



## METHODOLOGICAL EXPLANATION

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# INPUT-OUTPUT TABLES, SUPPLY AND USE TABLES

This methodological explanation relates to the data releases:

Supply and use tables, input-output tables, Slovenia, annually (First Release)



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## 1 PURPOSE

Supply and use tables and the symmetric input-output tables are a part of the input-output system, which is an integral part of national accounts. The purpose of the release of the tables is the description of the domestic production process and transactions in products of the domestic economy in great detail. The tables create a breakdown of goods and services account, production account and generation of income account in the system of national accounts. They show the structure of production, costs of production and incomes generated in the process of production, flows of goods and services produced within the domestic economy and flows of goods and services with the rest of the world. Published data are shown at current and at constant previous years prices.

The requirements in the European system of national and regional accounts ESA 1995 and ESA 2010 for the EU Member States define yearly compilation of supply and use tables and every five years symmetric input-output tables. The requirements in ESA 2010 define every five years also compilation of additional tables (table of net taxes on products, table of trade and transport margins, use table at basic prices, use table for imports, use table for domestic output). The deadline for transmission of the tables for an individual year is three years after the end of the period.

## 2 LEGAL FRAMEWORK

- [Annual Programme of Statistical Surveys \(LPSR\)](#) (*only in Slovene*)
- [National Statistics Act](#) (OJ RS, No. 45/95 and 9/01)
- Regulation (EU) No 549/2013 of the European Parliament and of the Council of 21 May 2013 on the European system of national and regional accounts in the European Union (CELEX 32013R0549).

## 3 UNIT DESCRIBED BY THE PUBLISHED DATA

The unit described by the published data is transactions of economic actors which are active on the Slovenian territory and are grouped into activities. Transactions are observed from the point of view of production and generation of value added and incomes by individual activities (output, intermediate consumption, value added components), supply (output and imports) and use of products on the domestic market (intermediate consumption, final consumption, capital formation, exports).

## 4 SELECTION OF OBSERVATION UNIT

Institutional units of all sectors in the economy.

The calculation covers all activities following the concept of production by the System of National Accounts (SNA) and the European System of Accounts (ESA).

## 5 SOURCES AND METHODS OF DATA COLLECTION

Data are collected annually.

For the compilation of the tables, we use the data from statistical surveys carried out by the Statistical Office and from administrative sources. We use data from statistical surveys of agriculture and forestry (economic accounts for agriculture (EAA), economic accounts for forestry (EAF) and other data from agricultural statistics), manufacturing (IND-L), construction (GRAD-L), trade (TRG-L), transport (TR-ŽEL/L, TR-LET/L, TR-CES/L, etc.), research activity (R-RD), investments (INV-1, INV-2), the Household Budget Survey, energy statistics, tourism statistics, statistical surveys of prices, national accounts statistics, data on imports and exports of goods from external trade statistics, data on employment from the Register of Employment (SRDAP), and data from the Business Register (PRS). For the compilation of the tables, the survey on the structure of costs of materials and services and the structure of output is carried out every few years (NR-IOT). The results are recalculated to the interim years and supplemented by data from regular yearly statistical sources.

Administrative sources include data from accounting statements and balance sheets of enterprises and other organisations which are acquired from Agency for Public Legal Records and Related Services (AJPES) and data on taxes, data of unincorporated enterprises and data from the government financial statistics which are acquired from Public Payments Administration (UJP), Financial Administration (FURS) and Ministry of Finance (MF). Furthermore, we use data from the balance of payments of Bank of Slovenia on imports and exports of services.

The basis for the compilation of tables at constant previous year prices is supply and use tables at current prices. For deflators price indices from statistical surveys, conducted by SURS (consumer price indices, output price indices, import price indices, external trade unit value indices, services producer price indices, agricultural input price indices, prices of energy products) and other organisations in the field of prices are used. In some cases, where direct price indices are not available or where this is more appropriate, implicit price indices on the basis of quantity indicators of growth in volume from statistical surveys conducted by SURS and other organisations are used for deflation.

## 6 DEFINITIONS

**Output** is value of goods and services produced within the production unit from the beginning to the end of the year. It includes production for the sale on the market, production for own final use and other non-market production (of

government, non-profit institutions serving households – NPISH). It is valued at basic prices.

**Basic price** is the amount receivable by the producer from the purchaser for a unit of a good or service produced as output minus any tax on product payable, and plus any subsidy on product receivable referring to that unit.

**Purchasers price** is the amount actually paid by the purchaser for a unit of a good or service. It differs (is higher) from the basic price for the value of trade and transport margins and net taxes (taxes less subsidies) on products.

**Taxes on production and imports** consist of two major categories: taxes on products and other taxes on production. **Taxes on products** are taxes which are paid per unit of particular good or service and are paid when goods are produced, sold or imported (sales taxes, excise duties, import duties and other special taxes on products and transactions). **Other taxes on production** cover taxes on production, payable irrespective of the quantity or value of production.

In the same way as taxes also subsidies are divided into two major categories: subsidies on products and other subsidies on production. **Subsidies on products** are subsidies which are paid per unit of good or service. They can be paid when the good or service is produced, sold or imported. **Other subsidies on production** consist of other subsidies enterprises can get from the government as a consequence of engaging in production. Subsidies are considered as negative taxes.

**Trade margins** are the value of output of wholesale and retail traders. They are the difference between the price realised on a good purchased for resale and its purchasing or replacement value. In the use table, where the flows are shown at purchasers prices, trade margins are included by the uses of individual types of products. In the tables where the flows are shown at basic prices, trade margins are separated from these flows and shown in the rows for trade services.

**Transport margins** are the value of transport costs paid separately by the purchaser and included in purchasers price, but not also in basic prices of manufacturer or in trade margins of wholesale or retail trader. In the same way as by trade margins, in the use table, where the flows are shown at purchasers' prices, transport margins are included by the uses of individual types of products. In the tables where the flows are shown at basic prices, transport margins are separated from individual flows and shown in the rows for transport services.

**Intermediate consumption** is the value of goods and services used as inputs into the process of production within the production unit. It does not include the use of fixed capital. It is valued at purchasers prices.

**Value added at basic prices** is equal to output at basic prices less intermediate consumption at purchasers prices. It is composed of compensation of employees, other net taxes on production, consumption of fixed capital and net operating surplus, which is the residual category.

**Final use** is the sum of final consumption expenditures of individual institutional sectors, gross capital formation and exports.

**Final consumption expenditures of individual institutional sectors** are composed of expenditures for final consumption of households, non-profit institutions serving households (NPISH) and government.

**Gross capital formation** comprises gross fixed capital formation, net acquisitions of valuables and changes in inventories (of products, unfinished production, materials, trading goods).

**Supply** is the sum of domestic output and imports.

**Use** is the sum of intermediate consumption and final use.

Concepts and definitions are the same as in the rest of the system of national accounts.

## 7 EXPLANATIONS

### 7.1 CLASSIFICATIONS

Data are shown according to the Standard Classification of Activities (SKD) and Classification of Products by Activity (CPA).

More information about classifications is available on:

<http://www.stat.si/StatWeb/en/Methods/Classifications>

In line with ESA 1995 and ESA 2010 definitions, for the tables with the reference year until 2007 the classification used for industries is NACE Rev. 1 (Slovene version SKD 2002 - Standard Classification of Activities) and for products CPA 2002 (Slovene version CPA 2002 - Classification of Products by Activity). For the tables with the reference year 2008 and on, the classification used for industries is NACE Rev. 2 (Slovene version SKD 2008 - Standard Classification of Activities) and for products CPA 2008 (Slovene version CPA 2008 - Classification of Products by Activity). These two classifications are completely harmonised: at all levels of aggregation the CPA shows main products of activities according to NACE Rev. 1. The tables are published at the level of 60 (for tables with the reference year until 2007) or 64 (for tables with the reference year 2008 and on) industries and groups of products, as it is the requirement of Eurostat for EU Member States. By the compilation of tables the level of detail is greater as much as it is possible for individual parts due to available data sources.

### 7.2 DATA PROCESSING

#### DATA EDITING

Data were edited by using appropriate systematic and individual corrections.

For more, see the general methodological explanations [Statistical data editing](#).

## WEIGHTING

Weighting was not performed.

## SEASONAL ADJUSTMENT

Seasonal adjustment is not applicable.

## 7.3 INDICES

Indices are not published.

## 7.4 PRECISION

The precision is not calculated.

## 7.5 OTHER EXPLANATIONS

### Contents of the tables

**Supply and use tables and symmetric input-output tables** are matrices describing the domestic production process and transactions in products of the domestic economy in great detail. They create a breakdown of goods and services account, production account and generation of income account in the system of national accounts. They show the structure of production, costs of production and incomes generated in the process of production, flows of goods and services produced within the domestic economy and flows of goods and services with the rest of the world. The starting point is supply and use tables, which are constructed on the basis of the data from different statistical sources. From them the symmetric input-output tables are then derived.

A **supply table** shows the supply of goods and services by products and by type of producers for domestic production and distinguishing separately imports by products. In columns it has individual domestic production activities and imports, while in rows it has individual groups of goods and services. It is compiled at basic prices, followed by additional columns for the transition to purchasers' prices. From individual columns in the left part of the table it is evident what value of individual products is produced by particular industry and what is the total value of production of this industry. Columns in the right part of the table then show the structure of imports, margins and net taxes according to individual types of goods and services. In the end, the addition to imports for individual purchases of residents abroad and CIF/FOB adjustment of imports is added. Final aggregates in the supply table show total value of domestic output, imports and supply at basic and at purchasers' prices in the whole economy.

A **use table** shows the use of goods and services by type of products and by type of use, i.e. as intermediate consumption (by industries), final consumption, gross capital formation and exports. Furthermore, the table shows the

components of value added: compensation of employees, other taxes less subsidies on production, consumption of fixed capital and net operating surplus. As the supply table, it has individual activities in columns and individual groups of goods and services in rows. It is compiled at purchasers' prices. Then it is transformed to basic prices with the support of taxes less subsidies tables and margins tables. Individual columns in the left part of the table show the structure of intermediate consumption of particular industry by the types of products and the structure of value added of this industry. Columns in the right part of the table show the structure of categories of final use by types of goods and services. In the table the rows for adjustments for individual purchases of residents abroad and non-residents at home and the row for CIF/FOB adjustment are added. Purchases of residents abroad are in the value of business purchases included in the intermediate consumption and in the value of private purchases they enlarge final consumption expenditure of households. Purchases of non-residents at home lower final consumption expenditures of households and enlarge exports. Final aggregates in the use table show total value of production, intermediate consumption, value added, elements of value added and categories of final use for the whole economy.

Industries, shown in columns, are in the prepared supply and use tables defined as groups of enterprises with the same principal activity. In this way industries are to some extent more heterogeneous than if we used the "kind of activity units" (KAU) approach recommended by ESA. However, this approach is more difficult to perform. We have decided for this approach because of the deficiencies of available data sources.

There are two identities between supply and use tables:

- identity by industry: output by industry = inputs by industry; thus the sums of individual columns are the same in both tables;
- identity by product: total supply by product = total use by product; thus the sums of individual rows are the same in both tables.

**Table of net taxes on products** shows allocation of taxes on products, diminished for the subsidies on products, across individual types of uses. As the supply and use tables it has activities in the columns and groups of goods and services in the rows.

**Table of trade and transport margins** shows allocation of trade and transport margins across individual types of uses. It has as well activities in the columns and groups of goods and services in the rows.

**Use table for imports** shows the use of imported products in individual activities and types of final uses. It has industries classified in the columns and groups of products classified in the rows. Data are shown in CIF values, which correspond to the valuation at basic prices. In order to ensure proper total valuation of imports in FOB values, the CIF/FOB adjustment is added.

**Use table for the domestic output** is achieved as the difference between the use table at basic prices and the use of imports table. It shows uses of individual products originating from domestic production, according to individual industries and types of final uses.



**Symmetric input-output table** is a matrix which employs the same classification in columns and rows, i.e. product or industry. The essential difference between the supply and use tables and the symmetric input-output table is therefore that the former tables relate products to industries and the latter table relates products to products or industries to industries. We can therefore construct two types of symmetric input-output tables: product by product or industry by industry. In input-output analysis product by product table has the primary role. It shows more homogenous flows and also we have elaborated it. It describes technological relations between productions of individual products. Columns in the left part of the table show for each product values of individual products and services used as inputs into their production and in the lower part the composition of value added generated by the production of this product. Columns in the right part of the table show in the same way as in the use table the composition of individual types of final uses by products.

In the symmetric input-output table there exists identity between rows and columns: the value of supply of individual product shown in the column is equal to the value of use of this product shown in the row.

A symmetric input-output table is elaborated with the conversion of supply and use tables valued at basic prices. It is necessary to rearrange outputs and inputs from the industries where they are actually produced or used to the "homogenous branches", i.e. branches which produce only one type of product. This is performed by the use of assumptions and mathematical methods and if additional statistical information is available, it is used. Assumptions base on two types of technological assumptions:

- product technology, assuming that all products in a product group have the same input structure, whichever industry produces them, or
- industry technology, assuming that all products produced within an industry are produced with the same input structure.

The choice of assumption depends on the characteristics of domestic industries, this means on the homogeneity of production technologies used within individual product group or individual industry. We have decided for the use of the product technology assumption, which we considered more realistic and which is also compatible with the product by product type of table.

It follows the breakdown of the symmetric input-output table to imported and domestic flows. Symmetric use of imports table shows the uses of imported products, whereas symmetric input-output table for domestic production shows the uses of domestically produced products.

### **Compilation of the tables at current prices**

The starting point for the preparation of the supply table is **data on output** from individual branch statistical surveys. Data are adjusted to the definitions of ESA, completed for coverage and reconciled with the data on output from administrative sources. Data for service activities which are not covered with statistical surveys are acquired from administrative sources. These data are supplemented with the data about the structure of output of enterprises, which are calculated on the basis of a special survey which is carried out for the

construction of tables every few years. In this way we are able to separate also other secondary activities, in particular services which are carried out by enterprises. Data on output of household units which are not covered with statistical surveys are based on administrative sources. By this we consider adjustments for coverage of units and transactions elaborated within the national accounts. In the table we consider data from economic accounts for agriculture and calculation of output for the financial sector, non-profit institutions and general government sector compiled in national accounts.

**Data on imports and exports** of goods are acquired from external trade statistic and data on imports and exports of services and on cif/fob adjustment from balance of payments of the Bank of Slovenia. The calculation of **trade margins** on products is based on the data from financial statements of enterprises on sales and acquisitions of goods for resale and on the basis of the data from trade statistics on turnover according to commodity groups and types of trade. The calculation of **transport margins** is based on the data from transport statistical surveys, supplemented with other sources about performed transport services and transportation according to product groups. **Data on taxes on products** comprise import taxes, value added tax, excise duties and other taxes on products. Data on **import taxes** according to products are acquired from data from external trade statistics. Calculation of **value added tax** according to product groups is the result of the elaboration of taxes table, where the tax is calculated taking into account the prescribed tax rates and taxable purchases (intermediate and final) and reconciled with the data from tax records. **Data on other taxes on products** are acquired from tax records and they relate to specific products. **Data on subsidies on products** are the estimation of national accounts on the basis of government financial statistics and data from financial accounts of enterprises.

The main data source for the calculation of detailed **intermediate consumption** by products in the use table is a special statistical survey carried out every few years and supplemented by available regular yearly administrative and other sources, which are predominantly more aggregated. The basis for the assurance of full coverage of intermediate consumption and for the calculation of elements of value added is administrative sources, with the adjustments on the concepts of national accounts. Data on **final consumption of households** derive from the Household Budget Survey, trade statistics and additional calculations done within national accounts. The main source for **capital formation** is the statistical survey on fixed capital formation, supplemented with additional calculation in national accounts. Data on **final consumption expenditures by government and non-profit institutions** are calculated within the compilation of GDP by expenditure approach.

On the basis of the data from external trade statistics and the balance of payments the **use of imports table** was compiled.

**Symmetric input-output tables** are elaborated with the mathematical transformation of the supply and use tables on the basis of the product technology assumption which is in some cases supplemented with the industry technology assumption.

### **Compilation of the tables at constant previous years prices**

Compilation of **supply and use tables at constant prices** means separation of flows and aggregates from the tables at current prices into volume and price changes. Tables at constant prices register only changes in volumes compared to the previous period; the impact of changes in prices of goods and services is eliminated. By compilation of reconciled tables at current and constant prices for two or more years we can calculate growth rates and implicit deflators of individual flows of goods and services and of individual national accounts aggregates, among them also the most important value added and GDP. In line with the rules of ESA 1995 and ESA 2010 the tables are compiled at previous year prices.

Supply and use tables provide with detailed data by products and industries a good and consistent framework for the calculation and balancing of national accounts aggregates at constant prices. Deflation is carried out at the detailed level of goods and services. Flows of goods are deflated at basic or producers prices to which price indices refer; in this way they are not affected by the changes of taxes and margins rates. Margins and taxes are deflated separately and then incorporated as the part of purchasers price. The exceptions are final consumption of households and exports; they are deflated also directly at purchasers prices to which available price indices refer. At the level of individual groups of goods and services the same price indices at basic prices are used for all flows, which enables consistency of used indices at the supply and use side.

For the **deflation of market output**, weighted price indices of goods and services for domestic market and export are used. For the products for domestic market, producer price indices for manufacturing products and agriculture are used and in some cases implicit price indices calculated on the basis of quantity indicators of growth of output. For services, direct producer price indices, consumer price indices and retail price indices are used, for construction indices of construction costs, and for some services implicit price indices on the basis of quantity indicators of growth of output.

For calculation of **non-market output of education and health** at constant prices, the output method is applied, which uses quantity indicators of growth of output. For deflation of other non-market output the input method is used, where there are in analogy with the calculation of output of non-market products at current prices (on the basis of values of inputs in their production) deflated individual components of output (detailed intermediate consumption by products and components of value added). On this basis implicit deflators of output for individual groups of non-market products are calculated.

For **deflation of exports of goods**, producer price indices for foreign market are used, which are in some cases supplemented with export unit value indices from external trade statistics. For the deflation of imports, import price indices are used supplemented with import unit value indices from external trade statistics. Because direct price indices for export and import of services are not available, consumer price indices for Slovenia and EU Member States are used.

**Domestic use** (intermediate consumption, final consumption expenditures of households, NPISG and government, gross fixed capital formation, changes of inventories) is by individual groups of goods and services deflated with weighted indices from domestic production and imports at the level of basic

prices and then calculated to purchasers prices. Final households consumption expenditures are directly deflated also at the level of purchasers prices, where consumer price indices are used.

**Taxes and subsidies on products and trade and transport margins** at constant prices are calculated by the use of previous year rates and uses of goods and services at constant prices (at basic values). In this way taxes, subsidies and margins are calculated from the use side and then transferred also to the supply side.

**Value added at constant prices** is received as the difference between the value of output at constant prices and the value of intermediate consumption at constant prices, i.e. by the double deflation method. The double deflation method is the most appropriate and recommended method for the calculation of value added at constant prices. Supply and use tables are because of calculation at the detailed flows of goods and services a recommended framework for its performance.

## 8 PUBLISHING

- SiStat Database: [GDP and national accounts](#) – Supply and use tables, input-output tables. Data are published yearly, in absolute values at current prices and at constant previous year prices.
- First Release (GDP and National Accounts, Supply and use tables, input-output tables): »Supply and use tables, input-output tables, Slovenia«.
- EUROSTAT (Statistical Office of the European Union)

## 9 REVISION OF THE DATA

### 9.1 PUBLISHING OF PRELIMINARY AND FINAL DATA

Revision policy of national accounts is stipulated with ESA 2010, so data are not determined the status of preliminary or final.

Supply and use tables and input-output tables data are for year t published in t + 24 months and are afterwards not revised.

### 9.2 FACTORS INFLUENCING COMPARABILITY OVER TIME

Data in tables until 2007 inclusive are shown according to SKD 2002 and CPA 2002 classifications. Data in tables from 2008 on are shown according to SKD 2008 and CPA 2008 classifications.

According to ESA requirements, tables published until September 2014 were constructed in line with ESA 1995 methodology and from that time on in line with ESA 2010 methodology. Thus, tables until 2010 inclusive are compiled

according to ESA 1995 methodology and from 2010 on according to ESA 2010 methodology (tables for 2010 are compiled and published according to both methodologies).

### **Changes with the introduction of ESA 2010 methodology**

The ESA 2010 methodology has introduced changes in 25 areas, but two changes had the most important impact on Slovenian national accounts aggregates and supply and use tables: capitalizations of expenditures on research and development and changed treatment of imports and exports of goods for processing and merchanting abroad.

Expenditures on research and development are no longer treated as intermediate consumption in production processes, but as capital formation. Also own-account research and development is treated as output and capital formation. These changes lowered the intermediate consumption and increased output, consumption of fixed capital, value added, capital formation and gross domestic product.

Goods for processing are no longer included in imports and exports of goods, since the new treatment of imports and exports of goods takes into account only goods involving the change of ownership. Thus, only the processing service is included and with this the value of imports and exports is lowered, but net balance remains the same. Imports of goods for processing are also no longer included in the value of output and intermediate consumption of enterprises. With the new treatment, there is a difference to the data on imports and exports of goods in the external trade statistics, where goods for processing are still included.

Changed treatment of merchanting of goods means that sales and purchases of these goods are due to the change of ownership included in the flows of exports and imports (as export and negative export). Thus, there is no change in the value of exports, but the presentation is changed; it is no longer by services, but by goods. In the supply and use tables, trade margins are increased and the intermediation service is decreased.

## **10 OTHER METHODOLOGICAL MATERIALS**

Methodological materials on SURS's website are available at <https://www.stat.si/statweb/en/Methods/QuestionnairesMethodologicalExplanationsQualityReports>.

- European System of Accounts ESA2010 <http://ec.europa.eu/eurostat/documents/3859598/5925693/KS-02-13-269-EN.PDF/44cd9d01-bc64-40e5-bd40-d17df0c69334>
- [Building the System of National Accounts](#)