This article describes the compilation of supply, use and input output tables (SUIOTs) in European countries. A questionnaire was sent in summer 2014 to all EU Member States, Switzerland and The former Yugoslav Republic of Macedonia. The questionnaire was divided in six chapters:

a) organisation;

b) data;

c) process;

d) methodology;

e) dissemination and quality; and

f) applications and satellite systems.

By autumn 2017, 28 countries had responded: Albania, Austria, Belgium, Croatia, the Czech Republic, Cyprus, Denmark, Estonia, Finland, The former Yugoslav Republic of Macedonia, France, Germany, Hungary, Ireland, Italy, Lithuania, Malta, Montenegro, the Netherlands, Poland, Portugal, Romania, Slovenia, Spain, Sweden, Switzerland, Slovakia and the United Kingdom (UK).

Organisation of National Accounts at national level

National statistical institutes (NSIs) or national statistical offices (NSOs) are responsible for compiling National Accounts data for all areas except Balance of Payments statistics and Financial Accounts. The one exception is Belgium\(^1\), where the National Central Bank (NCB) compiles annual and quarterly National Accounts. In Slovakia, the NCB and NSI share responsibility for compiling the quarterly National Accounts. In Austria the quarterly National Accounts is compiled by the NSI and by the Austrian Institute of Economic Research. In Switzerland it is done in cooperation between the NSI and the State Secretariat for Economic Affairs (SECO).

NCBs are usually responsible for Balance of Payments statistics, but in Denmark, Finland, Ireland, Sweden and the UK they are the responsibility of the NSI. In Austria and Malta, the data are compiled in cooperation between NCB and NSI.

In six of the 28 countries (Austria, the Czech Republic, Cyprus, Estonia, Poland and Slovakia), the compilation of Financial Accounts statistics is shared between NSIs and NCBs\(^2\). In 15 countries, the NCB compiles the statistics and in the remaining seven, this is done by the NSIs. With some exceptions, NSIs are generally responsible for compiling SUIOTs. In Belgium supply and use tables (SUTs) are compiled by the NCB, while

\(^1\)In Belgium, the National Accounts are published by the National Accounts Institute, which was set up by law in December 1994. There is cooperation between Statistics Belgium, the Federal Planning Bureau (FPB) and the National Bank of Belgium (NBB). The NBB compiles institutional sector accounts, annual and quarterly National Accounts, regional accounts and SUTs. The FPB is in charge of IOTs and the NSI is in charge of business statistics and collecting survey data for the National Accounts.

\(^2\)In the Czech Republic, the NSI is responsible for annual, and the NCB for quarterly financial accounts.
input-output tables (IOTs) are handled by the Federal Planning Bureau.

Annex 1 (see excel file under Source data for tables, figures and maps (MS Excel) provides a list of contact persons for National Accounts and SUIOTs.

In 27 of the 28 countries, SUTs and IOTs are compiled in the National Accounts department. Figure 1 illustrates how National Accounts work is shared out between the compiling organisations. Annex 2 provides detailed information on the organisations in each country.

Data sources supporting SUIOTs

The data sources for compiling SUIOTs include business surveys, household surveys, administrative sources and company accounts.

Business survey data

Data from annual, quarterly and monthly business surveys can be used simultaneously for compiling SUIOTs. All of the countries use at least one annual business survey to compile SUIOTs, while over half use up to five business surveys.

The annual surveys cited by countries include:

- production statistics survey;
- structural business survey;
- material input and commodity survey;
- purchases of goods and services survey;
- investment survey;
- census data on specific industries;
- financial intermediation activity survey;
- international trade statistics;
- survey on R&D activities; and
- tourism activity survey.

Some countries also use multi-annual surveys, e.g. a five-yearly survey on the structure of intermediate consumption (Slovenia and Hungary), a five-yearly report on the value of materials, energy and services used and stocks of materials (Poland), a four yearly material input and commodity survey (Germany).16 countries use quarterly business surveys, such as:
• trade survey;
  • balance of payments survey;
  • financial sector survey;
  • specific sector survey (e.g. The former Yugoslav Republic of Macedonia, for catering);
  • services producer prices survey; and, more generally
  • short-term statistics survey (turnover, industrial production, producer price indices, etc.); and
  • profits and stock survey.

13 countries use at least one monthly business survey:

• foreign trade statistics;
  • balance of payments survey;
  • turnover survey;
  • PRODCOM survey;
  • consumer price indices;
  • monthly business survey;
  • tourism survey; and
  • producer prices survey.

Business surveys are one source of data for compiling SUIOTs and National Accounts in general. They are based mainly on samples, but some countries have annual census data, e.g. Lithuania (structural business statistics), Ireland (industrial production census), Switzerland (complete inventory of 450 000 businesses) and Portugal (Simplified Business Information covering around 400 000 units). To determine their exhaustiveness, many business surveys have thresholds based on turnover or number of employees. Sample size ranges from one country to another, from a few thousand to 73 000. Annex 3 provides detailed information on surveys used to compile SUIOTs in different countries.

Household survey data

The main annual household survey used to compile SUIOTs is the household budget survey (HBS), cited as the primary source by 17 of the 20 countries that use at least one annual survey. The second most widely used annual source, mentioned by three countries (the Netherlands, Slovenia and UK), are holiday/tourism surveys. The number of households covered by the HBS varies from 865 to 28 000, with a median size of 5 040 and quartiles of 3 500 and 7 000 households. Annex 4 provides details on individual countries’ household surveys.

Administrative data

All countries use administrative data to compile SUIOTs; these include:

• VAT data;
  • annual financial accounts;
  • income tax data;
  • balance of payments;
  • local or central government financial statistics;
  • foreign trade statistics; and
  • social data.

A complete overview of administrative and other sources can be found in Annex 5.

Statistical unit

In response to the question ‘which statistical unit is the basis for the SUTs?’, seven countries said that they used the local 'kind of activity' unit (local KAU) and six the KAU. In 14 countries, SUTs are compiled on the basis of the enterprise unit (see Figure 2).
The total exceeds 24, as eight countries gave multiple responses to the question. The following countries specified two statistical units: Ireland (LKAU and enterprise), Lithuania (enterprise and institutional unit), Malta (KAU and institutional unit), Romania (KAU and UHP), Slovakia (enterprise and institutional unit), Spain (UHP and enterprise), and Sweden (KAU and enterprise) specified two statistical units and the Netherlands specified four (LKAU, KAU, enterprise and others).

Compilation process

Legal framework

Since 2014, SUIOTs in the EU have been compiled and transmitted according to the European System of Accounts (ESA 2010) methodology, which involves the transmission of:

1. annual SUTs;
2. five-yearly IOTs (with a breakdown between domestic production and imports);
3. five-yearly use tables at basic prices (with a breakdown between domestic production and imports); and
4. five-yearly valuations tables (trade and transport margins and taxes less subsidies).

ESA 2010 is binding for EU Member States and EFTA countries, but some other European countries also follow the guidelines. In addition to this supranational legal act, nine countries answered that they are bound also by national requirements.

Classifications

NACE Rev. 2 and the classification of products by activity (CPA) are the classifications most commonly used for compiling SUIOTs. France uses customised national classifications for industries and products.

The classification of individual consumption by purpose (COICOP), the classification of the functions of government (COFOG) and the classification of the purposes of non profit institutions serving households (COPNI) are also used to compile SUIOTs at different levels of detail. Cyprus uses COICOP at five-digit level, eleven

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4 Iceland, Liechtenstein, Norway and Switzerland

5–9 countries have additional national requirements: Austria, Belgium, Croatia, The former Yugoslav Republic of Macedonia, Malta, Poland, Slovakia, Slovenia and Romania.
countries use COICOP at four-digit level, three at three-digit level and three at two-digit level.

In addition, the Combined Nomenclature (CN), the Harmonised Commodity Description and Coding System (HS) and the Broad Economic Classification (BEC) are used for international trade data.

Size of tables

Tables vary as regards numbers of products and industries, but usually go into more detail than the 64 products and 64 industries required under ESA 2010 (see Figures 3 and 4). In many countries, the number of products used for SUTs is much greater than the number of industries: 13 EU countries have more than 250 products and 12 disseminate more detailed tables than required under the ESA 2010 transmission programme. Denmark has the highest number of products (approximately 2 350), followed by Hungary (820), Finland (776), the Netherlands (630), Austria and Poland (both around 550). Slovenia has the largest number of industries (230), followed by Hungary and Finland.

![Figure 3: Level of detail for SUT compilation (products) - Source: NSIs and Eurostat compilation](image)

At the other end of the scale, Croatia, Ireland, Switzerland and The former Yugoslav Republic of Macedonia compile and balance their SUIOTs at less detailed level (49 products and industries in the case of Switzerland; 64 in the case of Croatia). In all countries, compilation and balancing are done at the same level of detail.

As regards IOTs, the number of products is equal to that of industries, except for the Czech Republic and the Netherlands, which have more products than industries. However, in the majority of countries, the IOTs have a much less detailed product breakdown than the SUTs. For example, the Netherlands has 200 products, the Czech Republic 184 and Finland 179 products. Romania is an exception, with about 615 products in its IOTs as compared with 99 in its SUTs.

Frequency

Countries tend to compile SUTs annually and IOTs on an annual or five-yearly basis. As the EU requirement is for five-yearly IOTs, this is not surprising (see Table 1).
Table 1: Overview of compiled tables and their frequency (number of countries) - Source: NSIs and Eurostat compilation

<table>
<thead>
<tr>
<th>Table Type</th>
<th>Quarterly</th>
<th>Annual</th>
<th>Multiannual</th>
</tr>
</thead>
<tbody>
<tr>
<td>Supply Table at basic prices</td>
<td>2</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Supply Table at purchasers prices</td>
<td>1</td>
<td>22</td>
<td></td>
</tr>
<tr>
<td>Supply Table at other price valuation</td>
<td>2</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Use Table at basic prices</td>
<td>13</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Use Table at purchasers’ prices</td>
<td>2</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>Use Table at producers’ prices</td>
<td>1</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>Use Table for domestic at basic prices</td>
<td>13</td>
<td>5</td>
<td></td>
</tr>
<tr>
<td>Use Table for imports at basic prices</td>
<td>1</td>
<td>17</td>
<td>5</td>
</tr>
</tbody>
</table>

The Netherlands and France compile SUTs every quarter. Switzerland compiles them on a three-yearly basis. In Czech Republic SUTs structures are used in quarterly estimates especially for deflation, e.g. shares of use from import or domestic production, shares of output for export and domestic use in commodity breakdown etc.

Timeliness and revision

ESA 2010 requires countries to transmit data to Eurostat within 36 months of the end of the reference period. In practice, deadlines for publishing the SUTs vary from five months in France to 39 months in Poland (see Figure 5). Eight countries (the Czech Republic, Finland, France, the Netherlands, Romania, Sweden, the UK and The former Yugoslav Republic of Macedonia) disseminate their SUTs within two years or a matter of months. Of 26 countries that replied to this question, six (the Czech Republic, France, the Netherlands, the UK, The former Yugoslav Republic of Macedonia and Switzerland) disseminate three versions of their SUTs.

Figure 5: Publication deadlines for SUTs (number of countries) - Source: NSIs and Eurostat compilation

Policies on revising SUTs vary. 16 countries do not revise SUTs after they have been disseminated, while others correct and revise them. In France and the Netherlands, the compilation of SUTs is integrated into the quarterly compilation of National Accounts. France revises its quarterly SUTs in line with its definitive annual SUT.

Key macroeconomic statistics (such as GDP) may be benchmarked against SUTs or vice versa. Similarly, some countries bring SUT data into line with aggregate figures, while others revise the main aggregates on a quarterly or annual basis to bring them into line with SUTs. Austria, the Czech Republic, France and the UK carry out revisions at the level of detail used for compilation. IOTs are revised less frequently, e.g. if SUTs are revised or legal requirements change (such as the switch from ESA 95 to ESA 2010).

Resources
The resources allocated for compiling and balancing SUTs and IOTs vary from nine to 96 person months (see Figure 6).

![Resource allocation for compilation of SUTs and IOTs](image)

**Figure 6: Resources allocated to compilation of SUTs and IOTs (number of countries person-months) - Source: NSIs and Eurostat compilation**

Resource allocation for supply and use differs in line with countries’ traditions and internal working arrangements. It covers a wide variety of situations and the concept of ‘person-month’ has to be interpreted in country specific contexts. In the Czech Republic, France and the Netherlands, for example, where SUTs are integrated in the compilation of quarterly National Accounts data, it is difficult to distinguish the number of months dedicated only to SUTs. Other countries may also include the compilation of IOTs, while some may exclude the balancing process. Also, the fact that some countries revise their tables regularly, while others produce only one final version, influences the number of person months used for SUIOTs.

Of the five countries that allocate more than 36 person-months, three disseminate three versions of their SUTs. There is no direct correlation with the size of the country or the level of detail as regards products and industries in the tables.

**IT tools**

All countries use Excel and other IT tools to compile SUTs and IOTs. 15 use relation databases such as Oracle or Microsoft SQL and 12 use SAS or similar statistical packages. The Czech Republic, Hungary, Slovakia and Slovenia use SNA-NT software developed by Norwegian colleagues to balance their SUTs. Some countries use software developed in house, often based on SAS and Oracle. Some use Matlab, Gauss and GAMS.

**Methodology for SUTs and IOTs**

The ESA 2010 transmission programme requires Member States to transmit:

1. annually:
   - a supply table at basic prices, including conversion into purchasers’ prices; and
   - a use table at purchasers’ prices;

1. on a five-yearly basis:
• an IOT at basic prices (product by product); including sub-tables for:
  • domestic output at basic prices; and
  • imports at basic prices;
• a use table at basic prices;
• a use table for domestic output at basic prices;
• a use table for imports at basic prices;
• a table of trade and transport margins; and
• a table of taxes less subsidies on products.

SUTs at previous year’s prices will have to be transmitted for the first time by the end of 2018 for the 2015 reference year.

**Price valuation and deflation**

All countries compile SUTs at current prices. Although the transmission programme does not require it, 17 already compile tables at previous year’s prices for years prior to 2015 and France compiles additional tables at constant prices. When countries compile SUTs in volume terms, almost half use the same level of detail as for SUTs at current prices. The only exception is Switzerland, where the current-price table is compiled at more aggregated level (49 products and industries) than that at the previous year’s prices (54).

The price deflators used by countries vary. They include: the producer price index (PPI), the consumer price index (CPI), unit value indices (UVIs), the services producer price index (SPPI), the import price index (IPI), the export price index (EPI), construction and agricultural price indices and implicit price deflators. In France, some prices are also observed at the level of intermediate consumption.

Of the 27 countries, 19 use the double deflation method to derive gross value added in volume terms. In France and in Portugal National Accounts, production in constant prices minus intermediate consumption in constant prices must be consistent with the sum of final expenditures in constant prices (as SUIOTs are calculated entirely at current and previous years’ prices). In Germany, SUTs at current prices are used to calculate the weightings for deflation of output and intermediate consumption.

Valuation matrices (taxes less subsidies and transport and trade margins) are compiled more frequently (annually for the most part) than the required five yearly intervals. Many countries also compile the various layers annually: non-deductible VAT (21 countries), taxes on products excluding invoiced VAT (19), subsidies on products (20), transport margins (19) and retail and wholesale trade margins (17).

**Balancing process**

The compilation of SUTs involves ‘data confrontation’, a balancing process ensuring that all key identities in the SUT framework are consistent.

Countries may use an automatic or manual procedure only or combine both approaches. In practice, 27 use manual balancing and 20 also use automatic procedures, including four (Germany, Italy, the Netherlands, Spain and Switzerland) that balance 90% of cells or more in this way. Many countries that use manual balancing solve large balancing issues manually, sometimes for virtually all cells. Remaining issues are then solved by an automatic procedure such as RAS or the Stone, Champernowne and Meade (1942) approach.

Manual balancing involves significant human resources and may be very time consuming. For example, in the UK, it takes eight full-time equivalent SUT staff and around 10 seconded Office for National Statistics staff about six weeks, until almost the end of the process, when an RAS algorithm is performed to remove final, minor imbalances. Depending on a country’s organisational arrangements, balancing involve a number of persons devoting part of their time to the task, but in at least six countries just one or two staff members are involved.

**Other methodological issues**

SUTs bring together the components enabling compilation of the GDP measure via three approaches (production, income and expenditure approach). One of their main purposes, when balanced, is to provide a single
estimate of GDP. However, not all countries use SUTs in line with the three approaches. Use of national SUTs to measure GDP according to the income and production approaches may differ as regards the timing of the calculation. Five countries (the Czech Republic, Italy, The former Yugoslav Republic of Macedonia, the Netherlands and Sweden) use the supply and use framework for the first GDP estimate. In Poland and Slovakia, it is used for the second estimate.

As surveys and other data sources do not always provide complete information, 15 of the 24 countries use different methods to treat missing data. Four (Denmark, Estonia, Slovenia and the UK) use forecasting and seven (Denmark, Poland, Romania, Slovakia, Slovenia, Sweden and the UK) use backcasting. Some mentioned other techniques, e.g. updating multi-annual survey results (Slovenia and Hungary).

Of the 24 countries, 15 compile regional/provincial accounts that are consistent with national SUTs using the same framework. The regional accounts are mostly compiled at NUTS 3 level and the industry breakdown is at NACE A10 level.

As regards imports in the supply table, all countries compile these in CIF valuation and 18 also adjust them to FOB valuation. 21 are able to split their import data and provide more details, in the majority of cases showing an intra/extra EU import breakdown and a further intra/extra euro area breakdown.

Many countries compile additional tables to support the use table, e.g. final consumption by type of product (COICOP or COFOG), and gross fixed capital formation by type of product and industry. These tables are often not released publicly, but used as internal input for supply and use compilation.

Responses to the question on goods sent abroad for processing show that 23 countries take a net approach to this measure, while five take a gross approach. The UK compiles estimates based on both approaches.

18 countries produce IOTs annually, six on a five-yearly basis and Switzerland every three years. 21 compile ‘product by product’ tables and nine compile ‘industry by industry’ tables. Four (Belgium, the Czech Republic, Hungary and Italy) produce both types of table. IOTs are often the result of a transformation model run on the SUTs. Most countries derive IOTs on the basis of the ‘product technology’ assumption, whereby each product has its specific technology irrespective of the industry that produces it. Nine use the ‘fixed product sales structure’ assumption and some also use the hybrid assumption.

**Dissemination and quality**

Under confidentiality rules applying to SUTs and IOTs, not all countries can disseminate full tables. Ten countries apply confidentiality rules, which cover between 0.3 % (Sweden) and 5 % of the cells (Poland).

16 countries assess the quality of their tables on the basis of national codes of practice or the European Statistics Code of Practice. 11 countries indicated that they analyse users’ needs on the basis of informal contacts or via internet etc. However, user surveys are not carried out on a regular basis and the results are normally not publicly available.

Under the ESA2010 transmission programme, countries transmit their SUIOTs to Eurostat and many other users, such as policy analysis bodies, universities, research institutes, national banks, local and international organisations and (in particular, finance) ministries. The SUIOTs may be transmitted to other users (e.g. students, journalists, etc.) in response to ad hoc requests.

The majority of countries make documentation on SUTs and SUIOTs publicly available. Annex 6 contains a list of links to useful country documentation.

**Applications and satellite accounts**

Many countries compile various applications of tables and satellite accounts. This is not always done by NSIs only: research institutes or ministries cooperate with NSIs or compile them independently. Annex 7 provides an overview of work done in different countries.
Source data for tables and graphs

- [Download Excel file](#)

Data sources
The data presented here are based on a questionnaire addressed to European Member States in 2014. Data have been compiled during the year 2015.

Context
With the change over ESA 2010 methodology in September 2014 it was interesting to collect information on the compilation of Supply, Use and Input-Output Tables. Eurostat is thankful to all Member States replying to its request.

Other articles

- [Consolidated supply, use and input-output tables](#)

Tables

- [ESA Supply, use and Input-output tables](#)

Database

- [ESA Supply, use and Input-output tables](#)

Dedicated section

- [ESA Supply, Use and Input-output tables](#)

Legislation

[Regulation 0549/2013](#) of 26 June 2013 on the European system of national and regional accounts in the European Union

External links

- [International Input-Output Association (IIAO) - IIAO newsletters](#)