4 879	240 981	66 830	9	501	67 340	5 141	362	5 503	26 568	13 443	40 011	112 854	353 835
2	Products from mining and	61 624	1 541 834	226 854	301 510	114 282	163 905	2 410 008	954 221	160	24 211	978 592	355 132	20 841	375 973	1 122 671	711 830	1 834 501	3 189 067	5 599 075
3	Construction work	2 555	31 861	161 391	29 687	79 956	34 811	340 262	34 905	0	2 850	37 755	771 091	115	771 206	4 851	2 043	6 894	815 855	1 156 117
4	Wholesale and retail trade	28 558	464 183	71 408	501 268	144 486	119 124	1 329 026	1 512 051	167	40 636	1 552 854	108 690	4 036	112 726	268 531	154 670	423 201	2 088 781	3 417 807
5	Financial intermediation s	15 980	464 284	108 057	426 239	891 079	198 442	2 104 080	1 121 001	4 644	45 646	1 171 291	185 857	1 857	187 713	125 959	89 727	215 685	1 574 690	3 678 770
6	Other services	5 376	49 205	4 842	41 168	65 667	163 938	330 196	487 951	119 036	1 672 587	2 279 574	15 547	268	15 815	10 603	10 632	21 235	2 316 624	2 646 820
7	Total national domestic us	159 578	2 727 764	574 120	1 311 137	1 296 856	685 098	6 754 554	4 176 960	124 016	1 786 432	6 087 407	1 441 459	27 478	1 468 937	1 559 182	982 345	2 541 527	10 097 871	16 852 425
8	Products of agriculture, fo	2 527	20 809	61	867	46	430	24 740	12 458	0	0	12 459	719	- 86	633	4 339	0	4 339	17 431	42 170
9	Products from mining and	14 785	639 026	50 622	72 254	21 256	41 050	838 992	298 509	57	9 346	307 912	197 203	8 579	205 782	265 933	0	265 933	779 626	1 618 619
10	Construction work	4	1 228	1 118	75	146	55	2 626	509	0	17	525	5 642	5	5 648	8	0	8	6 181	8 807
11	Wholesale and retail trade	3 678	66 381	8 033	78 138	9 834	10 654	176 717	111 628	4	2 841	114 473	9 940	455	10 395	5 120	0	5 120	129 987	306 705
12	Financial intermediation s	534	37 256	4 405	14 080	44 608	7 450	108 333	8 531	78	380	8 989	12 166	- 12	12 154	3 281	0	3 281	24 424	132 757
13	Other services	17	1 495	26	402	585	4 538	7 064	2 200	514	6 208	8 922	119	77	196	526	0	526	9 645	16 709
14	Total imports from EU co	21 543	766 195	64 266	165 816	76 476	64 176	1 158 472	433 835	654	18 792	453 280	225 790	9 018	234 807	279 206	0	279 206	967 294	2 125 766
15	Products of agriculture, fo	2 068	15 829	65	766	57	320	19 105	8 755	0	2	8 758	510	- 73	437	0	604	604	9 799	28 904
16	Products from mining and	5 506	362 553	22 381	33 247	11 511	24 213	459 411	158 011	23	4 246	162 280	122 772	9 511	132 283	0	46 655	46 655	341 217	800 628
17	Construction work	2	293	1 075	26	90	58	1 544	128	0	0	128	841	2	843	0	3	3	974	2 519
18	Wholesale and retail trade	193	11 707	735	20 619	3 515	1 544	38 312	8 229	0	129	8 358	1 795	- 1	1 794	0	1 577	1 577	11 729	50 041
19	Financial intermediation s	269	18 657	2 445	10 703	22 244	4 644	58 963	2 498	44	88	2 630	5 585	0	5 585	0	1 149	1 149	9 365	68 327
20	Other services	11	921	16	641	886	5 633	8 108	1 961	178	1 011	3 149	246	41	287	0	231	231	3 668	11 776
21	Total imports from third co	8 050	409 959	26 717	66 002	38 303	36 413	585 443	179 582	246	5 475	185 303	131 749	9 480	141 229	0	50 220	50 220	376 752	962 196
22	Taxes less subsidies on p	4 520	70 933	20 780	79 536	67 740	68 552	312 061	529 414	646	7 575	537 635	127 646	319	127 965	0	8 305	8 305	673 906	985 967
23	Total intermediate consum	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	1 838 389	1 040 870	2 879 259	12 115 823	20 926 353
24	Compensation of employe	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produc	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
2 879 259	+ Exports
-3 087 961	- Imports
9 027 862	= GDP

Matrix of intra-EU imports (extracted from the initial table)

No	Products	1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
8	Products of agriculture, fo	2 628	21 633	64	902	48	449	25 724	13 000	0	0	13 000	749	- 90	659	4 339	2 004	6 343	20 003	45 726
9	Products from mining and	15 467	668 239	52 976	75 654	22 287	43 064	877 686	313 306	59	9 784	323 149	206 534	8 970	215 504	265 933	94 569	360 502	899 155	1 776 841
10	Construction work	4	1 229	1 120	76	147	55	2 630	511	0	17	528	5 656	5	5 661	8	14	22	6 210	8 840
11	Wholesale and retail trade	3 691	66 596	8 065	78 492	9 892	10 722	177 459	112 402	4	2 853	115 259	9 988	456	10 444	5 120	13 406	18 525	144 228	321 687
12	Financial intermediation s	535	37 318	4 416	14 121	44 800	7 486	108 675	8 577	79	381	9 036	12 205	- 12	12 193	3 281	2 765	6 045	27 274	135 950
13	Other services	17	1 517	27	409	595	4 618	7 182	2 240	523	6 304	9 067	121	78	199	526	465	991	10 257	17 440
14	Total imports from EU co	22 341	796 532	66 667	169 653	77 769	66 393	1 199 356	450 036	666	19 338	470 040	235 252	9 407	244 660	279 206	113 222	392 429	1 107 128	2 306 483
22	Taxes less subsidies on p	4 505	70 693	20 710	79 268	67 511	68 320	311 007	527 626	644	7 549	535 820	127 215	318	127 533	3 301	8 305	11 606	674 960	985 967

Comments:

1. Transit trade: from Rest of the World to EU country.
2. The extra-EU imports that have been re-exported to the EU (Q21:Q26) have been transferred row-wise to the matrix of extra-EU imports using the row structures of the matrix of intra-EU imports.
3. GDP remains unchanged.

Step 4: Transit trade: from EU to EU

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

Transit trade: from EU to EU (Step 4)

	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE): Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	FINAL USES: Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total uses
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, fo	45 485	176 399	1 567	11 266	1 386	4 879	240 981	66 830	9	501	67 340	5 141	362	5 503	26 568	13 443	40 011	112 854	353 835
2	Products from mining and	61 624	1 541 834	226 854	301 510	114 282	163 905	2 410 008	954 221	160	24 211	978 592	355 132	20 841	375 973	1 122 671	711 830	1 834 501	3 189 067	5 599 075
3	Construction work	2 555	31 861	161 391	29 687	79 956	34 811	340 262	34 905	0	2 850	37 755	771 091	115	771 206	4 851	2 043	6 894	815 855	1 156 117
4	Wholesale and retail trade	28 558	464 183	71 408	501 268	144 486	119 124	1 329 026	1 512 051	167	40 636	1 552 854	108 690	4 036	112 726	268 531	154 670	423 201	2 088 781	3 417 807
5	Financial intermediation s	15 980	464 284	108 057	426 239	891 079	198 442	2 104 080	1 121 001	4 644	45 646	1 171 291	185 857	1 857	187 713	125 959	89 727	215 685	1 574 690	3 678 770
6	Other services	5 376	49 205	4 842	41 168	65 667	163 938	330 196	487 951	119 036	1 672 587	2 279 574	15 547	268	15 815	10 603	10 632	21 235	2 316 624	2 646 820
7	Total national domestic u	159 578	2 727 764	574 120	1 311 137	1 296 856	685 098	6 754 554	4 176 960	124 016	1 786 432	6 087 407	1 441 459	27 478	1 468 937	1 559 182	982 345	2 541 527	10 097 871	16 852 425
8	Products of agriculture, fo	2 527	20 809	61	867	46	430	24 740	12 458	0	0	12 459	719	- 86	633	0	0	0	13 091	37 831
9	Products from mining and	14 785	639 026	50 622	72 254	21 256	41 050	838 992	298 509	57	9 346	307 912	197 203	8 579	205 782	0	0	0	513 693	1 352 686
10	Construction work	4	1 228	1 118	75	146	55	2 626	509	0	17	525	5 642	5	5 648	0	0	0	6 173	8 799
11	Wholesale and retail trade	3 678	66 381	8 033	78 138	9 834	10 654	176 717	111 628	4	2 841	114 473	9 940	455	10 395	0	0	0	124 868	301 585
12	Financial intermediation s	534	37 256	4 405	14 080	44 608	7 450	108 333	8 531	78	380	8 989	12 166	- 12	12 154	0	0	0	21 143	129 476
13	Other services	17	1 495	26	402	585	4 538	7 064	2 200	514	6 208	8 922	119	77	196	0	0	0	9 119	16 182
14	Total imports from EU co	21 543	766 195	64 266	165 816	76 476	64 176	1 158 472	433 835	654	18 792	453 280	225 790	9 018	234 807	0	0	0	688 087	1 846 559
15	Products of agriculture, fo	2 068	15 829	65	766	57	320	19 105	8 755	0	2	8 758	510	- 73	437	0	604	604	9 799	28 904
16	Products from mining and	5 506	362 553	22 381	33 247	11 511	24 213	459 411	158 011	23	4 246	162 280	122 772	9 511	132 283	0	46 655	46 655	341 217	800 628
17	Construction work	2	293	1 075	26	90	58	1 544	128	0	0	128	841	2	843	0	3	3	974	2 519
18	Wholesale and retail trade	193	11 707	735	20 619	3 515	1 544	38 312	8 229	0	129	8 358	1 795	- 1	1 794	0	1 577	1 577	11 729	50 041
19	Financial intermediation s	269	18 657	2 445	10 703	22 244	4 644	58 963	2 498	44	88	2 630	5 585	0	5 585	0	1 149	1 149	9 365	68 327
20	Other services	11	921	16	641	886	5 633	8 108	1 961	178	1 011	3 149	246	41	287	0	231	231	3 668	11 776
21	Total imports from third c	8 050	409 959	26 717	66 002	38 303	36 413	585 443	179 582	246	5 475	185 303	131 749	9 480	141 229	0	50 220	50 220	376 752	962 196
22	Taxes less subsidies on p	4 520	70 933	20 780	79 536	67 740	68 552	312 061	529 414	646	7 575	537 635	127 646	319	127 965	0	8 305	8 305	673 906	985 967
23	Total intermediate consum	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	1 559 182	1 040 870	2 600 052	11 836 617	20 647 146
24	Compensation of employe	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produ	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
2 600 052	+ Exports
-2 808 755	- Imports
9 027 862	= GDP

Matrix of intra-EU imports (extracted from the initial table)

No	Products	1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
8	Products of agriculture, fo	2 628	21 633	64	902	48	449	25 724	13 000	0	0	13 000	749	- 90	659	4 339	2 004	6 343	20 003	45 726
9	Products from mining and	15 467	668 239	52 976	75 654	22 287	43 064	877 686	313 306	59	9 784	323 149	206 534	8 970	215 504	265 933	94 569	360 502	899 155	1 776 841
10	Construction work	4	1 229	1 120	76	147	55	2 630	511	0	17	528	5 656	5	5 661	8	14	22	6 210	8 840
11	Wholesale and retail trade	3 691	66 596	8 065	78 492	9 892	10 722	177 459	112 402	4	2 853	115 259	9 988	456	10 444	5 120	13 406	18 525	144 228	321 687
12	Financial intermediation s	535	37 318	4 416	14 121	44 800	7 486	108 675	8 577	79	381	9 036	12 205	- 12	12 193	3 281	2 765	6 045	27 274	135 950
13	Other services	17	1 517	27	409	595	4 618	7 182	2 240	523	6 304	9 067	121	78	199	526	465	991	10 257	17 440
14	Total imports from EU co	22 341	796 532	66 667	169 653	77 769	66 393	1 199 356	450 036	666	19 338	470 040	235 252	9 407	244 660	279 206	113 222	392 429	1 107 128	2 306 483
22	Taxes less subsidies on p	4 505	70 693	20 710	79 268	67 511	68 320	311 007	527 626	644	7 549	535 820	127 215	318	127 533	3 301	8 305	11 606	674 960	985 967

Comments:

1. Transit trade: EU - EU - EU: the first EU country has recorded the flow as exports to an EU country, the last EU country has recorded the flow as imports from EU country. The transit trade country recording of the flow is only double counting.
The column is set to zero without adjustments in other parts of the table.

Step 5: Re-scaling of total imports to meet total exports (balancing asymmetries)

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

Re-scaling of total imports to meet total exports (balancing asymmetries) - (Step 5)

	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE)							FINAL USES											
		Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total uses
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, f	45 485	176 399	1 567	11 266	1 386	4 879	240 981	66 830	9	501	67 340	5 141	362	5 503	26 568	13 443	40 011	112 854	353 835
2	Products from mining and	61 624	1 541 834	226 854	301 510	114 282	163 905	2 410 008	954 221	160	24 211	978 592	355 132	20 841	375 973	1 122 671	711 830	1 834 501	3 189 067	5 599 075
3	Construction work	2 555	31 861	161 391	29 687	79 956	34 811	340 262	34 905	0	2 850	37 755	771 091	115	771 206	4 851	2 043	6 894	815 855	1 156 117
4	Wholesale and retail trad	28 558	464 183	71 408	501 268	144 486	119 124	1 329 026	1 512 051	167	40 636	1 552 854	108 690	4 036	112 726	268 531	154 670	423 201	2 088 781	3 417 807
5	Financial intermediation s	15 980	464 284	108 057	426 239	891 079	198 442	2 104 080	1 121 001	4 644	45 646	1 171 291	185 857	1 857	187 713	125 959	89 727	215 685	1 574 690	3 678 770
6	Other services	5 376	49 205	4 842	41 168	65 667	163 938	330 196	487 951	119 036	1 672 587	2 279 574	15 547	268	15 815	10 603	10 632	21 235	2 316 624	2 646 820
7	Total national domestic u	159 578	2 727 764	574 120	1 311 137	1 296 856	685 098	6 754 554	4 176 960	124 016	1 786 432	6 087 407	1 441 459	27 478	1 468 937	1 559 182	982 345	2 541 527	10 097 871	16 852 425
8	Products of agriculture, f	2 134	17 570	52	732	39	363	20 889	10 519	0	0	10 520	607	- 73	534	0	0	0	11 054	31 943
9	Products from mining and	12 484	539 575	42 744	61 009	17 948	34 661	708 421	252 052	48	7 892	259 992	166 512	7 244	173 756	0	0	0	433 748	1 142 169
10	Construction work	3	1 037	944	64	123	46	2 217	429	0	14	444	4 764	4	4 769	0	0	0	5 212	7 430
11	Wholesale and retail trad	3 105	56 050	6 783	65 977	8 304	8 996	149 215	94 255	4	2 399	96 657	8 393	384	8 777	0	0	0	105 435	254 650
12	Financial intermediation s	451	31 458	3 720	11 889	37 666	6 290	91 473	7 204	66	321	7 590	10 273	- 10	10 262	0	0	0	17 853	109 326
13	Other services	14	1 263	22	340	494	3 831	5 964	1 858	434	5 242	7 534	101	65	166	0	0	0	7 700	13 664
14	Total imports from EU co	18 190	646 953	54 264	140 010	64 574	54 188	978 181	366 318	552	15 867	382 737	190 650	7 614	198 265	0	0	0	581 001	1 559 182
15	Products of agriculture, f	2 462	19 067	74	901	64	387	22 955	10 694	0	2	10 697	622	- 86	536	0	604	604	11 836	34 791
16	Products from mining and	7 807	462 004	30 259	44 492	14 819	30 602	589 982	204 467	32	5 700	210 199	153 462	10 846	164 308	0	46 655	46 655	421 162	1 011 146
17	Construction work	3	484	1 249	38	113	67	1 953	207	0	3	210	1 720	3	1 722	0	3	3	1 935	3 888
18	Wholesale and retail trad	766	22 037	1 985	32 779	5 045	3 202	65 814	25 601	1	571	26 173	3 342	70	3 412	0	1 577	1 577	31 162	96 976
19	Financial intermediation s	352	24 455	3 131	12 894	29 186	5 804	75 822	3 826	56	147	4 029	7 478	- 2	7 477	0	1 149	1 149	12 655	88 478
20	Other services	14	1 153	20	704	977	6 339	9 208	2 303	258	1 977	4 538	265	53	318	0	231	231	5 087	14 295
21	Total imports from third c	11 403	529 201	36 719	91 807	50 205	46 400	765 735	247 099	347	8 400	255 846	166 889	10 883	177 772	0	50 220	50 220	483 838	1 249 573
22	Taxes less subsidies on p	4 520	70 933	20 780	79 536	67 740	68 552	312 061	529 414	646	7 575	537 635	127 646	319	127 965	0	8 305	8 305	673 906	985 967
23	Total intermediate consu	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	1 559 182	1 040 870	2 600 052	11 836 617	20 647 146
24	Compensation of employ	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produ	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
2 600 052	+ Exports
-2 808 755	- Imports
9 027 862	= GDP

Matrix of intra-EU imports (extracted from the initial table)

No	Products	1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
8	Products of agriculture, f	2 628	21 633	64	902	48	449	25 724	13 000	0	0	13 000	749	- 90	659	4 339	2 004	6 343	20 003	45 726
9	Products from mining and	15 467	668 239	52 976	75 654	22 287	43 064	877 686	313 306	59	9 784	323 149	206 534	8 970	215 504	265 933	94 569	360 502	899 155	1 776 841
10	Construction work	4	1 229	1 120	76	147	55	2 630	511	0	17	528	5 656	5	5 661	8	14	22	6 210	8 840
11	Wholesale and retail trad	3 691	66 596	8 065	78 492	9 892	10 722	177 459	112 402	4	2 853	115 259	9 988	456	10 444	5 120	13 406	18 525	144 228	321 687
12	Financial intermediation s	535	37 318	4 416	14 121	44 800	7 486	108 675	8 577	79	381	9 036	12 205	- 12	12 193	3 281	2 765	6 045	27 274	135 950
13	Other services	17	1 517	27	409	595	4 618	7 182	2 240	523	6 304	9 067	121	78	199	526	465	991	10 257	17 440
14	Total imports from EU co	22 341	796 532	66 667	169 653	77 769	66 393	1 199 356	450 036	666	19 338	470 040	235 252	9 407	244 660	279 206	113 222	392 429	1 107 128	2 306 483
22	Taxes less subsidies on p	4 505	70 693	20 710	79 268	67 511	68 320	311 007	527 626	644	7 549	535 820	127 215	318	127 533	3 301	8 305	11 606	674 960	985 967
xx	Intra EU-trade discrepanc	3 353	119 242	10 002	25 806	11 902	9 988	180 291	67 517	102	2 925	70 543	35 139	1 403	36 543	0	0	0	107 086	287 377

Comments:
1. The intra-EU import matrix has been re-scaled to meet the total intra-EU exports (Balancing asymmetries)
2. The difference has been added to imports from the RoW
3. The intra-EU trade discrepancies on imports are reported in line 51.

Step 6: GRAS results only (macro in external file)

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

GRAS results only (macro in external file)

No	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE)							FINAL USES											Total uses
		Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, fo	45 485	176 399	1 567	11 266	1 386	4 879	240 981	66 830	9	501	67 340	5 141	362	5 503	26 568	13 443	40 011	112 854	353 835
2	Products from mining and	61 624	1 541 834	226 854	301 510	114 282	163 905	2 410 008	954 221	160	24 211	978 592	355 132	20 841	375 973	1 122 671	711 830	1 834 501	3 189 067	5 599 075
3	Construction work	2 555	31 861	161 391	29 687	79 956	34 811	340 262	34 905	0	2 850	37 755	771 091	115	771 206	4 851	2 043	6 894	815 855	1 156 117
4	Wholesale and retail trade	28 558	464 183	71 408	501 268	144 486	119 124	1 329 026	1 512 051	167	40 636	1 552 854	108 690	4 036	112 726	268 531	154 670	423 201	2 088 781	3 417 807
5	Financial intermediation s	15 980	464 284	108 057	426 239	891 079	198 442	2 104 080	1 121 001	4 644	45 646	1 171 291	185 857	1 857	187 713	125 959	89 727	215 685	1 574 690	3 678 770
6	Other services	5 376	49 205	4 842	41 168	65 667	163 938	330 196	487 951	119 036	1 672 587	2 279 574	15 547	268	15 815	10 603	10 632	21 235	2 316 624	2 646 820
7	Total national domestic u	159 578	2 727 764	574 120	1 311 137	1 296 856	685 098	6 754 554	4 176 960	124 016	1 786 432	6 087 407	1 441 459	27 478	1 468 937	1 559 182	982 345	2 541 527	10 097 871	16 852 425
8	Products of agriculture, fo	1 801	14 668	43	585	29	301	17 427	8 717	0	0	8 717	510	- 86	424	0	0	0	9 141	26 568
9	Products from mining and	12 462	532 717	41 923	57 688	15 802	33 927	694 520	247 009	57	8 402	255 467	165 444	7 240	172 684	0	0	0	428 151	1 122 671
10	Construction work	2	676	612	40	72	30	1 432	278	0	10	288	3 128	3	3 131	0	0	0	3 419	4 851
11	Wholesale and retail trade	3 367	60 103	7 225	67 758	7 940	9 563	155 956	100 322	5	2 774	103 101	9 058	417	9 474	0	0	0	112 575	268 531
12	Financial intermediation s	548	37 836	4 444	13 694	40 399	7 501	104 422	8 600	96	416	9 112	12 434	- 8	12 426	0	0	0	21 537	125 959
13	Other services	11	953	17	246	333	2 867	4 425	1 392	394	4 266	6 052	76	50	126	0	0	0	6 178	10 603
14	Total imports from EU co	18 190	646 953	54 264	140 010	64 574	54 188	978 181	366 318	552	15 867	382 737	190 650	7 614	198 265	0	0	0	581 001	1 559 182
15	Products of agriculture, fo	2 462	19 067	74	901	64	387	22 955	10 694	0	2	10 697	622	- 86	536	0	604	604	11 836	34 791
16	Products from mining and	7 807	462 004	30 259	44 492	14 819	30 602	589 982	204 467	32	5 700	210 199	153 462	10 846	164 308	0	46 655	46 655	421 162	1 011 145
17	Construction work	3	484	1 249	38	113	67	1 953	207	0	3	210	1 720	3	1 722	0	3	3	1 935	3 888
18	Wholesale and retail trade	766	22 037	1 985	32 779	5 045	3 202	65 814	25 601	1	571	26 173	3 342	70	3 412	0	1 577	1 577	31 162	96 976
19	Financial intermediation s	352	24 455	3 131	12 894	29 186	5 804	75 822	3 826	56	147	4 029	7 478	- 2	7 477	0	1 149	1 149	12 655	88 478
20	Other services	14	1 153	20	704	977	6 339	9 208	2 303	258	1 977	4 538	265	53	318	0	231	231	5 087	14 295
21	Total imports from third c	11 403	529 201	36 719	91 807	50 205	46 400	765 735	247 099	347	8 400	255 846	166 889	10 883	177 772	0	50 220	50 220	483 838	1 249 573
22	Taxes less subsidies on p	4 520	70 933	20 780	79 536	67 740	68 552	312 061	529 414	646	7 575	537 635	127 646	319	127 965	0	8 305	8 305	673 906	985 967
23	Total intermediate consur	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	1 559 182	1 040 870	2 600 052	11 836 617	20 647 146
24	Compensation of employe	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produ	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
2 600 052	+ Exports
-2 808 755	- Imports
9 027 862	= GDP

Matrix of intra-EU imports (extracted from the initial table)

No	Products	1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
8	Products of agriculture, fo	2 628	21 633	64	902	48	449	25 724	13 000	0	0	13 000	749	- 90	659	4 339	2 004	6 343	20 003	45 726
9	Products from mining and	15 467	668 239	52 976	75 654	22 287	43 064	877 686	313 306	59	9 784	323 149	206 534	8 970	215 504	265 933	94 569	360 502	899 155	1 776 841
10	Construction work	4	1 229	1 120	76	147	55	2 630	511	0	17	528	5 656	5	5 661	8	14	22	6 210	8 840
11	Wholesale and retail trade	3 691	66 596	8 065	78 492	9 892	10 722	177 459	112 402	4	2 853	115 259	9 988	456	10 444	5 120	13 406	18 525	144 228	321 687
12	Financial intermediation s	535	37 318	4 416	14 121	44 800	7 486	108 675	8 577	79	381	9 036	12 205	- 12	12 193	3 281	2 765	6 045	27 274	135 950
13	Other services	17	1 517	27	409	595	4 618	7 182	2 240	523	6 304	9 067	121	78	199	526	465	991	10 257	17 440
14	Total imports from EU co	22 341	796 532	66 667	169 653	77 769	66 393	1 199 356	450 036	666	19 338	470 040	235 252	9 407	244 660	279 206	113 222	392 429	1 107 128	2 306 483
22	Taxes less subsidies on p	4 505	70 693	20 710	79 268	67 511	68 320	311 007	527 626	644	7 549	535 820	127 215	318	127 533	3 301	8 305	11 606	674 960	985 967
xx	Intra EU-trade discrepanc	3 353	119 242	10 002	25 806	11 902	9 988	180 291	67 517	102	2 925	70 543	35 139	1 403	36 543	0	0	0	107 086	287 377

Comments:

1. Gras results for now calculated in seperate workbook (GRAS_rowlast.xls)

Step 7: Consolidated Use Table at basic prices

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

Consolidated Use Table (Step 7)

	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE)							FINAL USES												
		Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total uses
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, fo	47 286	191 067	1 610	11 851	1 415	5 179	258 408	75 547	9	502	76 058	5 651	275	5 926	0	13 443	13 443	95 428	353 835
2	Products from mining and	74 086	2 074 551	268 777	359 198	130 084	197 832	3 104 528	1 201 230	217	32 613	1 234 060	520 576	28 081	548 657	0	711 830	711 830	2 494 547	5 599 075
3	Construction work	2 557	32 537	162 003	29 727	80 028	34 841	341 693	35 183	0	2 860	38 043	774 220	118	774 337	0	2 043	2 043	814 423	1 156 117
4	Wholesale and retail trade	31 924	524 285	78 633	569 025	152 426	128 688	1 484 982	1 612 373	172	43 410	1 655 955	117 748	4 453	122 201	0	154 670	154 670	1 932 825	3 417 807
5	Financial intermediation s	16 528	502 120	112 501	439 934	931 478	205 942	2 208 502	1 129 601	4 740	46 062	1 180 403	198 291	1 848	200 139	0	89 727	89 727	1 470 268	3 678 770
6	Other services	5 387	50 158	4 859	41 413	66 000	166 804	334 621	489 343	119 430	1 676 852	2 285 626	15 624	317	15 941	0	10 632	10 632	2 312 199	2 646 820
7	Total national domestic u	177 769	3 374 717	628 384	1 451 147	1 361 430	739 287	7 732 734	4 543 278	124 568	1 802 299	6 470 144	1 632 109	35 092	1 667 201	0	982 345	982 345	9 119 691	16 852 425
8	Products of agriculture, fo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Products from mining and	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Construction work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Wholesale and retail trade	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Financial intermediation s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Other services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Total imports from EU co	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Products of agriculture, fo	2 462	19 067	74	901	64	387	22 955	10 694	0	2	10 697	622	- 86	536	0	604	604	11 836	34 791
16	Products from mining and	7 807	462 004	30 259	44 492	14 819	30 602	589 982	204 467	32	5 700	210 199	153 462	10 846	164 308	0	46 655	46 655	421 162	1 011 145
17	Construction work	3	484	1 249	38	113	67	1 953	207	0	3	210	1 720	3	1 722	0	3	3	1 935	3 888
18	Wholesale and retail trade	766	22 037	1 985	32 779	5 045	3 202	65 814	25 601	1	571	26 173	3 342	70	3 412	0	1 577	1 577	31 162	96 976
19	Financial intermediation s	352	24 455	3 131	12 894	29 186	5 804	75 822	3 826	56	147	4 029	7 478	- 2	7 477	0	1 149	1 149	12 655	88 478
20	Other services	14	1 153	20	704	977	6 339	9 208	2 303	258	1 977	4 538	265	53	318	0	231	231	5 087	14 295
21	Total imports from third c	11 403	529 201	36 719	91 807	50 205	46 400	765 735	247 099	347	8 400	255 846	166 889	10 883	177 772	0	50 220	50 220	483 838	1 249 573
22	Taxes less subsidies on p	4 520	70 933	20 780	79 536	67 740	68 552	312 061	529 414	646	7 575	537 635	127 646	319	127 965	0	8 305	8 305	673 906	985 967
23	Total intermediate consum	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	0	1 040 870	1 040 870	10 277 435	19 087 964
24	Compensation of employe	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produ	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
1 040 870	+ Exports
-1 249 573	- Imports
9 027 862	= GDP

Matrix of intra-EU imports (extracted from the initial table)

No	Products	1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
8	Products of agriculture, fo	2 628	21 633	64	902	48	449	25 724	13 000	0	0	13 000	749	- 90	659	4 339	2 004	6 343	20 003	45 726
9	Products from mining and	15 467	668 239	52 976	75 654	22 287	43 064	877 686	313 306	59	9 784	323 149	206 534	8 970	215 504	265 933	94 569	360 502	899 155	1 776 841
10	Construction work	4	1 229	1 120	76	147	55	2 630	511	0	17	528	5 656	5	5 661	8	14	22	6 210	8 840
11	Wholesale and retail trade	3 691	66 596	8 065	78 492	9 892	10 722	177 459	112 402	4	2 853	115 259	9 988	456	10 444	5 120	13 406	18 525	144 228	321 687
12	Financial intermediation s	535	37 318	4 416	14 121	44 800	7 486	108 675	8 577	79	381	9 036	12 205	- 12	12 193	3 281	2 765	6 045	27 274	135 950
13	Other services	17	1 517	27	409	595	4 618	7 182	2 240	523	6 304	9 067	121	78	199	526	465	991	10 257	17 440
14	Total imports from EU co	22 341	796 532	66 667	169 653	77 769	66 393	1 199 356	450 036	666	19 338	470 040	235 252	9 407	244 660	279 206	113 222	392 429	1 107 128	2 306 483
22	Taxes less subsidies on p	4 505	70 693	20 710	79 268	67 511	68 320	311 007	527 626	644	7 549	535 820	127 215	318	127 533	3 301	8 305	11 606	674 960	985 967
xx	Intra EU-trade discrepanc	3 353	119 242	10 002	25 806	11 902	9 988	180 291	67 517	102	2 925	70 543	35 139	1 403	36 543	0	0	0	107 086	287 377

Comments:

1. Final table
2. GDP equal to start of example

Final result: aggregated EU27 SUT

Supply and Use Tables at basic prices of EU27 for the year 2000 (A6)

current prices, mill. Euros

Consolidated Use Table

No	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE): Agriculture, hunting, forestry and fishing	Industry, including energy	Construction	Wholesale and retail trade; repair of motorvehicles and	Financial, real estate, renting and business activities	Other activities	Total	FINAL USES: Final consumption expenditure by households	Final consumption expenditure by non-profit organisation	Final consumption expenditure by government	Final consumption expenditure	Gross fixed capital formation	Changes in inventories and valuables	Gross capital formation	Exports intra EU fob	Exports extra EU fob	Exports	Final uses	Total uses
No		1	2	3	4	5	6	8	9	10	11	12	13	16	17	18	19	20	21	22
1	Products of agriculture, fo	47 286	191 067	1 610	11 851	1 415	5 179	258 408	75 547	9	502	76 058	5 651	275	5 926	0	13 443	13 443	95 428	353 835
2	Products from mining and	74 086	2 074 551	268 777	359 198	130 084	197 832	3 104 528	1 201 230	217	32 613	1 234 060	520 576	28 081	548 657	0	711 830	711 830	2 494 547	5 599 075
3	Construction work	2 557	32 537	162 003	29 727	80 028	34 841	341 693	35 183	0	2 860	38 043	774 220	118	774 337	0	2 043	2 043	814 423	1 156 117
4	Wholesale and retail trade	31 924	524 285	78 633	569 025	152 426	128 688	1 484 982	1 612 373	172	43 410	1 655 955	117 748	4 453	122 201	0	154 670	154 670	1 932 825	3 417 807
5	Financial intermediation s	16 528	502 120	112 501	439 934	931 478	205 942	2 208 502	1 129 601	4 740	46 062	1 180 403	198 291	1 848	200 139	0	89 727	89 727	1 470 268	3 678 770
6	Other services	5 387	50 158	4 859	41 413	66 000	166 804	334 621	489 343	119 430	1 676 852	2 285 626	15 624	317	15 941	0	10 632	10 632	2 312 199	2 646 820
7	Total national domestic us	177 769	3 374 717	628 384	1 451 147	1 361 430	739 287	7 732 734	4 543 278	124 568	1 802 299	6 470 144	1 632 109	35 092	1 667 201	0	982 345	982 345	9 119 691	16 852 425
8	Products of agriculture, fo	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Products from mining and	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	Construction work	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	Wholesale and retail trade	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	Financial intermediation s	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	Other services	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	Total imports from EU co	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	Products of agriculture, fo	2 462	19 067	74	901	64	387	22 955	10 694	0	2	10 697	622	- 86	536	0	604	604	11 836	34 791
16	Products from mining and	7 807	462 004	30 259	44 492	14 819	30 602	589 982	204 467	32	5 700	210 199	153 462	10 846	164 308	0	46 655	46 655	421 162	1 011 145
17	Construction work	3	484	1 249	38	113	67	1 953	207	0	3	210	1 720	3	1 722	0	3	3	1 935	3 888
18	Wholesale and retail trade	766	22 037	1 985	32 779	5 045	3 202	65 814	25 601	1	571	26 173	3 342	70	3 412	0	1 577	1 577	31 162	96 976
19	Financial intermediation s	352	24 455	3 131	12 894	29 186	5 804	75 822	3 826	56	147	4 029	7 478	- 2	7 477	0	1 149	1 149	12 655	88 478
20	Other services	14	1 153	20	704	977	6 339	9 208	2 303	258	1 977	4 538	265	53	318	0	231	231	5 087	14 295
21	Total imports from third c	11 403	529 201	36 719	91 807	50 205	46 400	765 735	247 099	347	8 400	255 846	166 889	10 883	177 772	0	50 220	50 220	483 838	1 249 573
22	Taxes less subsidies on p	4 520	70 933	20 780	79 536	67 740	68 552	312 061	529 414	646	7 575	537 635	127 646	319	127 965	0	8 305	8 305	673 906	985 967
23	Total intermediate consum	193 692	3 974 851	685 882	1 622 491	1 479 375	854 238	8 810 530	5 319 791	125 561	1 818 274	7 263 626	1 926 644	46 295	1 972 939	0	1 040 870	1 040 870	10 277 435	19 087 964
24	Compensation of employe	51 381	1 074 436	270 873	1 030 158	846 191	1 295 432	4 568 470												
25	Other net taxes on produ	- 4 933	32 487	6 686	44 017	52 167	6 610	137 035												
26	Operating surplus, gross	136 658	699 798	179 298	732 786	1 136 511	451 340	3 336 391												
27	Value added at basic pric	183 106	1 806 721	456 857	1 806 962	2 034 869	1 753 381	8 041 895												
28	Output at basic prices	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425												

Comments:
1. Total sectoral and product outputs remain unchanged from the initial table.
2. GDP (from the income side) remains unchanged from the initial table.

8 041 895	Value added
985 967	+ Taxes less subs. on prod.
9 027 862	= GDP
7 263 626	Consumption
1 972 939	+ Capital formation
1 040 870	+ Exports
-1 249 573	- Imports
9 027 862	= GDP

Consolidated Supply Table

No	INDUSTRIES (NACE) / PRODUCTS (CPA)	OUTPUT OF INDUSTRIES (NACE): Agriculture, hunting, forestry and	Industry, including energy	Construction	Wholesale and retail trade; repair	Financial, real estate, renting and	Other activities	Total	intra-EU imports	extra-EU imports	Total supply
No		1	2	3	4	5	6	8	9	10	11
1	Products of agriculture, fo	348 357	2 349	79	2 076	15	960	353 835	0	34 791	388 627
2	Products from mining and	18 519	5 508 434	11 536	48 924	752	10 911	5 599 075	0	1 011 145	6 610 220
3	Construction work	1 996	15 068	1 111 392	13 884	4 794	8 982	1 156 117	0	3 888	1 160 005
4	Wholesale and retail trade	3 718	133 210	6 282	3 240 573	5 336	28 689	3 417 807	0	96 976	3 514 784
5	Financial intermediation s	2 497	44 068	9 811	86 893	3 496 619	38 883	3 678 770	0	88 478	3 767 248
6	Other services	1 712	78 443	3 640	37 104	6 728	2 519 194	2 646 820	0	14 295	2 661 115
7	Total supply	376 798	5 781 572	1 142 739	3 429 453	3 514 244	2 607 619	16 852 425	0	1 249 573	18 101 998

REFERENCES

Bacharach, M. (1970): Biproportional matrices & input-output change. Cambridge: Cambridge University Press.

Beutel, J. (2002): The economic impact of objective 1 intervention for the period 2000-2006. Report to the Directorate-General for Regional Policies, Konstanz. http://ec.europa.eu/comm/regional_policy/sources/docgener/studies/study_en.htm .

Eurostat (1996): European System of Accounts – ESA. Luxembourg: Office for Official Publications of the European Communities.

Eurostat (2008): Manual of Supply, Use and Input-Output Tables. Luxembourg: Office for Official Publications of the European Communities.

Eurostat (2009): Manual for Air Emissions Accounts. Luxembourg: Office for Official Publications of the European Communities.

Eurostat. (2006): Statistics on the trading of goods - user guide. (No. KS-BM-06-001).

Eurostat. (2010): Quality report on international trade statistics. (No. KS-RA-10-026).

Junius, T., Oosterhaven, J. (2003): The solution of updating or regionalizing a matrix with both positive and negative entries. Economic Systems Research, 15(1), 87-87.

Lahr, M. L., Mesnard, L. de. (2004): Biproportional techniques in input-output analysis: Table updating and structural analysis. Economic Systems Research, 16(2), 115-134.

Leontief, W., Ford, D. (1970): Environmental repercussions and the economic structure: an input-output approach. Review of Economics and Statistics 52(3): 262-271.

Linden, J. A. van der, Oosterhaven, J. (1995): European community intercountry input-output relations: Construction method and main results for 1965-85. Economic Systems Research, 7(3), 249-249.

Miller, R.E., Blair, P.D. (2009): Input-output analysis: Foundations and extensions. Cambridge, UK: Cambridge University Press.

Oosterhaven, J., Stelder, D., Inomata, S. (2008): Estimating international interindustry linkages: Non-survey simulations of the asian-pacific economy. Economic Systems Research, 20(4), 395.

Rueda-Cantuche, J. M., J. Beutel, F. Neuwahl, I. Mongelli and A. Loeschel (2009): A Symmetric Input-Output Table for EU27 - Latest Progress. Economic Systems Research, 21, pp. 59-79.

Stone, R. (1961). Input-output and national accounts. Paris: Organisation for European Economic Co-operation.

Ten Raa , T., Rueda-Cantuche, J.M. (2003): The Construction of Input-Output Coefficients Matrices in an Axiomatic Context: Some Further Considerations. Economic Systems Research, 15, pp. 439-455.

Ten Raa T., Rueda-Cantuche, J.M. (2007): A Generalized Expression for the Commodity and the Industry Technology Models in InputOutput Analysis. Economic Systems Research, 19, pp.99-104.

Ten Raa, T. (2005): The Economics of Input-Output Analysis. Cambridge: Cambridge University Press.

United Nations (1999): Handbook of Input-Output Table – Compilation and Analysis. New York: United Nations.